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The 2015 Eastern Bering Sea Continental Shelf Bottom Trawl Survey: Results for Commercial Crab Species

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The 2015 Eastern Bering Sea Continental Shelf Bottom Trawl Survey: Results for Commercial Crab Species

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ABSTRACT

The eastern Bering Sea bottom trawl survey has been conducted annually since 1975 by the Resource Assessment and Conservation Engineering Division of the Alaska Fisheries Science Center, National Marine Fisheries Service. The purpose of this survey is to collect data on the distribution and abundance of crab, groundfish, and other benthic resources in the eastern Bering Sea. These data are used to estimate population abundances for the management of commercially important species in the region. This document includes the time series of results from 1975 to the present. ***The historical annual abundance and biomass estimates were recalculated with changes in which tows were included, the size-weight regressions used for biomass, and the criteria used for defining maturity. As a result, the historical estimates presented in this document may be different from previous year's documents.*** In 2015, 375 standard stations were sampled on the eastern Bering Sea shelf. The biomass estimates, reported in metric tons (t) and pounds (lb) with 95% confidence intervals (± 1.96 SE) for legal-sized males of each commercial crab stock in the eastern Bering Sea, were as follows:

Commercial crab species	2015 legal or preferred-sized male biomass (± 95% CI)	
	t*	lb**
Bristol Bay District red king crab (*Paralithodes camtschaticus*)	27,209 (9,612)	59,986,236 (21,190,163)
Pribilof District red king crab	14,788 (21,553)	32,602,249 (47,515,393)
Pribilof District blue king crab (*P. platypus*)	428 (385)	944,152 (848,269)
St. Matthew Is. Section blue king crab	3,592 (5,468)	7,918,572 (12,054,161)
Southern Tanner crab (*Chionoecetes bairdi*), east 166° W	22,853 (6,247)	50,382,779 (13,772,219)
Southern Tanner crab, east 166° W ≥ 4.9 inches	19,301 (5,771)	42,551,411 (12,723,866)
Southern Tanner crab, west 166° W	27,067 (8,461)	59,673,140 (18,653,337)
Southern Tanner crab, west 166° W ≥ 4.9 inches	14,306 (5,040)	31,538,412 (11,111,353)
Snow crab, all Districts (*C. opilio*)	71,550 (16,480)	157,741,107 (36,331,511)
Snow crab, all Districts ≥ 4.0 inches	35,838 (12,682)	79,009,168 (27,958,335)

*Estimates for preferred size classes are those with sizes listed in the left column.

**Biomass estimates in pounds were derived by converting the raw length data to pounds prior to calculating the area swept estimates.

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INTRODUCTION

Survey History and Purpose

The eastern Bering Sea (EBS) bottom trawl survey has been conducted by scientists in the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC), National Marine Fisheries Service (NMFS) since the early 1970s. Starting in 1975, surveys were conducted annually and were expanded beyond Bristol Bay to include the majority of the Bering Sea continental shelf with the original purpose of assessing potential resource impacts of offshore oil development (Pereyra et al. 1978). The annual collection of data on the distribution and abundance of crab and groundfish resources provides fishery-independent estimates of population abundances and biological data for the management of commercially important species in the EBS. The crab species that have historically been assessed during the survey because of their commercial importance include: red king crab (*Paralithodes camtschaticus*), blue king crab (*P. platypus*), southern Tanner crab (*Chionoecetes bairdi*), snow crab (*C. opilio*), and hair crab (*Erimacrus isenbeckii*). The common name for *C. bairdi* changed from Tanner crab to southern Tanner crab in 2005 (McLaughlin et al. 2005) but it will still be referred to as Tanner crab in this document.

Prior to 1988, the total number of stations varied and gradually increased until they were standardized in 1988 (Fig. 1). Therefore, the pre-1988 estimates provided in this document for stocks that extend northwest of the Pribilof Islands are biased as the entire stocks were not sampled. Since 1988, 376 standard stations have been included in the survey approximately covering 140,350 square nautical mile (nmi^2) area of the EBS with station depths ranging from 20 to 200 m (Fig. 2). The annual EBS bottom trawl survey begins in the northeast section of Bristol Bay in early June and approximately 4 to 6 stations are sampled each day from each of two vessels. The standard survey is completed in late July or early August at the western edge of the survey grid, northwest of St. Matthew Island. In some years when the reproductive cycle of red king crab is delayed due to colder water temperatures (i.e., 1999, 2000, 2006-2012), a small portion of the inner Bristol Bay area is resampled after the conclusion of the standard survey (see Methods).

Revision to the Historical Annual Abundance and Biomass Estimates in the Time Series

In this document, we present a new time series with recalculated abundance and biomass data for each year of the time series. ***In the new time series, we reconsidered which tows to include, the length-weight regression used to calculate biomass, and the criteria used to determine maturity status.*** The changes resulted in differences in abundance and biomass estimates (e.g., Figs. 3 and 4).

To determine which tows to include at each station throughout the time series, we considered spatial coverage, tow density within a station, and tow duration. To increase the spatial coverage of the survey and increase sample size, particularly in the early years (pre-1988), tows from supplemental studies were included. Gear type, tow duration, and timing (season) of the supplemental tows were similar to those in the standard survey. To standardize the number of

tows in any station so as to reduce bias in the estimates, only one tow was considered at each station. Previously, additional tows that were conducted at stations with ≥ 100 legal-sized red king or Tanner crab ("hot spots"), were included in the abundance estimates. Also, because station Z-04 has a limited area within a trawlable depth range, tows were often completed at the northeast corner of station Z-04 (AZ-0504). We now exclude station Z-04 (AZ-0504) for crab population estimation. Thus 375 stations are used for crab analysis rather than 376 as listed in previous technical reports. The new time series data does not include any previously included tow in the annual estimates that was not targeted to be 30 minutes (with the exception of 1975), was towed outside the May-August timeframe, or was sampled with gear other than the standard survey gear.

Previous to this document, abundance to biomass conversions for the years 1975-2009 were based on weight-size relationships that were established from limited data (< 500 samples for all species) and estimates from survey data total weights. In 2010, the weight-size relationships were revised based on maturity status (ovigerous and non-ovigerous) and species-specific length and weight data (> 1,000 measurements) collected during EBS surveys from 2006 to 2010. As such, reports during 2010-2014 calculated biomass using older weight-size relationships for the 1975-2009 data and the new weight-size relationships for the 2010-2014 data. Starting with this document (2015) the new regression factors were applied for all years in the time series (1975-2015). Additional length and weight data collected on the survey annually will be used to assess relative changes to the relationship over time and will be correlated with environmental variables.

Previous to this document, female maturity was defined by specific carapace size classes (i.e., a size cut-line), defined by the State of Alaska harvest regulations for each stock. To more accurately present maturity in this annual document, female maturity is now defined by abdominal flap morphology and egg presence (i.e., "actual maturity"). Estimates for mature females were updated using actual maturity for all years in the time series (1975-2015).

Eastern Bering Sea Crab Stock Assessment Process

Crabs included in the federal Bering Sea and Aleutian Islands (BSAI) King and Tanner Crab Fisheries Management Plan are managed by the Alaska Department of Fish and Game (ADF&G) with federal oversight by NMFS (NPFMC 2011a). The annual stock assessment and fishery evaluation (SAFE) report prepared by the North Pacific Fishery Management Council provides current biological, ecosystem, and economic data associated with these species. The NMFS determines the procedure for setting overfishing levels and allowable biological catch while ADF&G sets the annual total allowable catch or guideline harvest level for each crab stock. Currently, the Crab Plan Team and the Council's Scientific and Statistical Committee review the assessment, biological, economic, and modeling data to recommend biological reference points associated with the status of crab stocks. Crab stock boundaries are defined by ADF&G management units for king crab and Tanner crab species (Fitch et al. 2012); however, the Pribilof Islands blue king crab stock boundary also includes a 20 nmi column on the east side of the management unit, which was added in 2013 to account for blue king crab bycatch. Red king crab are split into Bristol Bay and Pribilof Islands stocks and blue king crab are split into Pribilof

Islands and St. Matthew Island stocks for management purposes, while Tanner and snow crab fisheries are considered single stocks but are split into separate management fishery units defined by the ADF&G Board of Fisheries using 166° W and 173° W as the boundary for each east and west unit, respectively.

This report summarizes the 2015 survey results for commercially important crab resources in the EBS. Note that area-swept estimates in this document are indices of abundance and may not match the final modeled population estimates in the SAFE reports because the models include additional population dynamics information. The results of the 2015 standard EBS bottom trawl survey are presented for these crab stocks as defined by the management units. Details of the survey design and fishing gear specifications in addition to the number and weights of the groundfish species sampled at each standard station during this survey will be reported in a separate NOAA Technical Memorandum (e.g., Lauth and Nichol 2013).

METHODS

Survey Area and Sampling Logistics

The 2015 standard survey was conducted onboard the chartered fishing vessels FV *Alaska Knight* and FV *Vesteraalen*, beginning 2 June in the northeast corner of Bristol Bay, moving westward, and finishing on 29 July. The vessels sampled in close proximity to each other during the survey.

The survey stations are divided into multiple districts, which are defined by ADF&G commercial crab management units (Fig. 5). Management units are defined by registration areas and districts, which are further divided into strata with standard or high station densities. Standard-density strata have stations centered in 20 × 20 nmi (37.04 × 37.04 km) cells while high-density strata include additional stations at the corners of the 20 × 20 nmi cells. To calculate the total area for each stock strata the area for each 20 × 20 nmi cell is assumed to be 401 nmi^2 due a spherical projection of the grid surface in an area as large as the EBS.

The king crab Registration Area T in Bristol Bay (south of 58° 39 ′N and east of 168° W) is 54,536 nmi^2 and consists of 136 stations. The king crab Registration Area Q in the Bering Sea is divided into the Northern District (north of 58° 39′ N) and the Pribilof District (south of 58° 39′ N and west of 168° W). The area for the St. Matthew Island Section of the Northern District is divided into two sampling strata: 1) a high-density 7,218 nmi^2 stratum with 28 stations (one of which is not trawlable but included in the total area surveyed) and 2) a standard-density 11,629 nmi^2 stratum with 29 stations creating a total of 56 stations within the St. Matthew Island Section. The area of the Pribilof District is divided into two sampling strata: 1) a high-density 10,025 nmi^2 stratum with 41 total stations and 2) a standard-density 14,436 nmi^2 stratum with 36 stations creating a total of 77 stations within the stock area. For Pribilof District blue king crab, the eastern stock boundary is 20 miles east of the Pribilof District and includes nine additional stations, as indicated in the 2013 Pribilof Islands Blue King Crab Rebuilding Plan. In general, for all crab stocks, high-density strata have more stations (standard, corner) per area than standard-density strata.

The fishing gear used in 2015 was identical to that of previous EBS annual bottom trawl surveys since 1982 with both vessels fishing a standard 83-112 Eastern otter trawl with an 83 ft (25.3 m) headrope and a 112 ft (34.1 m) footrope (Lauth and Nichol 2013). The codend mesh size is 8.9 cm stretched and the liner is 3.2 cm. The trawls on each vessel were rotated every 20-30 consecutive tows (~5 days) to mitigate potential impacts from changes in net configuration due to fishing. Each tow was approximately 0.5 h in duration and 1.5 nmi (2.8 km) in length at a speed of 3 knots (1.54 m sec^{-1}) and conducted in strict compliance with NMFS bottom trawl protocols established by the National Oceanic and Atmospheric Administration (Stauffer 2004).

Net mensuration equipment was used to monitor the net's fishing performance during each tow (Lauth and Nichol 2013). A bottom contact sensor was attached to the center of the footrope to measure bottom contact of the net at 1-second intervals. The net mensuration system also consisted of an acoustic sensor attached to the headrope and two sensors attached to the port and starboard dandylines to measure net height and width during trawling operations. The bottom contact of the footrope and GPS data were used to calculate distance fished. Fishing power was assumed to be equal between the two vessels.

Surface and bottom water temperatures along with temperature-depth profiles were collected at 6-second intervals throughout the duration of each tow using a Sea-Bird SBE-39 bathythermograph continuous data recorder (Sea-Bird Electronics Inc., Bellevue, WA) attached to the headrope of the net. The temperature measurement range of the SBE-39 is -5 to 35 ± 0.002 °C with pressure sensors measuring to a maximum depth of 1,000 ± 1 m and are calibrated every year by Sea-Bird Electronics. Bottom depth was also derived from these data by adding the net height from the net mensuration system to the headrope depth recorded by the SBE-39.

Biological Data Collection

All crab were removed from the catch, sorted by species and sex, and a total catch weight was obtained for each species. Tanner and snow crab hybrids are identified by a combination of characteristics including curve of the epistome margin, eye color, carapace shape, and space between or shape of the rostrum horns (Karinen and Hoopes 1971, Urban et al. 2002). A random subsample of the total catch occurred when an exceptionally large number (> 300) of a species was caught in a tow. The subsample varied in size and composition depending on the particular tow. The subsample may have occurred at the level of the entire catch or at the level of a particular size and sex category once the catch was sorted. The total weights of the sampled crab and non-sampled crab were recorded and an expansion factor was calculated to determine the final number of each species in the catch.

Individual crab carapaces were measured (± 1 mm) to provide a size-frequency distribution of each sample. Crab sizes are reported as carapace width (CW) excluding spines for Tanner and snow crab, and carapace length (CL) for all king crab and hair crab (Donaldson and Byersdorfer 2005). Since 2006, individual weights were measured for blue king crabs every year, red king crab and snow crab in odd years, and for Tanner crab in even years to add to the existing length-weight data and to monitor temporal variability in length-weight regressions. For every haul in 2015, data were collected on up to five intact red king and Tanner crab per each of the following

categories: 1) male crab, 2) ovigerous crab, and 3) non-ovigerous female crab. Because of their relative rarity, weight data were collected for all intact blue king crabs encountered that met the sampling requirements (i.e., whole, live crab without regenerating limbs). Weights were collected from representative size ranges throughout the spatial distribution of each species. Measurements were regionally stratified and tally sheets ensured all size ranges were equally sampled within each region.

In the absence of specific age data, shell condition classification by length and sex is necessary for apportioning stock abundance and biomass for determination of stock status, analytical stock assessment, and for establishing annual management controls. Shell condition class serves as a semi-quantitative index of molt status and time in shell post-molt. For all EBS crab stocks, and particularly those which exhibit a terminal molt at maturity (i.e., *Chionoecetes* spp.), shell condition is a requisite for setting overfishing limits and harvest quotas. Carapace shell condition was assessed for each crab sampled and assigned to one of six classes according to specific criteria (0 = premolt or molting, 1 = soft and pliable, 2 = new hardshell both firm and clean, 3 = oldshell slightly worn, 4 = oldshell worn, 5 = very oldshell).

Clutch assessment is used to estimate spawning stock biomass and overall reproductive health and to monitor demographic changes in the mating population. All female crab abdomens were evaluated to determine reproductive condition based on the color of the eggs (0 = no eggs, 2 = purple, 3 = brown, 4 = orange, 5 = purple-brown, 6 = pink), the condition of the eggs (0 = no eggs, 1 = uneyed, 2 = eyed, 3 = dead, 4 = empty egg cases), and the size of the egg clutch (0 = immature, 1 = mature female no eggs, 2 = trace to 1/8, 3 = 1/4, 4 = 1/2, 5 = 3/4, 6 = full).

For mature females, egg clutch and egg condition codes were used to identify the stage in the molt-mate cycle, where the presence of eyed embryos, empty egg cases, or absence of eggs (barren, hereafter) in morphologically mature females were indications of an incomplete cycle while mature females brooding uneyed embryos indicated completion of the cycle. The ratio of females with eyed embryos, empty egg cases, and old shell barren to uneyed embryos was derived as a measurement of the molt-mate cycle progression during the survey.

Understanding reproductive biology is critical for managing crab stocks in the Bering Sea. Spatiotemporal variability in reproductive potential including fecundity, sperm reserves, and reproductive condition likely regulates fluctuations in population abundances. Yet, most stock assessment models use spawning stock biomass (i.e., number and average weight of mature animals), but not embryo production, which can lead to different perceptions of productivity (Swiney et al. 2012, Trippel 1999). In recent years, egg clutches for red king crabs in Bristol Bay and *Chionoecetes* spp. throughout the eastern Bering Sea were collected during the survey to support process studies to assess female reproductive potential. Red king crab and snow crab fecundity varies interannually and spatially likely due to demographic variability in crab age as measured by size and shell condition (Rugolo et al. 2005, Swiney et al. 2012). Starting in 2012, mature female red king crab samples were collected (even years only) throughout their distribution to monitor fecundity changes over time. Future analyses will consider the correlations of reproductive potential with demographic and environmental patterns.
In addition, mature female *Chionoecetes* spp. with shell condition 1-3 were collected in collaboration with ADF&G (see Table 4).

Maturity in male *Chionoecetes* spp. can be defined by morphometric characteristics of the chela where morphometrically immature and mature crab are separated into two morphometric groups based on the frequency distribution of the chela height (large claw or small claw) to carapace width ratio (Stevens et al. 1993, Tamone et al. 2007). To assess the difference between morphometric maturity and true functional maturity, additional special projects have been conducted in recent years. As standard sampling protocol, chela height and carapace width measurements were taken for male Tanner crabs during even years starting in 2008, while chela height and carapace width measurements for male snow crabs were taken in odd years starting in 2009. In 2015, chela height and carapace width measurements (± 0.1 mm) were collected from a subsample (typically < 15 crab per haul) of male snow crab caught at each station.

Bitter crab syndrome is caused by a parasitic dinoflagellate, *Hematodinium* sp., and is found in Tanner and snow crab throughout Alaskan waters (Meyers et al. 1996). The mortality rate of parasitized crabs is believed to be high and symptoms include lethargy, pink carapace pigmentation, and white opaque hemolymph (Meyers and Burton 2009a). Meats of parasitized crabs are harmless to humans, but are bitter tasting making the crabs unmarketable. The prevalence of bitter crab syndrome fluctuates temporally and spatially between *Chionoecetes* spp. in the eastern Bering Sea (Meyers et al. 1996) and may be affected by changes in environmental conditions (Morado et al. 2010). Black mat syndrome is caused by a parasitic fungus, *Trichomaris invadens*, and was prevalent in the 1970s and 1980s throughout Alaskan waters, primarily infecting Tanner crab, but does not pose human health concerns if infected Tanner crab meat is consumed (Meyers and Burton 2009b). Infected crabs have a dense, hard, black, tar-like covering over parts of the exoskeleton, which invades internal tissue causing destruction of the host (Meyers and Burton 2009b). Infections can prevent molting, cause blindness if eyestalks are infected, or result in mortality depending on the severity of the infection. Infected sub-legal crabs could fail to reach legal size or sexual maturity. All crab carapaces were scanned for evidence of bitter crab syndrome and black mat fungus to understand its temporal and spatial variability. In addition, 200 Tanner and snow crab blood samples were collected in each of three index sites, which was comprised of 10 stations per index site (20 crabs sampled per station). Samples were set aside for further testing by scientists in the Shellfish Assessment Program, Pathobiology group at the AFSC in Seattle, Washington.

Crab Biomass Estimates

Crab density (number nmi^{-2}) was estimated at each station for legal males, or sublegal males, as well as mature and immature males and females of each stock. Maturity and legal size classes were based on literature values and State of Alaska regulations (Table 1). The ADF&G definition of legal size classes (CW in inches) include spines (ADF&G 2012), while CW measurements reported in this document exclude spines (Table 1). The area swept by the trawl (nmi^2) was calculated as the product of the distance traveled while the net had bottom contact by the mean net width over the duration of the tow. Prior to 2009, data reported in this annual document used a fixed width of 15.2 m (0.008 nmi) in the area-swept calculation to maintain consistency with historical calculations of crab abundances (Fig. 4). Since 2009, all population biomass estimates for the entire time series are calculated using the variable net width based on net mensuration data (Table 2). The effective width of the trawl typically ranges from 14.6 to

18.3 m when towing at a speed of 3 knots (Weinberg 2003; Fig. 6), and changes with the depth of the tow due to changes in scope of the trawl wire (Rose and Walters 1990). For 2015 and all historical data reported in this current document, crab densities were calculated using the mean net width recorded for the duration of each tow and a mean net width-inverse scope regression relationship was calculated when net width values were not recorded during a tow (Rose and Walters 1990). From 1975 to 1981, the net width estimates used for the area-swept calculations were derived from a single width estimate calculated each year for a particular type of trawl used during the annual survey. From 1982 to 1987, the net width used in the area-swept calculations was estimated using the inverse relationship between net scope and net width developed by Rose and Walters (1990). From 1988 to 2015, the net width was estimated using the net mensuration system described above, which measures the height and width of the net throughout the duration of the tow (Table 2, Fig. 6). Distance traveled by the trawl was determined from ship GPS positions recorded at the beginning and end of each tow.

All reported historical data and the current biomass estimates are calculated for the number of individual male and female crab species at each 1 mm size category using the weight-size relationships developed by the AFSC's Kodiak Laboratory (Table 3). The size-weight relationships are described by the expression:

$$W = a\, L^{b} \quad ,$$

where W is the total weight in grams, L is either CL or CW in millimeters, *a* is the intercept in log scale and *b* is the slope. Parameters *a* and *b* for the size-weight relationships are estimated from a linear regression fitted to log-transformed size-weight data.

The weights calculated at each 1 mm size category are summed within the legal male, sublegal male, mature and immature size categories for each species and sex caught at a station. The crab biomass within a district or section stratum was estimated by averaging crab densities from all stations within the defined district or section stratum and multiplied by the total area of the district or section stratum specific to that stock. Total biomass was calculated using a stratified design based on management units (standard density, high density, ADF&G-defined districts, or section stratum). Population biomass estimates were calculated in each stratum and then summed among strata. Variance of the total biomass estimate for each size class was calculated by summing the variance of each stratum. The 95% confidence intervals were calculated using the standard error of the total population multiplied by 1.96. All biomass estimates and confidence intervals (± 95%) reported in this document are reported in metric tons (t) except in the Abstract where both t and pounds (lb) are reported. Metric tons can be converted to lb by multiplying the biomass in t by 2,204.62 for comparison with ADF&G reported values of total allowable catch (TAC) and guideline harvest levels (GHL).

In years with colder than average bottom water temperatures (1999, 2000, and 2006-2012), a small number of standard Bristol Bay stations sampled at the beginning of the survey were resampled in late July to accurately assess the percentage of ovigerous red king crab females which had extruded a new clutch of uneyed embryos. In 2015, average bottom temperatures at Bristol Bay stations in June were warm relative to recent years. All ovigerous females had uneyed embryos indicating the completion of the annual reproductive cycle. As such, Bristol Bay

stations were not resampled as in some previous years. Therefore, as with the other species described in this document, the 2015 population estimates for Bristol Bay red king crabs for both males and females were calculated using standard tows (sampled in June).

The population biomass estimates reported in this document are point estimates and have substantial uncertainty due to the expanse of the area being sampled and the distributions of the resource. These point estimates are least precise for small crabs due to gear selectivity, and for females of some stocks due to crab behavior. For example, female blue king crab prefer rocky habitat, which is difficult to sample with bottom trawls. For consistent analyses and due to a lack of available data, catchability is assumed to be near or equal to one for the indices developed in this document. The stock assessment models that incorporate these survey data consider catchability when estimating abundance and biomass.

Centers of Distribution

The centers of distribution for male and female crab from 1975 to 2015 were determined by averaging the latitude and longitude of each positive tow for a particular species. Latitude and longitude were weighted by the CPUE for each size and sex class. In cold years when Bristol Bay stations were resampled (discussed in more detail below), only tows from Leg 1 were included.

Recruitment

Population fluctuations are likely influenced by variations in recruitment strength. Thus, assessing temporal variability in abundances of new individuals reaching the minimum legal size is important to predict the following season's catches. The term "recruitment" can refer to various life history stages including newly settled juveniles, individuals reaching sexual maturity, or individuals reaching the legal size limit. For the purposes of this technical memorandum, "pre-recruits" are defined as mature male crabs in the size class that will likely enter the fishery (minimum legal size limit) the following year, also referred to as "P1" crabs by some stock assessment authors (Table 1). A time series of pre-recruit abundance estimates are provided as an index for future abundances of legal crab.

RESULTS

Survey Overview

The 2015 EBS bottom trawl survey consisted of 376 total bottom trawls (375 used for crab analysis) conducted from 2 June to 29 July over an area of approximately 140,350 nmi^2 beginning in the southeast corner of Bristol Bay, moving east to west and finally moving from the stations northwest of St. Matthew Island to the stations along the slope edge south. The latitude and longitude of the midpoint of each successful tow along with the duration (h), distance fished (km), bottom depth (m) and bottom temperatures (°C) are listed in the Appendix. The mean distance fished across all tows was 1.52 nmi (2.81 km, SD = 0.12 nmi) with a range of 0.76 to 1.68 nmi (1.41 to 3.12 km) and the mean tow duration was 30.5 minutes (SD =

2.37 min). The fishing depth of the 83-112 Eastern otter trawl ranged from 21 to 170 m with a mean gear depth of 80.8 m (SD = 33.7 m). The mean net width per tow ranged from 13.7 to 20.5 m and the average mean net width for all 375 successful tows was 16.8 m (SD = 1.11 m, Fig. 6). The 2015 net fishing performance (distance fished, tow duration, gear depth, net width) was consistent with previous years with the exception of 1975, when tow duration was 60 minutes and mean distance fished was 2.26 ± 0.18 nmi.

The bottom temperature at each station during the standard survey ranged from -1.5 °C to 8.0 °C (Fig. 7). A cold pool of water < 2°C extended onto the middle shelf between the 50 and 100 m isobaths to approximately 60 nmi north of St. Paul Island. Warmer bottom temperatures were evident around the Pribilof Islands and in shallow waters around Nunivak Island and in Bristol Bay. Cold water temperatures persisted in the northwestern area between the 50 and 200 m isobaths and the waters surrounding St. Matthew Island. In 2015, the average bottom water temperature during the first survey leg (2 to 17 June) was 4.6 °C (SD = 0.7) which was comparable to the average mean bottom water temperature during the same time period in 2014, but warmer than that during 2006-2012. For a second year in a row, average bottom and surface temperatures were warmer in both Bristol Bay and the rest of the eastern Bering Sea relative to recent years (Fig. 8).

Population abundance and biomass of the seven commercial crab stocks sampled during this survey fluctuated dramatically from 1975 to 2015 (Figs. 9-14). Overall commercial crab mature male biomass decreased from approximately 300,000 t to below 100,000 t in the mid-1980s, increased to just below 500,000 t due to increases in snow and Tanner crab in the early 1990s, and has since leveled out around 200,000 t in the past 7 years.

Seven special projects were conducted in addition to the standard assessment survey to collect specific biological data from particular crab species (Table 4). Four of the projects originated from the AFSC: 1) collect Tanner and snow crab blood samples at three index sites to monitor bitter crab syndrome, 2) collect female snow crabs to assess annual versus biennial reproductive cycles, 3) deploy pop-up satellite tags on mature male and female red king crabs, and 4) collect ovigerous female snow crabs for laboratory larval and juvenile growth and habitat studies. Three projects originated from ADF&G: 1) collection of Tanner crabs for the evaluation of reproductive potential, 2) collection of snow crabs for the evaluation of reproductive potential, and 3) collection of snow crab specimens for age determination studies.

Four hundred and eighty-three snow crab and 578 Tanner crab blood samples were collected from six index sites and 50 live immature male snow crab were collected outside index sites to monitor bitter crab syndrome. Approximately 600 snow crabs were collected for the annual versus biennial reproduction study. Pop-up satellite tags were deployed on 40 ovigerous and 40 mature male red king crabs. Thirty female and 8 male snow crabs were collected for growth and habitat studies. Four hundred and ninety-four mature female snow crab, 149 mature female Tanner crab, and 40 mature female *Chionoecetes* spp. hybrid crab were collected to assess female reproductive potential. Forty male snow crab were collected for the age determination project. All collections were completed within the guidelines stipulated by the ADF&G collection permit for each project (CF-15-078, CF-13-002, CF-15-059, CF-15-066, CF-15-025, CF-15-063).

Bristol Bay District Red King Crab

Red king crab were caught at 67 of the 136 stations in the Bristol Bay management district in 2015. Bristol Bay red king crab were caught at an average depth of 62.9 m (SD = 11.2 m), which has been similar over the last 30 years. The density of legal-sized male crab caught at a station ranged from 66 to 2,140 crab nmi^{-2} (see Appendix). Legal-sized male Bristol Bay red king crab were caught at 48 stations (Table 5; Appendix), resulting in a total biomass estimate (± 95% CI) of 27,209 ± 9,612 t (Table 6) and a total abundance estimate (± 95% CI) of 8.7 ± 3.0 million crab (Table 7) in the Bristol Bay District. The majority of mature males were concentrated in the central and southwest section of Bristol Bay along the Alaska Peninsula (Figs. 15-17). The 2015 estimated biomass of legal-sized males is lower than last year, but similar to the 20-year average of 27,109 ± 4,872 t (Table 6).

Red king crab mature males were encountered at 53 of the 136 surveyed stations with no one station dominating in abundance (Fig. 17). One hundred percent of the 387 mature males and 217 immature males caught were measured (Table 5). The estimated biomass of 32,121 ± 11,019 t for mature males is 87% of the total male biomass in 2015 (Table 6) with immature male red king crab estimated at 4,984 ± 2,639 t (Table 5). The majority of both size categories were located in the central and northern Bristol Bay District (Figs. 16 and 17).

In 2015, an overall decrease in male red king crabs was observed compared to last year (Fig. 18). Seventy-four percent of legal-sized males were new hardshell crabs and 26% were oldshell and very oldshell crabs with the majority of oldshell males caught in central Bristol Bay (Fig. 19).

One objective of this multi-species bottom trawl survey is to assess the mature red king crab population when mature females are carrying newly extruded, uneyed embryos after completion of the molt-mate cycle (Otto 1986). Embryo development and larval hatching in female red king crab, followed by the molting and mating cycle, are delayed in years with cold bottom water temperatures (Chilton et al. 2010, Shirley et al. 1990, Stevens and Swiney 2007). During years with colder than average bottom temperatures (1999, 2000, and 2006-2012), the ratio of eyed to uneyed embryos encountered in mature females on the survey in June was higher compared to warmer years (2001-2005, 2013-2015). In years with relatively warmer water temperatures, more than 94% of the mature females in June carried uneyed embryos (Chilton et al. 2010). The eyed to uneyed embryo ratio ranged from 6.54 to 0.42 in cold years, compared to 0.06 to 0.00 in the warmer years, indicating that in cold years, a high number of females within the survey area did not complete the molting and mating cycle in early June. The ratio of eyed to uneyed embryos in mature females decreased dramatically when the Bristol Bay stations were resampled in cold years, ranging from 0.06 to < 0.01, and indicating that the majority of mature females completed the mating and molting cycle (Table 8).

The indication that the molting and mating cycle is delayed is determined during the first leg of the survey by high numbers of oldshell mature females either brooding eyed embryos, which were fertilized from the previous season, or with pleopods exhibiting empty egg cases. To determine whether we need to tow the Bristol Bay red king crab stations again, the reproductive

condition of the mature female red king crab and the change in abundance of males and females between survey legs during cold years are assessed.

Unlike 2006-2012, the relatively warm water temperatures in 2015 did not delay the molting and mating cycle in mature female red king crab. All of the 607 mature females sampled during the standard survey had extruded a new clutch of uneyed embryos (Table 8). Average bottom temperature of Bristol Bay stations with mature female red king crab in June was 4.6 °C in 2015, which is similar to that of 2014, but warmer than recent years (2006-2012). Bristol Bay stations were not resampled in 2015.

The 2015 mature female red king crab biomass estimate of 26,296 ± 15,078 t (Table 6) and abundance estimate of 18.4 ± 10.6 million crabs (Table 7) is 88% of the total female abundance with immature female red king crab biomass estimated at 838 ± 1,067 t (Table 6). The majority of the mature female red king crab were caught in the central area of Bristol Bay and along the Alaska Peninsula (Fig. 20).

Historically, most mature red king crab collected during the survey were new hardshell crabs (Fig. 21). Generally, a portion of the population is in the old or very old shell condition for males, while almost all of the mature females have been new hardshell (Fig. 21). In 2015, 99% of female red king crab had new shells and 99% of mature females had clutches of uneyed eggs that were either 75% or 100% full (Fig. 22), which is encouraging because it shows high mating success.

The centers of distribution for mature male and female red king crab shifted north and east of the southwest Bristol Bay region from 1980 to 1987 (Fig. 23). From 1988 to 1991, the mature female distribution slightly shifted south before returning to the northeastern distribution while males remained in the northeast. Loher and Armstrong (2005) hypothesized that the shift during the late 1970s and early 1980s was due to warmer bottom temperatures. In more recent years from 2008 to 2012 when the cold pool extended onto the Bristol Bay shelf area, the distribution of mature females and males moved from the central area of Bristol Bay to the nearshore areas along the Alaska Peninsula supporting this hypothesis (Chilton et al. 2010). This may be because females avoid water cold enough to delay embryogenesis during brooding (Stone et al. 1992). The center of distribution for mature females in 2015 was similar to that of 2014, which is unsurprising given both were warm years.

The location of ovigerous females at larval release may impact post-larval settlement success and recruitment strength in subsequent years. Given the known current structure in Bristol Bay, larvae released from females located in southwestern Bristol Bay would have a higher likelihood of settling in inner Bristol Bay. A northward shift in adult spatial distribution may reduce larval supply along the Alaska Peninsula and in inner Bristol Bay which is likely more favorable for juvenile survival than elsewhere in Bristol Bay (McMurray et al. 1984, Zheng and Kruse 2006). If this mechanism is true, reduced settlement success in warm years relative to cold years (Evans et al. 2012) may explain population trends over the past several decades. Year-class strength was high during the 1970s and early 1980s, but has been generally low since 1985 (Figs. 24 and 25). High abundances in the 1970s occurred when the spawning stock was located in southern Bristol Bay (Armstrong et al. 1993), while the low abundances starting in the mid-1980s may be caused

by the warmer bottom temperatures and adult spatial shift. Despite relatively cold years in 2008-2012 and an extended cold pool, estimated population abundance has been low in recent years. The 2015 mature male and female and pre-recruit population abundance estimates were lower compared to 2014. A strong juvenile size group (40 mm to 50 mm CL size category) was observed in 2011 and could be associated with the colder temperatures in 2008-2012. The strong 2011 juvenile size class was not observed in 2012 or 2013, but relatively high abundances of females appeared in the 110-120 mm size class in 2014, which may be attributed to the strong juvenile size group seen in 2011 (Figs. 24 and 25).

Pribilof District Red King Crab

Historically, red king crab were not abundant in the Pribilof District and landings were taken incidentally during the blue king crab fishery. The red king crab fishery first opened in 1993 while fishing for blue king crab was closed. A combined fishery for red and blue king crab occurred in the Pribilof District from 1995 through 1998, but due to low abundance of blue king crab, the combined fishery and the red king crab fishery have both remained closed since the 1998-1999 season (Gish 2006).

Red king crab were caught at 10 of the 77 stations in the Pribilof District, all of which were in the high-density sampling area in 2015. Pribilof District red king crab were caught at an average depth of 67.2 m (SD = 4.6 m), which has been similar over the last 30 years. The density of legal-sized males caught at a station ranged from 69 to 9,640 crab nmi^{-2} (Appendix). Legal-sized male red king crab were caught at 9 of the 77 stations in the Pribilof District (Table 5) with a biomass estimate (± 95% CI) of 14,788 ± 21,553 t (Table 9) and an abundance estimate (± 95% CI) of 3.3 ± 4.7 million crab (Table 10). Legal-size males represented 97% of the total male biomass and were above the average of 4,989 ± 1,733 t from the previous 10 years (Table 9).

Mature males were encountered at 9 of the 77 stations in the Pribilof District, all of which were in the high-density sampling area (Fig. 27). All of the 195 mature and 7 immature males caught were measured (Table 5). Four stations accounted for 97% of all mature red king crab caught (Fig. 28). The biomass estimate of mature males was 15,173 ± 21,971 t and represented 99% of the total male biomass (Table 9) with the remaining 1% represented by 113 ± 200 t of immature male red king crab (Table 5). Mature males were distributed around St. Paul Island in the nearshore shallow water stations and to the west and south of St. Paul Island (Figs. 27 and 28).

The 2015 size-frequency for red king crab males shows considerably more newshell legal-sized males compared to 2014 and 2013 (Fig. 29). In 2015, 44% of the legal-sized males were new hardshell crabs and distributed around St. Paul Island. Fifty-six percent of the legal-sized males were in oldshell and very oldshell condition and primarily distributed to the west and south of St. Paul Island (Fig. 30).

The 2015 biomass estimate of mature red king crab females was 3,859 ± 7,270 t and abundance was 1.8 ± 3.3 million crab, representing 100% of the total female biomass collected during the survey (Tables 9 and 10). Female biomass estimates are imprecise due to the limited number of tows with positive crab catches (Appendix; Fig. 26), yet 2015 estimates indicate mature female

biomass is higher than the average over the last 10 years (Fig. 13). All of the mature females were new hardshell between 100 and 160 mm CL and 95% of the mature females were carrying 75% or 100% full clutches of uneyed embryos (Fig. 31).

The centers of distribution for both males and females have moved within a 40 nmi by 40 nmi region around St. Paul Island (Fig. 32). The center of the red king crab distribution moved to within 20 nmi of the northeast side of St. Paul Island as the population abundance increased in the 1980s and remained in that region until the 1990s. Since then, the centers of distribution have been located closer to St. Paul Island the exception of 2000-2003, which were located towards the north east.

Specific mechanisms for population fluctuations are unknown for Pribilof red king crab. However, it is generally acknowledged that climate change impacts marine ecosystems, including Bering Sea crab and fish species. A climatic regime shift took place in the North Pacific Ocean during the winter of 1976-77, which was characterized by an abrupt transition from a negative to positive Aleutian Low Pressure Index (ALPI) and Pacific Decadal Oscillation (PDO) resulting in warmer air and sea surface temperatures relative to pre-1977 conditions. After the 1977 regime shift, a slight increase in Pribilof red king crab occurred followed by a larger increase in the 1990s (Figs. 33 and 34). Male Pribilof red king crab size distribution has been relatively stable over the past 4 years, with an increase in mature male and female abundance in 2015. Yet this increase should be interpreted with caution due to the high variability with the population estimates, and the fact that pre-recruit abundance decreased in 2015.

Pribilof District Blue King Crab

Blue king crab were caught at 9 of the 86 stations in the Pribilof District; all in the high-density sampling area in 2015 (Fig. 35). Pribilof District blue king crab were caught at an average depth of 68.5 m (SD = 3.7 m), which has been similar over the last 30 years. The 2015 biomass estimate (± 95% CI) of legal-sized males was 428 ± 385 t (Table 11) and abundance was 0.12 ± 0.11 million crab (Table 12), representing 40% of the total male abundance and well below the average of 1,292 ± 737 t for the previous 20 years (Tables 11 and 12).

Blue king crab mature males were caught at 8 of the 86 stations in the Pribilof District and all of the 13 mature males and four immature males caught were measured (Table 5; Fig. 36). The mature male biomass estimate of 622 ± 480 t represents 88% of the total male biomass with 82 ± 120 t of immature male blue king crab estimated in the Pribilof District (Tables 5 and 11). All male blue king crab were captured around St. Paul Island (Figs. 36, 37, and 39).

Eleven mature female blue king crab were caught in the Pribilof District high-density sampling area which extrapolated to a biomass estimate of 160 ± 207 t (Table 11) and an abundance estimate of 0.20 ± 0.26 million crab, and represents 100% of the total female biomass. Estimates of female biomass are imprecise due to their preference for rocky habitat which is difficult to sample with bottom trawls. Blue king crab females are predominantly biennial spawners with only a portion of the female population carrying eyed embryos in a given year, while the remainder are in a non-embryo-bearing phase (Somerton and Macintosh 1985). Four of the

11 mature female blue king crab sampled in the Pribilof District were brooding uneyed embryos and seven had no eggs (Fig. 40). One mature female with embryos had a 75% full clutch and three had 100% full clutches (Fig. 40).

The centers of distribution for both males and female blue king crab are located within a 40 nmi by 40 nmi region east of St. Paul Island (Fig. 41). The center of the blue king crab distribution moved to within 20 nmi of the northeast side of St. Paul Island as the population abundance decreased in the 1980s before moving easterly in the 1990s. Since then, the centers of distribution have been located at the northeastern edge of the distribution. In 2015, the mature male and female centers of distribution were located approximately 10 nmi north east of St. Paul Island.

Pribilof blue king crab production was higher in the late 1970s and early 1980s, and increased in the 1990s and female abundances were at an all-time high in 1980 (Figs. 42 and 43). A pulse of male and female blue king crabs in the 55-60 mm CL size class was seen in 2005, yet this cohort was not observed at elevated abundances in subsequent years. Overall male and female blue king crab abundances have been extremely low in recent years with no evidence of improving.

St. Matthew Island Section, Northern District Blue King Crab

The blue king crab fishery in the St. Matthew Island Section of the Northern District opened in 2009 after a 10-year rebuilding plan but was closed due to ADF&G harvest regulations in 2013. Blue king crab were caught at 20 of the 56 total stations in the St. Matthew Island Section sampling strata; 17 stations in the high density area, and three stations in the standard density area (Fig. 44). St. Matthew Island blue king crab were caught at an average depth of 55.4 m (SD = 19.0 m), which is the shallowest depth of the time series and approximately 20 m shallower than the long-term average depth (74.8 m; SD = 4.8 m). Seventy-one legal-sized male blue king crab were caught in 2015 with a biomass estimate (± 95% CI) of 3,592 ± 5,468 t (Table 13) and abundance estimate (± 95% CI) of 2.0 ± 3.1 million crab (Table 14) representing 60% of the total male biomass which is above the average of 3,055 ± 826 t from the previous 20 years (Table 13).

Mature male blue king crab were caught at 19 of the 56 stations surveyed in the St. Matthew Island Section sampling strata and 100% of the 119 mature and 42 immature males caught were measured, respectively (Table 5, Figs. 45 and 46). Historically, one station (R-24) has greatly impacted population estimates for St. Matthew Island blue king crab. In 2015, 68% of the mature males were caught in R-24 (Fig. 46). The mature male biomass estimate in 2015 was 5,134 ± 7,656 t, representing 86% of the total male biomass (Table 13), while the immature male biomass was estimated at 825 ± 1,310 t (Table 5). The majority of the immature male blue king crab were distributed in the shallow waters surrounding St. Matthew Island while the majority of mature males were caught at one station (R-24) north of St. Matthew Island (Figs. 45 and 46).

Overall male St. Matthew Island blue king crab abundance was similar in 2015 compared to 2014, including newshell and oldshell crabs (Fig. 47). In 2015, 78% of the legal-sized males

were new hardshell crabs, with the majority distributed north (R-24) of St. Matthew Island (Fig. 48).

The 2015 mature female blue king crab biomass estimate was 24 ± 35 t and abundance was 0.05 ± 0.07 million crab (Table 14), representing 83% of the total female biomass, and the immature female blue king crab biomass estimate was 5 ± 9 t (Table 13). Mature females were caught at two stations and immature females were caught at one station in the St. Matthew Island Section sampling strata (Fig. 45). Of the two mature females, one was a new hardshell crab with no eggs, and the other was an oldshell crab with empty egg cases (Fig. 49).

The centers of distribution for both males and female blue king crab are located within a 30 nmi by 30 nmi region around St. Matthew Island (Fig. 50). The center of the blue king crab distribution has randomly moved within this region without a clear pattern of years proximal to each other. In 2015, the mature male and female centers of distribution were located near the northwest end of St. Matthew Island.

NMFS survey abundance estimates for St. Matthew blue king crab do not exist prior to 1978. As such, production cannot be compared before or after the 1977 regime shift. Size distribution abundance estimates (Figs. 51 and 52) suggest that production of male crabs has been relatively stable in recent years. In 2015, the abundance of pre-recruit male crab in the 105-119 mm size class was similar to that in 2014, and slightly above the previous 20-year average (Fig. 14). Yet the high variability and low mature female estimates suggest trends should be interpreted with caution. It is important to highlight that recent fluctuations in population abundance estimates are primarily caused by catch numbers in one station (R-24).

Tanner Crab

In 2011, the ADF&G Board of Fish changed the legal-size limit of Tanner crab from ≥ 5.5 inches CW (138 mm, without spines) to ≥ 4.4 inches CW (110 mm, without spines) west of 166° W and ≥ 4.8 inches CW (120 mm, without spines) east of 166° W (Table 1). According to the regulatory harvest strategy of the State of Alaska (5 AAC 35.508), the annual TAC or GHL for Tanner crab in both areas is determined by the biomass estimate of males ≥ 125 mm CW. The harvest strategy is based on the assumption that the commercial fishery will target legal size crab (Zheng and Pengilly 2011), although the industry may self-impose retention of crab ≥ 4.9 inches CW (125 mm, without spines) east and west of 166° W. We provided the 2015 biomass estimates for the two legal-size categories as well as for ≥ 4.9 inches CW east and west of 166° W in the abstract.

Tanner crab were caught at 103 of the 120 stations east of 166° W and 156 of the 255 stations west of 166° W with Tanner crab occurring at 41 and 11 stations in the high-density areas of the Pribilof District and St. Matthew Island Section, respectively (Appendix; Fig. 53). Tanner crab were caught at an average depth of 81.5 m (SD = 21.8 m) east of 166° W and 102.2 m (SD = 30.4 m) west of 166° W, which has been similar for the entire time series.

Legal-sized Tanner crab were caught at 89 of the 120 stations east of 166° W and 104 of the 255 stations west of 166° W (Table 5, Fig. 54). Ninety percent of the legal-sized males caught east of 166° W were measured and 89% of the legal-sized males caught west of 166° W were measured (Table 5). The 2015 biomass estimate (± 95% CI) for legal male Tanner crab east of 166° W was 22,853 ± 6,247 t (Table 15) and abundance was 30.7 ± 7.8 million crab with 79% of those males ≥ 4.9 inches CW with a biomass estimate of 19,301 ± 5,771 t (24.1 ± 6.8 million crab; Tables 15 and 16). The 2015 biomass of legal Tanner crab in the eastern area was substantially above the 20-year average biomass of 12,590 ± 3,204 t. The majority of the Tanner males ≥ 113 mm CW east of 166° W were distributed in the southwest section of Bristol Bay (Figs. 54 and 55).

The 2015 biomass estimate for legal male Tanner crab west of 166° W was 27,067 ± 8,461 t (Table 17) and abundance was 46.0 ± 14.1 million crab with 43% of those males ≥ 4.9 inches CW with a biomass estimate of 14,306 ± 5,040 t (19.6 ± 7.0 million crab; Tables 17 and 18). The 2015 biomass of legal Tanner crab in the western area was above the 20-year average biomass of 13,940 ± 4,574 t. The majority of Tanner males ≥ 103 mm CW west of 166° W were distributed around the Pribilof Islands (Figs. 54 and 55).

The scatterplot of the allometric relationship between chela height and carapace width using the combined data collected in 2008, 2010, 2012, and 2014 (n = 5,432) graphically represents two distinct maturity groups: immature, small claw males with a ratio of less than 0.18 and mature, large claw males with a ratio greater than or equal to 0.18 (Fig. 56). The carapace widths for small claw males ranged from 14.0 to 137.3 mm compared to 61.4 to 177.1 mm for large claw males. Large claw males with carapace widths below the legal-size limit will not recruit to the fishery in the future, as morphometrically mature male *Chionoecetes* spp. crab will not molt again during their lifespan (Tamone et al. 2007).

In the areas east and west of 166°W, overall newshell males decreased slightly (Figs. 57 and 58). In both areas, most male crabs above 100 mm CW had similar proportions of new and oldshell, and were distributed in the southwest section of the EBS shelf at depths greater than 100 m (Fig. 59).

The 2015 mature female Tanner crab biomass estimate east and west of 166° W was 4,675 ± 3,126 t and 6,536 ± 4,526 t (27.6 ± 19.2 and 45.4 ± 33.7 million crabs), respectively, while the immature female Tanner crab biomass east and west of 166° W was 628 ± 372 t and 1,038 ± 415 t, respectively (Tables 5, 15-18). Forty-two percent of the mature female population was distributed east of 166° W in the ADF&G Eastern management district in the central and southwestern area of the Bristol Bay District (Fig. 54). In the eastern area only, 2% of the mature females were softshell, while 8% were new-hardshell and 90% were oldshell and very oldshell (Fig. 60). In the western area only, less than 1% of the mature females were softshell, while 35% were new-hardshell and 64% were oldshell and very oldshell (Fig. 61). In the eastern region 97% of the mature females carried newly extruded embryos while 3% were brooding eyed embryos, had not produced a new clutch, or were barren (Fig. 60). In the western region, 95% of the mature females carried newly extruded embryos, while less than 1% were brooding eyed embryos and 5% had empty egg cases or were barren (Fig. 61). In the eastern region, 5% of the mature females were 1/2 full, 77% were 3/4 full, and 13% were full, while in the western region 11% were 1/2 full, 45% were 3/4 full, and 32% were full (Figs. 60 and 61).

Pulses of strong recruitment to the mature male and female population appear to have been cyclical throughout the eastern Bering Sea (Figs. 62 and 63), yet it is unclear what environmental conditions triggered the pulses, or if strong cohorts are sequentially linked as theorized for snow crab (Ernst et al. 2005, Ernst et al. 2012, Parada et al. 2010). Shell condition can be used to infer if mature female Tanner crab are primiparous (first clutch of eggs) or multiparous (subsequent clutches). For example, mature newshell female crabs (shell condition 2) are assumed to be primiparous (first clutch of eggs) and likely molted to maturity during the prior winter (Ernst et al. 2005).

The shell condition time series demonstrates that the survey fails to detect portions of the population. For example, the population estimate of newshell (shell condition 2) female Tanner crab east of 166° W was 37 million in 1990, yet the estimate of oldshell (shell condition 3) mature females was 76 million in 1991 (Fig. 62). Assuming newshell females become oldshell the following year, estimates of oldshell females should be at or below levels of newshell females the year prior. Further, the shell condition time series for mature male Tanner crab should be interpreted with caution, as physiological, morphological, and functional male maturity vary by size. In most of the historical survey data, it is not possible to differentiate morphologically mature and immature males. Thus, a size cutoff is suboptimal for assessment of mature crabs, and future research will strive to refine the accuracy of estimating mature population abundances.

The centers of distribution for both males and female Tanner crab have moved within a 160 nmi by 100 nmi region east of the Pribilof Islands and west of Bristol Bay (Fig. 64). The center of the distribution moved from the eastern extent of the distribution in the 1970s to the western extent in more recent years.

There is little evidence of changes in Tanner crab production related to the 1977 regime shift (NPFMC 2011b), yet pulses of strong production have been cyclical from 1975 to the present (Figs. 65-68). A less pervasive regime shift occurred in 1989, as characterized by briefly negative ALPI and PDO indices, but the system did not return to pre-1977 conditions. A slight increase in Tanner crab production coincided with the 1989 shift, although the links between climate and crab production remain speculative. A decrease in abundance of pre-recruit male crabs both east and west of 166° W relative to 2014 was observed; however, levels are still above the average over the past 20 years (Fig. 14). The male size frequency distribution in 2014 reveals an increase in abundance of male crabs between 100 and 125 mm CW west of 166° W, which may be related to the slight increase of crabs between 120 and 140 mm CW in 2015 (Figs. 65-68).

Snow Crab

Although the legal minimum size limit for male snow crab is 3.1 inches CW (78 mm), processors currently prefer a minimum size of 4.0 inches CW (102 mm). The biomass estimates for male snow crab are reported for both legal and preferred size categories in the abstract.

Snow crab were caught at 255 of the 375 stations in the combined areas of the Bristol Bay District, Pribilof District, and St. Matthew Island Section sampling strata (Fig. 69). Snow crab were caught at an average depth of 88.0 m (SD = 24.2 m), which has been similar for the entire time series.

Legal-sized snow crab were caught at 214 of the 375 standard stations and 89% of the legal-sized males caught were measured (Table 5). Legal-sized male snow crab estimated biomass (± 95% CI) was 71,550 ± 16,480 t (Table 19) and abundance was 183.8 ± 36.2 million crab (Table 20) which was 12% of the total male abundance. This biomass is lower than the 20-year average legal male snow crab biomass of 142,222 ± 32,838 t. Thirty-one percent of those legal males were ≥ 4.0 inches CW with a biomass estimate of 35,838 ± 12,682 t (57.2 ± 18.0 million crab).

In 2015, a total of 1,008 male snow crab chela height and carapace width measurements were collected on the EBS bottom trawl survey. The scatterplot of the allometric relationship between chela height and carapace width using the data collected in 2009 (n = 1,303), 2011 (n = 1,130), 2013 (n = 943), and 2015 (n = 1,008) graphically represents two distinct maturity groups for snow crab; immature males (small claw) with a ratio of < 0.20 and mature males (large claw) with a ratio of ≥ 0.20 (Fig. 72). The carapace widths for small claw males ranged from 19.4 to 121.2 mm compared to 40.6 to 151.6 mm for large claw males.

An increase in the number of juvenile new hardshell males in the 30 to 75 mm size category was observed over the past 3 years (Fig. 73). Among legal-sized male crab, approximately 1% were in molting or softshell condition while approximately 57% were in new-hardshell condition and distributed between the 50 and 100 m isobaths in the middle shelf of the EBS survey area as well as between the 100 and 200 m isobaths in the northwest area of the EBS shelf (Figs. 73 and 74). Forty-two percent of the legal-sized males were oldshell and very oldshell condition crabs and primarily distributed in the southeastern section of the EBS shelf (Fig. 74).

The mature female snow crab biomass estimate of 128,825 ± 45,120 t and abundance estimate of 1,238.6 ± 497.4 million crab was 78% of the total female biomass (Tables 19 and 20). The immature female crab biomass estimate was 35,701 ± 17,247 t (Tables 5 and 19). Among sampled mature females, 30% were in new-hardshell condition and 70% were oldshell and very oldshell condition (Fig. 75). Ninety-five percent of the mature females were brooding new embryos, while 2% had eyed embryos (Fig. 75). Less than 1% of the mature females had empty egg cases and 3% were barren (Fig. 75). Seventy-six percent of mature females with embryos were 75% and 100% full (Fig. 75).

Pulses of strong recruitment to the mature female population have been cyclical (Fig. 76), and it is hypothesized that strong cohorts are sequentially linked (see Ernst et al. 2012, Parada et al. 2010 for a detailed discussion). As with Tanner crab, shell condition can be used to infer if mature female snow crab are primiparous (first clutch of eggs) or multiparous (subsequent clutches). Mature newshell female crabs (shell condition 2) are assumed to be primiparous (first clutch of eggs) and likely molted to maturity during the prior winter (Ernst et al. 2005). Strong cohorts of mature primiparous females occurred approximately every 7 years starting in 1980 (Fig. 76), which matches the theoretical time required between egg extrusion of mature females

and those offspring reaching maturity (Ernst et al. 2012). It is unknown what specific environmental conditions triggered the initial pulse or how long the sequence may last.

As with Tanner crab, the shell condition time series demonstrates that the survey fails to detect portions of the population. For example, population estimates of newshell (shell condition 2) female snow crab were 125 million in 1999, yet estimates of oldshell (shell condition 3) mature females was nearly 1,000 million in 2000 (Fig. 76). Estimates of oldshell females should be at or below levels of newshell females the year prior. As with Tanner crab, the shell condition time series for mature male snow crab should be interpreted with caution, as physiological, morphological, and functional male maturity vary by size, and it is not possible to differentiate morphologically mature and immature males in most survey data. Future research will strive to refine the accuracy of estimating mature population abundances.

With the exception of 1975 to 1979, the centers of distribution for both males and female snow crab have moved within a 120 nmi by 120 nmi region between St. Matthew Island and the Pribilof Islands (Fig. 77). The center of snow crab distribution moved dramatically to the northwest after 1979. Since then, the centers of distribution have moved throughout the distribution with males having a broader distribution while females are located more to the north.

Mature male and female and pre-recruit-male abundance and biomass is substantially down from 2014, and below the previous 10-year average (Figs. 10-14, 78, and 79). However, an increase in juvenile abundance over the past 3 years provides hope for strong recruitment in upcoming years (Figs. 73, 78, and 79). Ovigerous female snow crab held in water less than 1.5 °C are biennial spawners in the Bering Sea (NPFMC 2011b). Environmental conditions such as temperature and the extent of the cold pool will likely regulate recruitment strength through the numbers of biennial spawners and fecundity of females.

Chionoecetes spp. hybrid

Chionoecetes spp. hybrid crab were caught at 128 of the 375 stations in the combined areas of the Bristol Bay, Pribilof, and Northern Districts (Fig. 80, Appendix).

In this document, *Chionoecetes* spp. hybrid crab size classes for legal males and mature females are based on the size categories for snow crab (see Snow Crab section and Table 1). Legal-sized male *Chionoecetes* spp. hybrid crab were caught at 88 stations, throughout all Districts combined, resulting in a biomass estimate (± 95% CI) of 5,817 ± 1,851 t and were primarily distributed around the Pribilof Islands between 50 and 100 m (Fig. 81). Seventy-six percent of those legal males were ≥ 4 inches in carapace width, with a biomass estimate of 4,430 ± 1,579 t. Sublegal male *Chionoecetes* spp. hybrid crab were distributed throughout the northeastern Bering Sea shelf at depths greater than 50 m (Fig. 81).

The 2015 mature female *Chionoecetes* spp. hybrid crab biomass estimate was 1,988 ± 1,175 t and the immature female crab biomass estimate was 104 ± 85 t. The majority of the mature female *Chionoecetes* spp. hybrid crab were primarily distributed south of the Pribilof Islands and

St. Matthew Island and between 100 and 200 m in the northwestern area of the eastern Bering Sea shelf (Fig. 81).

Other Crab Stocks and Species of Interest

Northern District Red King Crab

Red king crab were caught at 25 stations in the Northern District (Fig. 82) outside of the current management units where red king crab are commercially fished (Fig. 5). Legal-sized males were caught at 11 of those stations and the density at a station ranged from 68 to 86 crab nmi^{-2} (Appendix). The 2015 biomass estimate (± 95% CI) of legal-sized males was 1,016 ± 491 t while the biomass estimate of mature and immature males was 1,376 ± 613 and 354 ± 210 t, respectively. The biomass estimate of mature female red king crab was 319 ± 161 t. The majority of both legal males and mature female red king crab were caught in depths < 50 m at stations south and west of Nunivak Island (Fig. 82).

Northern District Blue King Crab

Blue king crab were caught at one station not included in the blue king crab biomass estimates for the Pribilof District or the St. Matthew Island section sampling strata of the Northern District, which consisted of one legal-sized male (Appendix; Fig. 83).

Hair Crab

Hair crab were caught at 57 of the 375 stations throughout all Districts combined on the survey (Fig. 84). Historically, hair crab have been concentrated just north of the Alaska Peninsula and near the Pribilof Islands. In recent years, abundance of hair crab has been increasing, particularly in central Bristol Bay and west of Nunivak Island.

In this report, legal male hair crab are defined as > 3.25 inches CW (≥ 83 mm CL) which was specified in the previous Pribilof District fishery while the female hair crab biomass estimate is presented for all sizes combined. The 2015 density of legal male hair crab caught at a station ranged from 61 to 635 crab nmi^{-2} resulting in a biomass estimate of 1,338 ± 511 t (Table 21) and abundance of 2.1 ± 0.8 million crab (Table 22). Legal male hair crab were primarily concentrated in the central Bristol Bay area, near St. Paul Island and distributed along the 50 m isobath near Nunivak Island (Fig. 84).

The 2015 sublegal male hair crab biomass estimate (± 95% CI) was 616 ± 424 t and the female hair crab biomass estimate was 127 ± 74 t (Table 21). A high number of sublegal males were caught near St. Paul Island and west of Nunivak Island (Fig. 84).

The Pribilof District hair crab fishery has been closed since 2000 due to a shift in the distribution of legal males to the Northern District and, after one year of experimental fishing with minimal vessel participation, the Northern District fishery was closed in 2001 (Fitch et al. 2012). Since 2005, the biomass estimates of both size classes of male hair crab have been on an increasing trend; however, the 2015 biomass estimate for legal-sized male hair crab was lower than the 20-year average of 2,157 ± 637 t (Table 21).

Golden King Crab

One 163 mm CL newshell male golden king crab was caught at station I-26.

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Table 1. -- Definition of carapace size classes for crab species caught in National Marine Fisheries Service's eastern Bering Sea standard survey. Carapace length (CL) is measured for *Paralithodes* spp. and *Erimacrus isenbeckii*, while carapace width (CW excluding spines) is measured for *Chionoecetes* species. ADF&G uses size to define female maturity (presented in Table 1); however, we define female maturity based on abdominal flap morphology and egg presence throughout this document. The legal size classes defined by ADF&G (CW in inches) include spines.

Species	District		Immature	Mature	Pre-recruit	Legal male
Paralithodes camtschaticus	Bristol Bay	male	<120 mm	≥ 120 mm	110-134 mm	≥ 135 mm CL or ≥ 6.5 in. CW
		female	< 90 mm	≥ 90 mm		
	Pribilof	male	<120 mm	≥ 120 mm	120-134 mm	≥ 135 mm CL or ≥ 6.5 in. CW
		female	< 90 mm	≥ 90 mm		
P. platypus	Pribilof	male	<120 mm	≥ 120 mm	120-134 mm	≥ 135 mm CL or ≥ 6.5 in. CW
		female	< 100 mm	≥ 100 mm		
	St. Matthew	male	< 105 mm	≥ 105 mm	105-119 mm	≥ 120 mm CL or ≥ 5.5 in. CW
		female	< 80 mm	≥ 80 mm		
Chionoecetes bairdi	East of 166° W	male	< 113 mm	≥ 113mm	113-124 mm	≥ 120 mm or ≥ 4.8 in. CW[1]
		female	< 85 mm	≥ 85 mm		
	West of 166° W	male	< 103 mm	≥ 103 mm	103-124 mm	≥ 110 mm or ≥ 4.4 in. CW[1]
		female	< 80 mm	≥ 80 mm		
C. opilio		male	< 95 mm	≥ 95 mm	95-101 mm	≥ 78 mm or ≥ 3.1 in. CW[2]
		female	< 50 mm	≥ 50 mm		
Erimacrus isenbeckii		male				≥ 83 mm CL or > 3.25 in. CW[3]
		female				

[1] The legal minimum size limit for *C. bairdi* is ≥ 4.8 inches CW (120 mm excluding spines; 122 mm including spines) east of 166° W and ≥ 4.4 inches CW (110 mm excluding spines; 112 including spines) west of 166° W (ADF&G reg. **5 AAC 35.520(b)(1)**).

[2] The legal minimum size limit for *C. opilio* is 3.1 inches CW (78 mm excluding spines; 79 mm including spines), although processors currently prefer a minimum size of 4.0 inches CW (102 mm).

[3] Legal-sized male crab for *E. isenbeckii* are larger than a minimum size of 3.25 inches CW (≥ 83 mm CL) defined by Alaska Department of Fish and Game permit guidelines.

Table 2. -- History of methods for determining trawl on bottom and estimating net width on National Marine Fisheries Service eastern Bering Sea bottom trawls.

Year	Net width (m)	Trawling methodology
1975		First and only year tow duration = 1 hour
1976-2012		Tow duration = 30 minutes
1975-1995		Brake set and haul back of winch drum wire defined trawl contact with seafloor (net on bottom)
1996-2012		Began using bottom contact sensors to determine trawl contact with seafloor
1975 - 1980	12.2	Mean width of 400-mesh eastern trawl*
1981	18.0	Mean width* of 83-112 Eastern trawl for Vessel 1
1981	13.4 or 14.3	Mean width* of 400-mesh Eastern trawl measurements different on haul 1-112 and 114-156 for Vessel 37*
1982 - 1987	Variable with each tow	Rose and Walters (1990) calculated the 83-112 net width based on an inverse relationship to net scope
1988 - 2001	Variable with each tow	All survey vessels used ScanMar acoustic sensors on the 83-112 trawl net
2001 - 2012	Variable with each tow	All survey vessels used NetMind acoustic sensors on the 83-112 trawl net
2013 - 2015	Variable with each tow	All survey vessels used Marport acoustic sensors on the 83-112 trawl net

*Single value used for net width when calculating area swept.

Table 3. -- Weight-size regression relationships used to calculate biomass of crab species caught in National Marine Fisheries Service eastern Bering Sea bottom trawl surveys.

Stock	Sex	*a*	*b*
Bristol Bay	males	0.000403	3.141334
red king crab	females	n/a	n/a
	non-ovigerous females	0.000408	3.127956
	ovigerous females	0.003593	2.666076
Pribilof Islands	males	0.000403	3.141334
red king crab	females	n/a	n/a
	non-ovigerous females	0.000408	3.127956
	ovigerous females	0.003593	2.666076
Pribilof Islands	males	0.000508	3.106409
blue king crab	females	0.02065	2.27
	non-ovigerous females	n/a	n/a
	ovigerous females	n/a	n/a
St. Matthew	males	0.000502	3.107158
blue king crab	females	0.02065	2.27
	non-ovigerous females	n/a	n/a
	ovigerous females	n/a	n/a
Tanner crab	males	0.00027	3.022134
	females	n/a	n/a
	non-ovigerous females	0.000562	2.816928
	ovigerous females	0.000441	2.898686
snow crab	males	0.000267	3.097253
	females	n/a	n/a
	non-ovigerous females	0.001047	2.708367
	ovigerous females	0.001158	2.827784
hair crab	males	0.00071731	3.02
	females	0.00119453	2.86

Table 4. -- Special projects related to crab species conducted on National Marine Fisheries Service eastern Bering Sea bottom trawl survey in 2015.

Project title	Principle Investigator	Agency
Bitter crab syndrome	Pam Jensen	RACE[1]-SAP[2]
Annual vs. biennial snow crab reproductive cycle	Kathy Swiney	RACE[1]-SAP[2]
Location of red king crab spawning grounds	Chris Long	RACE[1]-SAP[2]
Snow crab growth and habitat associations	Cliff Ryer	RACE[1]-FBE[3]
Reproductive potential of female Tanner crabs	Laura Stichert	ADF&G[4]
Reproductive potential of female snow crabs	Laura Stichert	ADF&G[4]
Snow crab age determination	Joel Webb	ADF&G[4]

[1] Alaska Fisheries Science Center, Resource Assessment and Conservation Engineering Division, Seattle, Washington.

[2] AFSC, Resource Assessment and Conservation Engineering Division, Shellfish Assessment Program, Kodiak, Alaska.

[3] AFSC, Resource Assessment and Conservation Engineering Division, Fisheries Behavioral Ecology Program, Newport, Oregon.

[4] State of Alaska, Department of Fish and Game.

Table 5. -- Summary of 2015 National Marine Fisheries Service eastern Bering Sea bottom trawl survey details for seven commercial crab stocks. Size categories are defined in Table 1.

		Tows in district	Tows with crab	Crab measured	Crab caught	Biomass (t)	CI (± 95%)
Bristol Bay District	Immature male	136	41	217	217	4,984	2,639
Red King Crab	Mature male	136	53	387	387	32,121	11,019
	Legal	136	48	291	291	27,209	9,612
	Immature female	136	9	79	79	838	1,067
	Mature female	136	44	607	607	26,296	15,078
Pribilof District	Immature male	77	2	7	7	113	200
Red King Crab	Mature male	77	9	195	195	15,173	21,971
	Legal	77	9	182	182	14,788	21,553
	Immature female	77	0	0	0	0	0
	Mature female	77	5	101	101	3,859	7,270
Pribilof District	Immature male	86	2	4	4	82	120
Blue King Crab	Mature male	86	8	13	13	622	480
	Legal	86	5	7	7	428	385
	Immature female	86	0	0	0	0	0
	Mature female	86	4	11	11	160	207
St. Matthew Island	Immature male	56	6	42	42	825	1,310
Blue King Crab	Mature male	56	19	119	119	5,134	7,656
	Legal	56	14	71	71	3,592	5,468
	Immature female	56	1	1	1	5	9
	Mature female	56	2	2	2	24	35
Tanner Crab	Immature male	120	98	1,342	1,342	7,853	2,614
east of 166°W	Mature male	120	94	1,287	1,287	27,241	6,936
	Legal	120	89	972	972	22,853	6,247
	Immature female	120	35	508	508	628	372
	Mature female	120	41	1,289	988	4,675	3,126
Tanner Crab	Immature male	255	149	2,566	2,798	8,036	2,261
west of 166°W	Mature male	255	108	2,390	2,624	31,122	9,281
	Legal	255	104	1,897	2,102	27,067	8,461
	Immature female	255	86	1,157	1,428	1,038	415
	Mature female	255	74	1,027	1,819	6,536	4,526
Opilio Tanner Crab	Immature male	375	226	11,593	53,962	85,434	26,159
	Mature male	375	180	3,043	3,128	46,410	14,071
	Legal	375	214	6,216	6,954	71,550	16,480
	Immature female	375	136	4,282	52,008	35,701	17,247
	Mature female	375	151	5,483	50,123	128,825	45,120

Table 6. -- Time series of biomass estimates (t) for Bristol Bay District red king crab (*Paralithodes camtschaticus*) by size category (CL) and sex from the National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1978	54,371	146,682	66,417	98,241	3,795	141,265	54,370
1979	16,886	86,906	43,304	63,107	5,132	59,165	21,521
1980	37,369	129,829	65,411	106,655	7,594	73,712	46,197
1981	27,294	41,520	12,659	27,368	4,215	59,099	30,597
1982	51,268	23,038	8,656	10,184	21,932	48,913	18,738
1983	25,675	9,796	2,494	2,867	7,257	7,237	2,683
1984	79,710	16,849	8,751	7,623	38,806	17,529	14,374
1985	12,823	14,006	4,130	5,356	1,602	5,723	2,805
1986	12,382	28,189	27,164	13,033	1,847	5,062	2,860
1987	16,626	30,197	14,575	18,167	7,074	15,427	9,677
1988	9,513	25,861	9,178	19,117	1,205	18,019	14,900
1989	7,059	35,503	15,936	27,552	1,322	11,615	7,455
1990	6,344	32,481	14,786	24,527	2,871	17,995	14,579
1991	6,395	60,142	69,981	52,119	1,826	15,553	13,342
1992	6,787	18,327	6,835	13,747	1,088	11,163	5,657
1993	6,939	28,740	12,766	19,839	1,170	16,101	7,849
1994	3,601	19,775	6,740	13,371	1,104	8,283	3,558
1995	6,359	20,939	14,711	15,570	2,992	7,868	3,839
1996	9,067	18,111	7,309	15,073	5,380	12,042	6,829
1997	27,126	32,533	13,321	27,403	3,051	21,365	14,033
1998	13,035	33,297	10,450	19,409	2,161	35,849	17,889
1999	5,093	39,870	16,942	30,005	1,163	19,126	13,276
2000	6,961	31,450	10,638	22,090	2,615	26,387	18,086
2001	8,942	19,060	5,746	15,360	1,692	22,866	13,703
2002	12,113	33,359	12,655	25,241	5,150	19,144	10,306
2003	11,514	63,271	57,913	51,115	5,642	35,587	16,085
2004	27,917	63,159	54,053	53,895	6,162	34,826	18,589
2005	17,036	38,105	14,021	28,373	8,455	42,715	17,805
2006	11,756	39,808	17,766	32,148	6,521	37,005	14,306
2007	14,043	44,115	17,880	34,226	2,257	42,931	19,123
2008	15,840	51,375	35,542	38,155	1,675	44,194	28,234
2009	8,926	34,250	25,727	21,996	760	46,616	30,241
2010	5,441	33,586	16,497	24,891	535	40,951	21,869
2011	7,952	21,990	9,231	16,622	3,515	38,035	19,244
2012	5,841	24,837	13,411	19,858	2,881	27,282	17,713
2013	5,515	34,141	14,164	28,358	547	22,031	15,783
2014	12,621	48,038	17,559	36,130	1,560	50,926	22,953
2015	4,984	32,121	11,019	27,209	838	26,296	15,078

Table 7. -- Time series of abundance estimates (in millions) for Bristol Bay District red king crab (*Paralithodes camtschaticus*) by size category (CL) and sex from the National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1978	89.5	67.9	30.7	38.5	27.8	161.3	61.9
1979	33.4	38.0	19.1	23.6	22.1	57.9	20.3
1980	70.8	51.3	25.3	37.5	34.4	87.9	66.4
1981	41.1	18.4	5.4	9.7	13.1	58.4	29.6
1982	110.9	12.0	4.9	4.0	72.4	52.9	21.8
1983	46.2	5.7	1.5	1.3	23.8	8.7	3.6
1984	164.9	9.1	4.7	3.3	109.8	27.4	23.9
1985	16.8	7.6	2.2	2.3	4.3	8.4	4.1
1986	15.2	14.8	14.6	5.6	5.2	6.4	3.6
1987	24.4	14.6	7.0	7.3	17.4	18.5	11.4
1988	11.3	11.6	4.0	7.5	2.5	20.1	17.0
1989	10.0	15.1	6.5	10.4	3.9	13.2	8.6
1990	9.7	13.7	6.1	8.9	7.8	17.0	13.8
1991	9.7	23.2	26.1	18.5	4.8	14.9	13.8
1992	8.3	7.5	3.0	4.6	2.3	10.2	4.9
1993	8.2	12.5	5.6	7.0	2.8	14.0	7.0
1994	7.1	8.6	2.9	4.8	3.8	6.1	2.5
1995	11.0	9.1	6.9	5.9	6.1	6.3	3.0
1996	17.5	7.2	2.8	5.3	14.3	9.8	5.6
1997	32.6	12.3	4.8	9.2	5.1	21.8	17.1
1998	16.8	15.4	5.0	6.8	6.3	31.7	17.5
1999	11.3	17.4	7.7	11.7	4.1	15.4	10.8
2000	10.7	14.0	4.9	8.4	6.3	21.0	13.6
2001	12.0	7.4	2.2	5.1	4.3	20.9	12.9
2002	22.9	13.6	5.2	8.6	17.6	17.0	9.7
2003	18.8	24.4	19.4	17.1	13.2	28.3	13.2
2004	43.3	23.7	19.8	18.0	19.7	31.7	18.9
2005	31.5	15.6	5.4	9.6	23.6	35.6	15.3
2006	21.2	16.4	7.2	11.8	16.9	31.0	12.2
2007	17.5	18.2	7.1	12.3	4.5	35.8	16.3
2008	17.1	20.9	13.8	12.9	3.7	36.8	24.3
2009	9.6	15.6	11.5	8.3	1.7	35.8	22.4
2010	6.5	14.7	7.0	9.4	1.2	31.5	17.4
2011	37.5	9.3	3.9	6.1	33.0	29.3	15.1
2012	8.0	9.7	4.9	6.7	7.6	19.6	13.2
2013	6.7	12.9	5.3	9.4	1.3	15.6	11.1
2014	15.5	19.7	7.3	12.4	2.8	36.9	17.0
2015	6.7	11.6	4.0	8.7	2.4	18.4	10.6

Table 8. -- Average bottom water temperatures collected at stations with mature female Bristol Bay red king crab (*Paralithodes camtschaticus*) on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey and the ratio of eyed to uneyed embryos in mature red king crab females with the warm years highlighted in gray. Bristol Bay stations were sampled twice during the cold years. An * indicates statistical significance within the year using a two sample t-test, alpha = 0.95 and $P < 0.001$.

Sample event	Average bottom temperature (°C)	Standard deviation (n = stations)	Two sample t-test values	Eyed to uneyed embryo ratio
May 1999	0.1	0.8 (41)	t = -11.9	6.54
July 1999	2.5*	0.8 (31)		0.02
May 2000	1.7	0.5 (49)	t = -9.2	1.45
July 2000	4.6*	1.6 (23)		0.01
June 2001	3.5	0.3 (40)		0.01
June 2002	3.4	0.6 (52)		0.06
June 2003	4.2	0.4 (51)		0.01
June 2004	3.9	0.5 (61)		0.03
June 2005	4.3	0.5 (49)		0.01
June 2006	2.2	0.7 (69)	t = -12.5	0.59
July 2006	4.2*	0.8 (30)		0.01
June 2007	1.8	0.9 (68)	t = -7.4	0.86
July 2007	3.4*	1.0 (32)		0.01
June 2008	1.4	0.7 (76)	t = -9.5	0.45
July 2008	3.6*	1.1 (32)		0.00
June 2009	1.5	1.6 (73)	t = -8.6	0.42
July 2009	4.5*	1.5 (32)		0.00
June 2010	2	0.9 (40)	t = -10.9	0.64
July 2010	4.8*	1.0 (23)		0.03
June 2011	2.9	0.8 (46)	t = -8.6	0.80
July 2011	5.9*	1.1 (20)		0.06
June 2012	0.9	1.2 (40)	t = -8.4	0.91
July 2012	4.0*	1.3 (15)		0.00
June 2013	2.9	1.1 (35)		0.02
June 2014	4.4	0.8 (40)		0.00
June 2015	4.6	0.4 (44)		0.00

Table 9. -- Time series of biomass estimates (t) for Pribilof District red king crab (*Paralithodes camtschaticus*) by size category (CL) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1978	0	1,250	2,022	1,250	0	52	102
1979	0	556	561	488	0	93	182
1980	18	1,269	950	1,269	0	262	374
1981	0	312	358	312	0	35	68
1982	18	1,464	2,002	1,464	14	919	1,402
1983	26	527	551	493	0	309	292
1984	0	317	341	283	0	112	125
1985	0	61	121	61	0	0	0
1986	0	138	188	138	0	79	154
1987	0	54	105	54	31	0	0
1988	713	107	209	44	283	553	940
1989	675	1,529	2,728	871	924	1,327	2,140
1990	7,477	1,141	2,077	138	522	2,200	3,048
1991	640	4,430	6,913	1,321	66	4,967	5,864
1992	274	3,305	3,864	2,528	278	3,153	5,620
1993	282	9,873	17,834	9,189	7	6,471	9,096
1994	430	9,139	13,748	8,117	47	3,917	6,772
1995	431	18,056	21,267	16,793	315	4,834	6,393
1996	68	2,361	1,720	2,330	31	1,976	2,867
1997	1,510	6,159	7,515	5,940	218	1,744	2,018
1998	416	2,324	1,639	1,778	50	1,669	2,487
1999	3,358	5,523	7,217	4,472	4,117	1,302	1,826
2000	157	4,320	3,164	3,843	8	987	1,214
2001	2,339	8,603	13,262	5,770	406	5,369	10,462
2002	8	7,037	9,461	7,014	12	775	803
2003	0	5,373	6,928	5,275	1	2,268	4,032
2004	152	3,622	4,183	3,622	105	1,187	1,238
2005	55	1,238	1,420	1,238	0	3,118	4,791
2006	109	7,003	5,252	6,696	10	2,173	2,627
2007	214	5,224	5,042	5,007	50	1,760	2,647
2008	332	5,462	5,418	5,102	192	2,825	3,701
2009	44	2,500	3,125	2,127	15	811	841
2010	53	4,405	3,767	3,973	0	840	1,167
2011	44	3,834	4,872	3,751	3	814	1,165
2012	336	4,477	5,031	4,360	0	663	710
2013	104	7,749	9,409	7,567	0	169	194
2014	82	12,047	18,525	11,433	0	1,093	2,015
2015	113	15,173	21,971	14,788	0	3,859	7,270

Table 10. -- Time series of abundance estimates (in millions) for Pribilof District red king crab (*Paralithodes camtschaticus*) by size category (CL) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1978	0.0	0.4	0.6	0.4	0.0	0.1	0.1
1979	0.0	0.2	0.2	0.2	0.0	0.1	0.1
1980	0.1	0.4	0.3	0.4	0.0	0.1	0.2
1981	0.0	0.1	0.1	0.1	0.0	0.0	0.0
1982	0.0	0.3	0.4	0.3	0.0	0.5	0.7
1983	0.0	0.1	0.1	0.1	0.0	0.2	0.1
1984	0.0	0.1	0.1	0.1	0.0	0.1	0.1
1985	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	0.0	0.0	0.1	0.0	0.0	0.0	0.1
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	1.9	0.1	0.1	0.0	1.6	0.4	0.7
1989	1.1	0.8	1.4	0.4	1.8	1.1	1.7
1990	7.1	0.8	1.4	0.1	0.7	2.3	3.0
1991	0.7	2.4	3.8	0.6	0.3	4.3	5.1
1992	0.4	1.5	1.8	1.0	0.4	2.4	4.4
1993	0.3	3.5	6.4	3.1	0.0	4.5	6.4
1994	0.4	3.1	4.7	2.4	0.1	2.4	4.2
1995	0.5	5.2	5.9	4.4	0.3	3.0	3.9
1996	0.1	0.6	0.4	0.5	0.0	1.1	1.6
1997	1.6	1.6	1.7	1.4	0.3	1.0	1.1
1998	0.4	0.8	0.6	0.4	0.1	1.0	1.4
1999	7.2	1.9	2.2	1.3	9.5	0.9	1.1
2000	0.1	1.5	1.2	1.3	0.0	0.7	0.8
2001	2.5	3.7	6.1	1.9	0.6	3.8	7.5
2002	0.0	1.9	2.5	1.9	0.0	0.4	0.4
2003	0.0	1.5	2.0	1.4	0.0	1.2	2.1
2004	1.4	0.8	0.9	0.8	1.1	0.5	0.6
2005	0.1	0.2	0.3	0.2	0.0	1.3	2.0
2006	0.1	1.4	1.1	1.2	0.0	1.0	1.1
2007	0.2	1.2	1.3	1.1	0.1	0.8	1.3
2008	0.4	1.3	1.2	1.1	0.2	1.5	2.1
2009	0.0	0.9	1.2	0.7	0.0	0.3	0.3
2010	0.1	1.4	1.3	1.2	0.0	0.6	0.8
2011	0.0	1.0	1.3	1.0	0.0	0.5	0.6
2012	0.4	1.2	1.5	1.2	0.0	0.4	0.5
2013	0.1	1.7	2.0	1.6	0.0	0.1	0.1
2014	0.1	3.0	4.2	2.6	0.0	0.5	0.9
2015	0.1	3.5	4.9	3.3	0.0	1.8	3.3

Table 11. -- Time series of biomass estimates (t) for blue king crab (*Paralithodes platypus*) by size category (CL) and sex in the Pribilof District from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1978	2,765	17,370	18,998	13,517	76	6,416	9,115
1979	61	10,959	6,775	9,040	92	1,097	1,706
1980	2,084	23,553	19,846	20,679	699	211,604	408,004
1981	1,704	11,628	3,963	10,554	497	5,987	5,507
1982	1,152	7,389	2,712	6,893	553	8,824	11,724
1983	962	5,409	1,882	4,474	258	9,990	15,495
1984	130	2,216	993	1,824	15	3,070	2,292
1985	39	1,055	551	755	5	520	457
1986	4	1,505	893	1,473	11	2,420	4,272
1987	191	2,923	2,357	2,781	119	795	909
1988	170	842	873	842	190	528	508
1989	1,275	827	1,034	827	801	945	1,075
1990	2,004	3,078	3,617	1,514	1,118	1,810	1,803
1991	1,377	4,690	3,544	3,326	343	2,433	1,973
1992	1,801	4,391	3,637	3,035	802	1,848	1,737
1993	1,088	4,556	2,743	3,203	444	1,647	1,489
1994	619	3,410	2,305	2,806	87	4,806	4,207
1995	968	8,360	9,898	6,787	331	3,948	4,017
1996	745	4,641	2,444	3,873	177	5,408	5,318
1997	381	3,233	1,749	2,765	194	2,835	2,386
1998	692	2,798	1,367	2,510	267	1,914	1,654
1999	161	1,729	1,141	1,426	0	2,868	2,625
2000	113	2,091	1,212	1,746	0	1,462	1,319
2001	87	1,599	2,302	1,461	0	1,816	2,571
2002	0	680	674	647	0	1,401	2,129
2003	19	702	550	671	21	1,286	1,880
2004	36	107	122	48	25	98	114
2005	326	344	479	344	477	370	413
2006	87	166	196	139	38	538	801
2007	197	306	479	206	59	223	384
2008	212	46	90	46	222	450	560
2009	254	497	695	187	80	545	907
2010	92	303	274	190	84	310	401
2011	0	461	763	399	3	34	49
2012	165	644	928	459	9	229	296
2013	15	250	391	190	12	154	211
2014	83	233	320	233	16	91	108
2015	82	622	480	428	0	160	207

Table 12. -- Time series of abundance estimates (in millions) by size category (CL) and sex for blue king crab (*Paralithodes platypus*) in the Pribilof District from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1978	2.4	6.1	6.0	3.9	0.1	5.9	7.7
1979	0.1	4.1	2.6	3.0	0.1	1.2	1.9
1980	2.7	7.8	6.3	6.2	0.8	182.9	350.4
1981	2.1	3.8	1.3	3.2	0.8	5.4	4.7
1982	1.4	2.4	0.8	2.1	0.9	7.8	10.0
1983	1.0	1.9	0.7	1.3	0.5	9.3	14.2
1984	0.5	0.8	0.3	0.6	0.5	2.8	2.1
1985	0.1	0.4	0.2	0.3	0.3	0.5	0.4
1986	0.0	0.5	0.3	0.5	0.0	2.1	3.7
1987	0.6	0.9	0.7	0.8	0.4	0.7	0.8
1988	1.2	0.2	0.2	0.2	0.9	0.5	0.4
1989	3.5	0.2	0.3	0.2	2.6	1.1	1.5
1990	2.4	1.5	1.8	0.6	2.2	2.0	2.2
1991	1.9	2.0	1.4	1.2	0.8	2.8	2.3
1992	2.4	1.9	1.6	1.2	1.8	2.1	2.1
1993	1.5	1.9	1.1	1.1	0.9	1.8	1.6
1994	0.6	1.3	0.9	0.9	0.1	5.0	4.4
1995	1.1	3.1	3.6	2.2	0.7	4.0	4.1
1996	0.7	1.7	0.9	1.3	0.3	5.0	4.8
1997	0.5	1.2	0.7	0.9	0.3	2.6	2.2
1998	0.9	1.0	0.5	0.8	0.5	1.8	1.6
1999	0.2	0.6	0.4	0.5	0.0	2.8	2.6
2000	0.2	0.7	0.4	0.5	0.0	1.4	1.2
2001	0.1	0.5	0.7	0.4	0.0	1.7	2.5
2002	0.0	0.2	0.2	0.2	0.0	1.2	1.9
2003	0.0	0.2	0.2	0.2	0.1	1.1	1.7
2004	0.1	0.0	0.1	0.0	0.1	0.1	0.1
2005	2.0	0.1	0.1	0.1	2.3	0.3	0.3
2006	0.1	0.1	0.1	0.0	0.1	0.4	0.6
2007	0.2	0.1	0.2	0.1	0.1	0.2	0.3
2008	0.2	0.0	0.0	0.0	0.3	0.4	0.6
2009	0.3	0.2	0.4	0.1	0.2	0.5	0.8
2010	0.1	0.1	0.1	0.1	0.2	0.2	0.3
2011	0.0	0.2	0.3	0.1	0.0	0.0	0.0
2012	0.2	0.3	0.4	0.2	0.0	0.3	0.5
2013	0.1	0.1	0.2	0.1	0.0	0.2	0.2
2014	0.1	0.1	0.1	0.1	0.0	0.1	0.1
2015	0.1	0.2	0.2	0.1	0.0	0.2	0.3

Table 13. -- Time series of biomass estimates (t) for blue king crab (*Paralithodes platypus*) by size category (CL) and sex in the St. Matthew Island Section sampling stratum of the Northern District from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE.

Year	Immature male < 105 mm	Mature male ≥ 105 mm	Mature male ± CI	Legal male ≥ 120 mm	Immature female	Mature female	Mature female ± CI
1978	2,769	5,155	3,990	2,834	369	60	87
1979	2,956	5,707	5,136	3,054	0	1,268	2,037
1980	2,646	7,826	7,151	4,786	423	737	1,248
1981	527	6,175	4,894	4,715	97	63	71
1982	1,758	14,934	9,259	12,065	416	0	0
1983	1,162	8,834	4,907	6,919	78	1,597	2,183
1984	539	3,737	1,358	3,145	42	216	285
1985	404	2,831	1,208	2,405	95	38	60
1986	252	1,267	971	725	99	13	25
1987	495	2,022	1,130	1,284	205	35	49
1988	702	2,830	1,346	1,880	612	123	147
1989	3,041	4,790	2,344	3,415	1,219	504	448
1990	1,122	5,931	3,073	4,707	336	13	25
1991	1,664	6,073	2,918	4,099	521	270	506
1992	1,250	6,279	2,513	4,608	280	216	250
1993	2,106	8,425	2,685	6,258	643	1,635	3,026
1994	916	5,812	2,008	4,246	99	128	131
1995	1,038	4,889	1,653	3,448	182	21	28
1996	1,291	8,494	4,013	6,218	364	432	770
1997	1,342	10,005	6,471	7,341	287	407	707
1998	902	7,478	5,269	5,487	210	243	261
1999	272	1,423	507	1,163	93	14	28
2000	315	1,880	1,136	1,534	52	37	52
2001	483	2,512	1,254	1,937	145	43	48
2002	119	1,640	1,033	1,371	1	89	120
2003	542	1,233	765	918	94	339	430
2004	443	1,341	754	1,139	194	66	82
2005	449	1,396	987	1,016	93	52	76
2006	1,050	3,223	2,262	2,460	145	14	28
2007	2,618	4,564	3,113	2,217	247	47	47
2008	1,972	3,655	2,059	2,701	214	40	45
2009	1,891	5,079	2,630	2,571	218	192	191
2010	3,974	8,141	5,955	4,317	112	456	856
2011	1,699	9,516	10,167	5,701	122	32	46
2012	907	5,652	3,668	3,313	52	74	64
2013	446	2,022	860	1,485	85	27	38
2014	796	5,472	4,750	3,568	40	62	75
2015	825	5,134	7,656	3,592	5	24	35

Table 14. -- Time series of abundance estimates (in millions) for blue king crab (*Paralithodes platypus*) by size category (CL) and sex in the St. Matthew Island Section sampling stratum of the Northern District from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE.

Year	Immature male < 105 mm	Mature male ≥ 105 mm	Mature male ± CI	Legal male ≥ 120 mm	Immature female	Mature female	Mature female ± CI
1978	4.9	3.5	2.9	1.5	1.0	0.1	0.1
1979	4.6	4.1	3.7	1.8	0.0	2.4	3.7
1980	4.2	5.1	5.1	2.5	1.1	1.3	2.2
1981	0.9	3.5	2.5	2.3	0.2	0.1	0.1
1982	3.0	8.3	5.5	5.9	0.9	0.0	0.0
1983	2.0	5.0	2.9	3.3	0.4	2.6	3.5
1984	1.3	1.9	0.7	1.5	0.2	0.3	0.4
1985	0.7	1.5	0.7	1.1	0.3	0.1	0.1
1986	0.6	0.8	0.7	0.4	0.3	0.0	0.0
1987	1.0	1.3	0.8	0.7	0.6	0.1	0.1
1988	1.5	1.8	0.9	1.0	1.6	0.2	0.2
1989	6.2	2.9	1.5	1.8	3.2	1.0	0.8
1990	1.9	3.4	1.8	2.3	0.8	0.0	0.0
1991	3.3	3.9	1.9	2.2	1.4	0.4	0.8
1992	2.2	3.7	1.5	2.3	0.8	0.5	0.5
1993	4.2	5.1	1.7	3.3	1.7	2.3	4.3
1994	1.4	3.6	1.3	2.3	0.2	0.2	0.2
1995	1.7	2.9	1.0	1.7	0.6	0.0	0.1
1996	2.4	5.0	2.5	3.1	1.1	0.7	1.2
1997	2.3	6.0	4.2	3.8	0.8	0.6	1.1
1998	2.1	4.5	3.4	2.8	0.6	0.4	0.4
1999	0.5	0.8	0.3	0.6	0.3	0.0	0.0
2000	0.5	1.0	0.6	0.7	0.1	0.1	0.1
2001	0.8	1.4	0.7	0.9	0.4	0.1	0.1
2002	0.2	0.9	0.5	0.6	0.0	0.1	0.2
2003	1.2	0.7	0.5	0.5	0.3	0.6	0.7
2004	0.9	0.7	0.5	0.6	0.5	0.1	0.1
2005	0.9	0.8	0.6	0.5	0.3	0.1	0.1
2006	1.8	1.9	1.4	1.2	0.3	0.0	0.0
2007	4.5	3.2	2.3	1.2	0.8	0.1	0.1
2008	3.8	2.3	1.3	1.5	0.7	0.1	0.1
2009	3.4	3.6	2.0	1.4	0.6	0.4	0.4
2010	6.2	5.7	4.6	2.5	0.4	1.0	1.9
2011	2.6	6.5	7.2	3.2	0.4	0.1	0.1
2012	1.6	3.8	2.6	1.8	0.2	0.1	0.1
2013	0.8	1.3	0.5	0.8	0.3	0.1	0.1
2014	1.3	3.4	3.4	1.8	0.1	0.1	0.1
2015	1.2	3.2	4.8	2.0	0.0	0.1	0.1

Table 15. -- Time series of biomass estimates (t) for Tanner crab (*Chionoecetes bairdi*) by size category (CW) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys, east of 166° W. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 113 mm	Mature male ≥ 113 mm	Mature male ± CI	Legal male ≥ 120 mm	Immature female	Mature female	Mature female ± CI
1978	11,118	61,795	18,217	56,388	715	17,691	10,685
1979	2,278	15,700	5,632	14,652	591	2,858	2,042
1980	8,433	40,546	25,266	37,082	1,321	11,562	8,541
1981	4,668	18,722	8,004	16,324	893	7,684	4,249
1982	5,518	11,084	3,934	9,415	1,310	6,797	3,505
1983	3,289	10,047	4,708	8,572	913	4,438	2,368
1984	2,522	9,498	4,010	8,376	671	4,129	3,590
1985	1,735	6,495	3,007	5,971	324	2,836	2,350
1986	4,583	5,043	3,078	4,005	1,499	2,006	1,000
1987	17,778	11,085	4,604	9,840	11,912	3,097	1,426
1988	26,460	31,670	29,201	22,482	3,703	19,182	11,150
1989	27,575	60,142	20,624	49,413	6,666	12,309	4,797
1990	23,938	52,942	18,111	47,567	5,990	19,032	8,996
1991	25,932	63,893	40,349	54,968	3,633	27,708	17,830
1992	15,381	74,538	47,450	66,517	346	11,013	4,847
1993	8,056	45,337	17,552	40,826	153	5,171	2,167
1994	3,217	29,086	9,786	26,534	65	5,268	3,096
1995	1,985	17,687	8,332	16,321	250	5,732	3,442
1996	3,435	16,545	10,642	15,562	1,015	5,533	3,885
1997	3,301	5,787	2,014	5,026	967	1,947	857
1998	3,175	5,229	1,580	4,259	550	1,202	492
1999	8,470	6,365	3,007	4,498	1,089	2,272	1,486
2000	5,297	11,131	6,847	8,913	729	2,885	2,197
2001	5,780	10,451	4,498	9,036	2,617	1,314	618
2002	4,359	10,043	4,434	9,030	1,768	1,701	1,106
2003	6,281	10,883	4,939	9,175	705	2,090	940
2004	3,444	9,011	5,060	7,773	267	863	341
2005	5,325	12,118	5,182	10,289	1,673	2,820	2,022
2006	15,136	13,500	5,467	10,921	2,451	4,025	2,318
2007	12,137	15,802	8,749	11,884	696	5,916	4,373
2008	10,424	26,753	28,996	22,447	622	4,457	2,665
2009	3,849	10,937	5,728	8,947	533	4,021	3,045
2010	3,674	10,752	5,420	9,137	795	2,115	1,752
2011	11,865	11,525	6,302	9,814	4,390	2,225	1,174
2012	30,882	14,485	6,790	10,602	5,694	8,550	5,264
2013	25,423	39,157	25,944	23,823	2,344	11,054	7,122
2014	18,262	39,934	12,430	30,404	489	8,159	7,538
2015	7,853	27,241	6,936	22,853	628	4,675	3,126

Table 16. -- Time series of abundance estimates (in millions) for Tanner crab (*Chionoecetes bairdi*) by size category (CW) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys, east of 166° W. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 113 mm	Mature male ≥ 113 mm	Mature male ± CI	Legal male ≥ 120 mm	Immature female	Mature female	Mature female ± CI
1978	46.4	78.8	22.5	67.2	9.8	83.0	53.6
1979	12.7	20.1	7.0	17.8	7.7	13.0	9.5
1980	40.5	50.4	30.6	43.0	15.6	50.5	37.7
1981	29.2	26.2	11.3	21.0	16.1	35.1	20.4
1982	28.2	16.3	6.0	12.7	14.7	31.2	16.6
1983	38.6	15.2	7.1	12.1	30.2	18.3	10.0
1984	27.4	13.0	5.3	10.6	19.5	16.3	13.1
1985	12.0	8.5	3.7	7.4	5.4	10.8	8.0
1986	50.6	7.3	3.8	5.1	37.5	8.7	3.9
1987	136.0	15.7	5.9	13.0	123.1	13.4	5.5
1988	138.2	49.3	41.4	29.6	56.3	84.4	47.9
1989	243.7	89.5	30.2	66.4	183.1	57.8	22.9
1990	167.4	68.1	22.0	56.7	98.7	101.5	47.2
1991	123.4	90.2	61.3	71.3	41.8	145.9	103.7
1992	54.7	105.7	67.0	88.5	5.1	53.9	23.2
1993	30.0	63.8	25.1	54.2	2.9	24.9	10.8
1994	12.8	39.4	13.4	34.0	2.7	27.0	17.2
1995	10.6	24.0	11.0	21.2	5.6	30.2	18.5
1996	29.3	21.8	13.8	19.8	18.1	28.9	20.4
1997	36.5	7.9	2.6	6.3	34.7	11.1	5.2
1998	24.9	7.8	2.4	5.8	13.4	6.7	2.9
1999	50.1	10.1	4.8	6.1	21.3	12.6	7.8
2000	32.7	16.8	10.0	12.1	16.6	15.0	11.2
2001	118.0	14.5	5.6	11.5	112.2	7.1	3.3
2002	45.8	13.2	5.3	11.0	36.4	10.8	7.9
2003	41.8	14.9	5.8	11.2	13.6	12.0	5.7
2004	18.2	12.4	5.3	9.7	8.6	4.5	2.1
2005	41.9	17.5	6.4	13.5	39.3	16.1	12.1
2006	84.0	20.1	7.7	14.6	29.1	21.9	12.0
2007	52.2	24.7	13.0	16.2	11.5	30.5	21.1
2008	42.1	37.8	36.2	28.7	8.9	24.6	15.2
2009	32.8	16.1	8.1	11.8	23.9	22.1	16.9
2010	39.1	15.3	7.3	11.9	29.7	10.6	8.4
2011	135.2	16.0	7.5	12.4	88.8	12.2	6.2
2012	167.6	22.7	10.7	14.4	65.8	52.4	35.7
2013	110.0	69.6	49.7	37.0	33.2	60.8	42.5
2014	75.5	62.3	19.0	41.9	15.1	44.7	42.0
2015	40.2	40.0	9.4	30.7	14.5	27.6	19.2

Table 17. -- Time series of biomass estimates (t) for Tanner crab (*Chionoecetes bairdi*) by size category (CW) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys, west of 166° W. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 103 mm	Mature male ≥ 103 mm	Mature male ± CI	Legal male ≥ 110 mm	Immature female	Mature female	Mature female ± CI
1978	11,891	13,503	6,460	12,409	6,102	8,065	4,136
1979	16,462	15,596	6,183	12,913	3,236	16,465	11,111
1980	64,467	39,038	17,099	27,984	12,199	52,221	33,389
1981	29,763	26,777	8,029	18,061	631	34,893	20,587
1982	14,735	34,520	12,749	25,512	410	57,347	32,263
1983	7,761	16,947	6,540	13,195	1,426	15,993	6,928
1984	5,865	12,625	4,735	10,016	1,573	10,785	5,490
1985	2,533	4,143	1,442	3,169	675	2,718	1,636
1986	6,228	5,758	4,123	3,286	1,210	1,360	831
1987	8,047	8,601	3,960	6,994	3,095	2,042	837
1988	19,282	21,812	12,530	17,868	6,484	6,184	3,169
1989	15,988	29,119	12,768	24,883	5,165	7,090	3,186
1990	16,029	39,509	22,820	35,175	3,869	18,663	17,538
1991	17,926	38,059	13,836	34,230	3,390	17,056	7,234
1992	11,419	26,255	11,787	23,410	1,644	15,213	6,889
1993	7,226	12,651	4,912	10,873	913	6,470	2,484
1994	5,070	10,962	3,745	9,526	1,137	4,579	2,492
1995	3,553	11,757	6,911	10,592	808	6,667	4,052
1996	2,927	7,863	6,170	6,682	424	4,047	3,539
1997	1,986	3,575	1,185	2,873	442	1,451	884
1998	3,041	3,563	1,227	2,602	1,413	1,076	505
1999	4,409	2,311	961	1,679	1,793	1,554	635
2000	4,116	2,787	850	2,003	1,753	1,246	622
2001	8,171	4,918	2,069	3,943	3,741	3,247	1,915
2002	8,691	4,318	1,595	3,029	3,733	2,766	1,375
2003	12,528	8,133	3,789	6,424	3,984	6,313	3,007
2004	13,064	13,404	7,012	9,732	3,866	3,865	1,569
2005	18,964	27,348	10,511	23,655	8,710	8,759	3,745
2006	33,861	39,045	19,584	32,859	10,808	10,914	4,484
2007	35,745	40,540	25,656	31,673	4,944	7,521	2,312
2008	15,705	32,031	17,342	26,351	2,238	7,206	3,191
2009	9,673	22,980	9,143	19,770	2,039	4,456	1,569
2010	8,305	26,296	14,128	23,372	3,008	3,358	1,567
2011	13,198	26,123	17,353	23,259	6,001	3,189	983
2012	19,737	15,027	4,271	11,928	5,982	3,805	1,338
2013	18,417	20,423	9,311	15,939	4,071	6,795	2,393
2014	17,345	33,394	8,146	24,859	2,023	6,705	3,547
2015	8,036	31,122	9,281	27,067	1,038	6,536	4,526

Table 18. -- Time series of abundance estimates (in millions) for Tanner crab (*Chionoecetes bairdi*) by size category (CW) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys, west of 166° W. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 103 mm	Mature male ≥ 103 mm	Mature male ± CI	Legal male ≥ 110 mm	Immature female	Mature female	Mature female ± CI
1978	147.7	19.2	8.7	16.2	143.4	53.8	29.5
1979	135.8	28.2	10.9	20.7	49.0	118.3	80.6
1980	476.3	80.0	33.1	49.0	159.2	380.4	259.6
1981	156.1	56.8	16.8	32.3	10.3	268.7	170.6
1982	74.3	71.3	26.1	46.0	15.5	433.1	265.7
1983	108.0	34.6	13.5	24.1	96.5	109.9	48.3
1984	67.2	25.8	9.6	18.5	59.0	70.1	36.8
1985	28.6	8.4	2.9	5.7	21.0	18.6	12.3
1986	49.3	13.5	10.5	6.5	24.1	8.3	4.6
1987	91.0	16.2	6.6	11.6	74.9	12.9	5.3
1988	198.0	39.9	21.1	28.8	129.9	38.1	18.6
1989	156.4	50.2	19.6	38.3	101.9	43.3	19.2
1990	130.0	65.5	35.9	53.4	75.1	107.5	91.6
1991	162.7	65.2	22.5	54.4	84.1	109.2	48.3
1992	101.9	43.2	15.5	35.1	48.6	97.0	43.1
1993	58.1	23.4	8.4	18.4	26.4	42.6	16.4
1994	46.8	20.0	6.4	15.9	34.3	29.2	15.6
1995	32.4	21.3	12.3	18.1	20.6	43.1	25.9
1996	24.3	15.0	11.1	11.7	15.0	26.2	22.3
1997	24.6	7.3	2.3	5.3	22.6	9.0	5.4
1998	49.1	7.4	2.5	4.7	44.7	6.6	3.1
1999	83.4	5.0	2.2	3.2	79.7	10.1	4.0
2000	71.5	6.0	1.8	3.8	57.0	7.3	3.6
2001	145.2	9.8	3.7	7.0	127.2	21.0	11.5
2002	128.8	9.1	3.2	5.5	111.6	19.1	10.9
2003	171.5	16.4	7.2	11.6	123.8	48.5	26.2
2004	207.5	29.2	15.9	18.9	169.9	27.7	13.5
2005	241.1	49.5	17.8	39.2	215.7	60.7	27.9
2006	287.0	72.3	30.4	54.8	178.1	76.4	31.2
2007	279.4	80.2	45.3	55.1	114.3	51.5	16.3
2008	110.8	62.2	29.9	46.2	53.4	48.6	21.8
2009	98.3	42.7	16.6	33.7	71.4	29.2	10.0
2010	114.2	45.7	21.5	37.5	91.6	21.9	10.1
2011	186.6	42.9	22.9	34.8	157.6	20.3	6.0
2012	223.8	28.7	8.1	20.0	122.0	25.6	8.9
2013	183.9	39.7	17.1	27.0	97.2	48.0	17.0
2014	140.4	68.0	17.8	43.8	90.4	43.6	23.7
2015	67.7	57.4	16.5	46.0	36.3	45.4	33.7

Table 19. -- Time series of biomass estimates (t) for eastern Bering Sea snow crab (*Chionoecetes opilio*) by size category (CW) and sex from National Marine Fisheries Service bottom trawl surveys, all Districts combined. The 95% confidence intervals (CI) are 1.96 SE.

Year	Immature male < 95 mm	Mature male ≥ 95 mm	Mature male ± CI	Legal male ≥ 78 mm	Immature female	Mature female	Mature female ± CI
1980	236,814	99,240	30,937	180,837	27,575	430,527	274,004
1981	166,540	38,042	8,061	97,286	10,988	184,515	64,253
1982	250,475	65,864	19,430	177,794	3,654	227,282	70,174
1983	184,837	68,047	18,468	163,096	3,622	130,458	51,562
1984	119,438	119,971	32,543	183,321	14,119	61,128	23,221
1985	44,214	55,691	12,225	79,334	5,364	9,389	3,987
1986	83,408	58,725	14,454	84,159	26,043	23,904	9,608
1987	266,342	107,536	23,901	178,662	107,989	191,963	70,968
1988	331,332	144,135	53,992	246,515	36,803	266,737	92,391
1989	372,788	143,216	29,275	291,753	23,265	403,064	251,587
1990	306,733	347,750	102,169	521,713	38,213	274,993	110,323
1991	293,255	347,976	105,727	477,618	68,925	308,961	143,935
1992	179,621	166,483	35,962	223,585	49,374	190,954	75,442
1993	273,570	98,857	22,246	143,013	74,921	201,208	65,579
1994	289,633	57,386	12,134	109,683	68,240	196,731	54,382
1995	368,026	61,758	20,003	158,155	31,019	262,904	70,266
1996	341,043	143,856	52,118	312,771	9,274	164,634	48,598
1997	209,131	232,388	57,042	362,928	5,452	158,566	60,958
1998	100,536	164,119	32,216	219,422	13,324	107,253	56,788
1999	44,127	67,352	13,850	87,096	6,160	44,675	20,214
2000	77,782	53,942	16,022	76,830	12,480	148,130	158,837
2001	167,671	56,449	11,370	106,070	17,033	118,922	68,662
2002	83,002	55,907	26,886	100,734	4,388	46,912	29,464
2003	81,606	44,423	10,558	72,396	14,838	61,540	48,531
2004	89,330	44,162	14,554	61,726	30,472	73,191	37,534
2005	184,025	50,072	10,120	105,971	55,125	97,963	42,008
2006	124,579	90,152	61,487	141,960	28,090	81,530	32,441
2007	140,003	99,875	36,249	162,108	27,875	85,820	51,842
2008	114,297	79,600	16,993	123,530	8,994	76,065	31,158
2009	98,468	103,188	30,883	149,588	29,660	79,672	35,105
2010	146,025	105,278	27,471	134,170	90,479	151,576	54,356
2011	149,214	111,662	25,824	145,916	41,232	267,963	100,033
2012	123,683	67,476	18,910	104,438	41,425	223,554	99,132
2013	100,506	58,389	14,779	99,733	31,364	195,938	76,754
2014	140,092	105,441	41,571	151,453	54,523	176,331	72,170
2015	85,434	46,410	14,071	71,550	35,701	128,825	45,120

Table 20. -- Time series of abundance estimates (in millions) for eastern Bering Sea snow crab (*Chionoecetes opilio*) by size category (CW) and sex from National Marine Fisheries Service bottom trawl surveys, all Districts combined. The 95% confidence intervals (CI) are 1.96 SE.

Year	Immature male < 95 mm	Mature male ≥ 95 mm	Mature male ± CI	Legal male ≥ 78 mm	Immature female	Mature female	Mature female ± CI
1980	2,567.0	194.8	65.0	513.4	898.5	4,830.3	3,219.6
1981	1,575.4	79.8	17.7	318.8	233.3	2,047.8	713.9
1982	1,779.0	145.3	44.0	591.1	79.9	2,317.2	770.8
1983	1,486.0	150.3	41.2	511.7	240.5	1,466.0	611.0
1984	1,223.6	237.6	62.8	476.1	551.9	670.0	273.8
1985	444.6	105.9	23.3	195.9	213.0	103.4	44.7
1986	1,143.1	110.6	27.0	211.2	842.1	267.4	110.5
1987	3,758.6	215.7	48.8	493.3	2,955.5	2,040.2	768.0
1988	3,677.9	276.9	94.8	683.8	1,045.8	2,795.6	975.4
1989	3,111.0	292.3	60.6	882.5	564.7	4,625.9	3,417.8
1990	2,263.9	710.4	214.0	1,348.1	1,043.9	3,008.7	1,392.7
1991	3,331.8	618.3	179.4	1,093.8	2,270.7	3,545.4	1,930.8
1992	2,776.2	293.2	62.7	512.9	1,862.2	2,068.9	849.0
1993	4,805.5	182.8	41.9	355.8	2,909.2	2,396.3	818.2
1994	4,116.9	106.4	22.2	320.6	2,684.2	2,204.8	552.4
1995	3,635.3	128.0	43.9	515.7	1,021.7	3,109.1	825.9
1996	2,309.8	302.4	105.2	958.6	258.4	2,107.2	680.4
1997	1,204.4	447.1	100.4	945.8	142.9	2,001.0	813.2
1998	778.2	308.4	59.3	514.6	336.0	1,386.7	791.2
1999	422.4	124.9	23.9	198.8	187.6	551.0	270.0
2000	971.1	102.4	31.8	191.1	391.9	1,649.1	1,711.0
2001	1,529.4	111.3	24.1	312.7	470.9	1,243.8	727.5
2002	596.3	114.7	54.8	284.5	121.1	502.8	342.5
2003	1,073.7	88.1	21.3	196.0	542.4	680.2	601.4
2004	1,491.2	79.9	24.2	147.8	1,375.9	931.9	525.2
2005	1,890.3	89.2	17.6	312.5	1,512.2	1,110.9	498.3
2006	1,178.4	171.9	119.4	377.6	765.7	744.3	304.8
2007	1,260.8	196.7	67.0	435.0	620.4	839.6	623.2
2008	1,008.8	154.3	31.6	325.2	395.9	747.7	445.2
2009	1,055.4	195.7	57.9	371.5	1,059.9	747.2	356.6
2010	2,460.5	184.4	45.1	293.7	3,027.6	1,777.8	654.1
2011	1,829.8	194.1	45.7	330.8	1,175.4	3,137.0	1,190.0
2012	1,384.9	123.5	34.3	274.1	1,165.5	2,656.1	1,309.6
2013	1,055.9	112.6	27.6	280.0	1,029.4	2,222.2	994.7
2014	1,527.8	204.2	76.8	385.3	1,590.8	1,815.6	894.7
2015	1,504.2	84.2	22.3	183.8	1,461.0	1,238.6	497.4

Table 21. -- Time series of biomass estimates (t) for hair crab (*Erimacrus isenbeckii*) by size category (CL) and sex from National Marine Fisheries Service bottom trawl surveys, all Districts combined. The 95% confidence intervals (CI) are 1.96 SE.

Year	Sublegal males < 83 mm	Legal males ≥ 83 mm	Legal males ± CI	Total female	Total female ± CI
1980	988	16,164	11,703	758	1,041
1981	183	10,091	3,658	182	114
1982	182	6,717	3,942	120	70
1983	67	4,231	1,331	296	152
1984	310	3,048	999	106	94
1985	83	2,084	1,041	73	57
1986	207	1,482	787	100	69
1987	355	1,083	607	208	110
1988	631	618	354	168	89
1989	2,955	404	240	43	40
1990	2,540	783	453	255	155
1991	1,393	795	434	230	130
1992	778	591	300	80	53
1993	1,111	2,296	1,588	217	148
1994	1,324	2,413	1,253	194	133
1995	1,396	4,326	2,791	158	84
1996	1,152	3,163	1,738	277	132
1997	584	3,103	1,289	92	56
1998	213	1,984	798	361	241
1999	196	1,735	510	308	125
2000	180	2,873	1,259	331	180
2001	132	1,287	521	565	243
2002	65	1,375	529	101	64
2003	357	659	275	83	49
2004	204	491	191	83	71
2005	328	212	132	273	134
2006	357	661	415	877	954
2007	575	1,278	519	357	168
2008	623	1,346	631	387	174
2009	1,104	1,916	731	464	250
2010	903	1,610	677	469	186
2011	1,752	2,129	935	377	162
2012	3,626	2,878	1,128	534	234
2013	3,357	6,469	2,626	1,055	433
2014	1,144	3,391	1,298	304	139
2015	616	1,338	511	127	74

Table 22. -- Time series of abundance estimates (in millions) for hair crab (*Erimacrus isenbeckii*) by size category (CL) and sex from National Marine Fisheries Service bottom trawl surveys, all Districts combined. The 95% confidence intervals (CI) are 1.96 SE.

Year	Sublegal males < 83 mm	Legal males ≥ 83 mm	Legal males ± CI	Total female	Total female ± CI
1980	3.0	20.8	15.2	4.8	7.8
1981	0.5	12.2	4.5	0.5	0.3
1982	0.6	8.4	4.9	0.4	0.2
1983	0.3	5.3	1.7	0.9	0.5
1984	1.1	3.8	1.3	0.4	0.3
1985	0.3	2.5	1.3	0.3	0.2
1986	0.7	1.9	1.0	0.4	0.3
1987	1.6	1.4	0.7	0.9	0.4
1988	3.9	0.8	0.4	0.9	0.7
1989	12.6	0.5	0.3	0.1	0.1
1990	10.1	1.2	0.8	1.0	0.6
1991	4.8	1.3	0.7	1.2	0.7
1992	2.5	1.1	0.6	0.5	0.4
1993	3.8	3.9	2.6	1.3	1.0
1994	5.0	4.0	2.1	1.3	1.1
1995	5.0	6.6	4.3	0.7	0.3
1996	3.6	5.1	2.7	1.0	0.5
1997	1.7	4.6	1.8	0.4	0.2
1998	0.6	2.9	1.1	1.3	0.8
1999	0.6	2.4	0.7	1.2	0.4
2000	0.5	4.1	1.7	1.2	0.7
2001	0.5	1.8	0.7	2.2	1.0
2002	0.3	2.0	0.8	0.5	0.3
2003	1.3	0.9	0.4	0.5	0.3
2004	0.6	0.8	0.3	0.3	0.2
2005	1.0	0.3	0.2	0.8	0.5
2006	1.2	1.0	0.7	3.6	4.6
2007	2.3	1.9	0.7	1.3	0.9
2008	2.3	2.2	1.0	1.4	0.6
2009	3.6	3.1	1.1	1.7	0.9
2010	3.3	2.5	1.0	2.2	1.1
2011	6.9	3.5	1.4	1.6	0.6
2012	11.8	4.6	1.8	2.2	0.8
2013	10.3	10.7	4.6	4.0	1.7
2014	3.3	5.4	2.0	1.0	0.4
2015	1.8	2.1	0.8	0.6	0.3

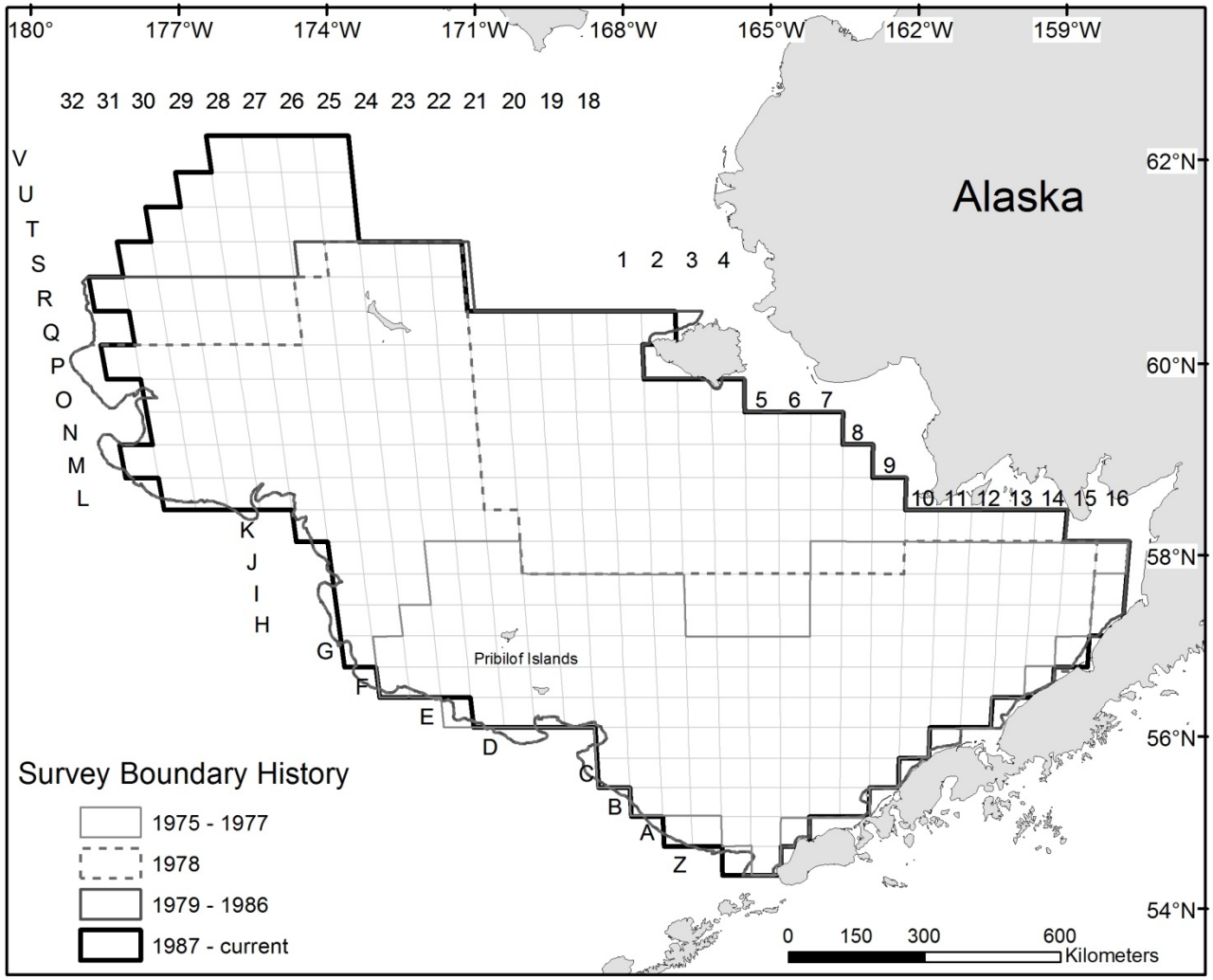

Figure 1. -- National Marine Fisheries Service eastern Bering Sea bottom trawl survey boundary from 1975 to present indicating four major stanzas in total coverage.

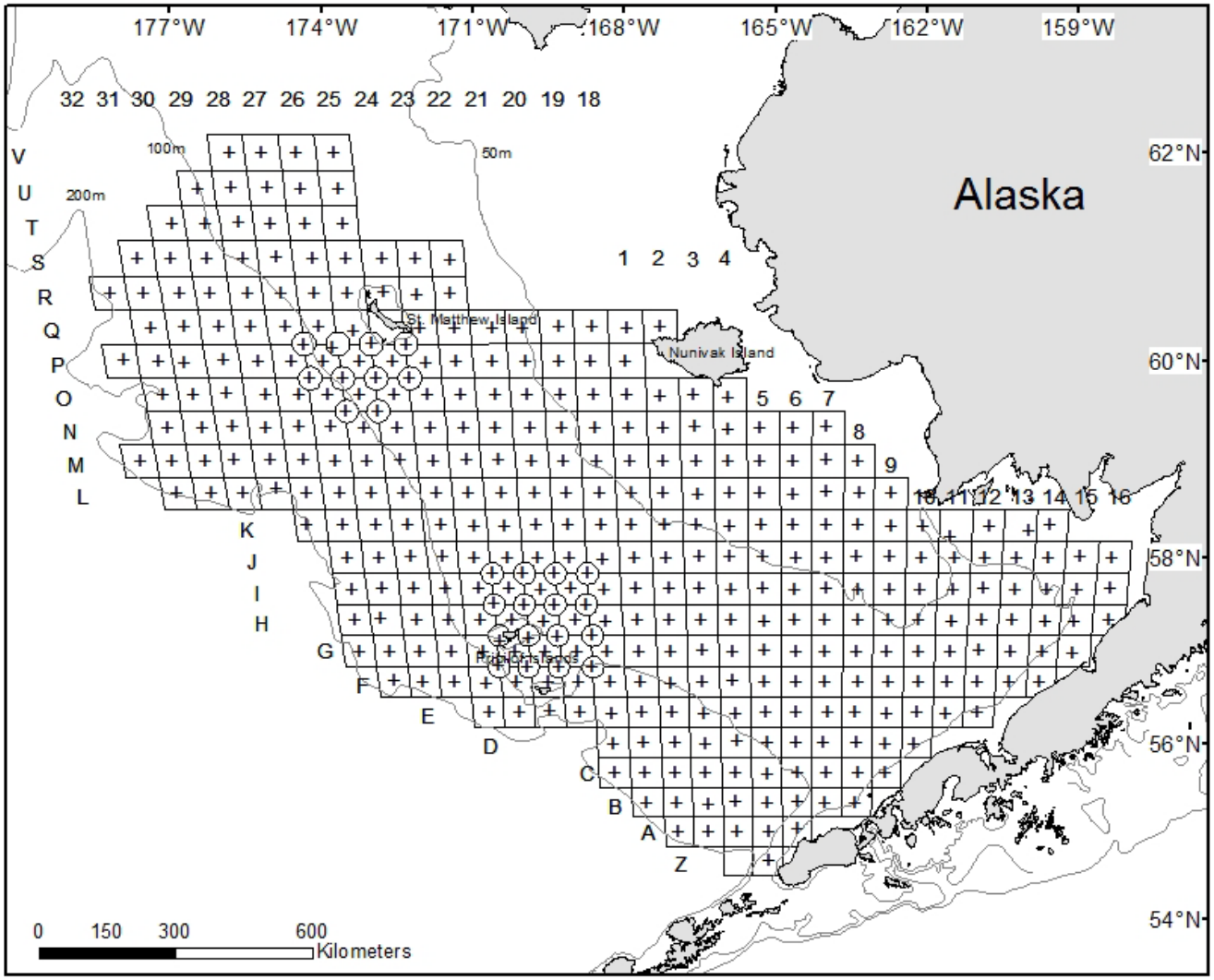

Figure 2. -- National Marine Fisheries Service eastern Bering Sea standard bottom trawl area surveyed by the FV *Alaska Knight* and the FV *Vesteraalen* from 2 June to 29 July 2015.

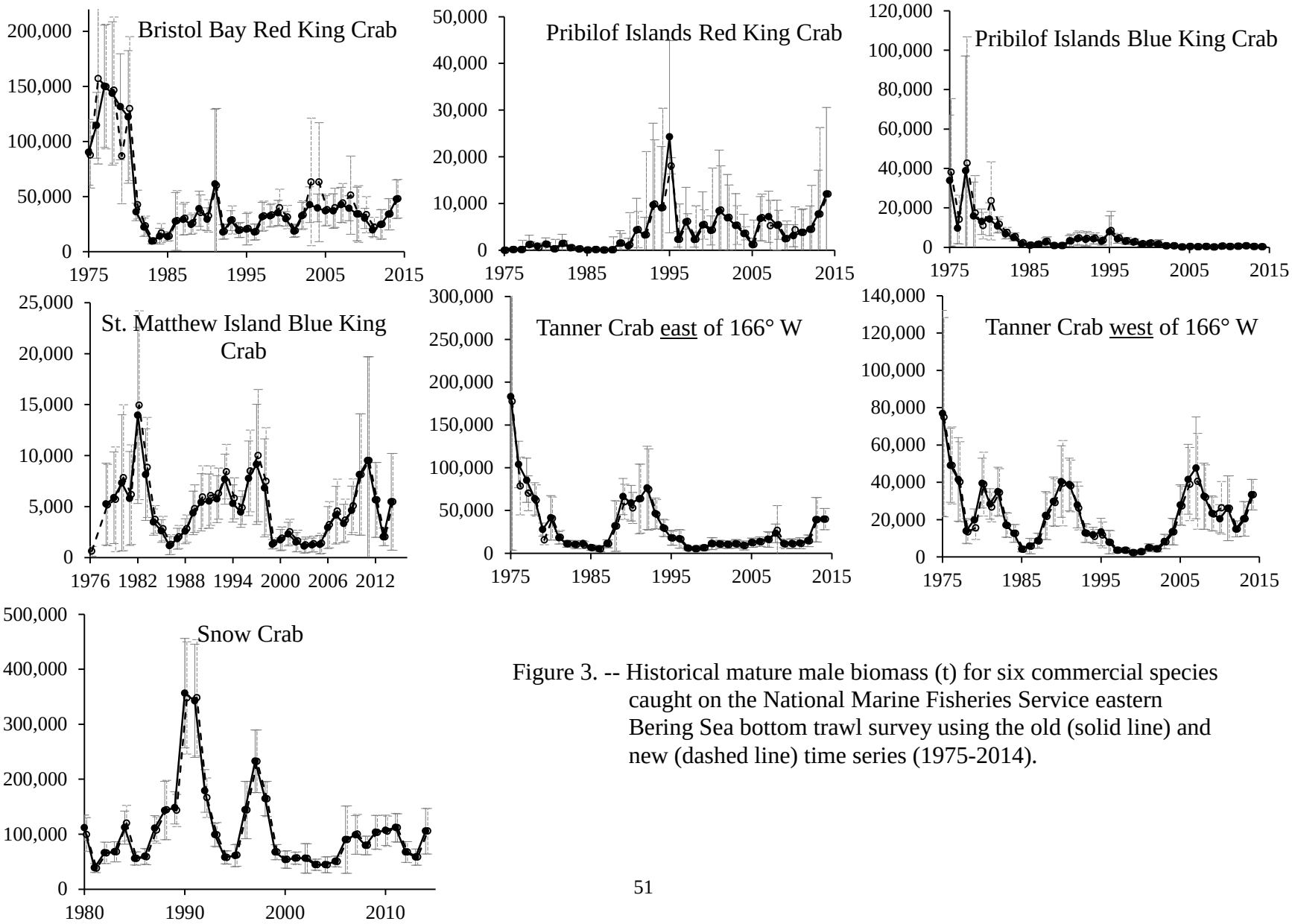

Figure 3. -- Historical mature male biomass (t) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey using the old (solid line) and new (dashed line) time series (1975-2014).

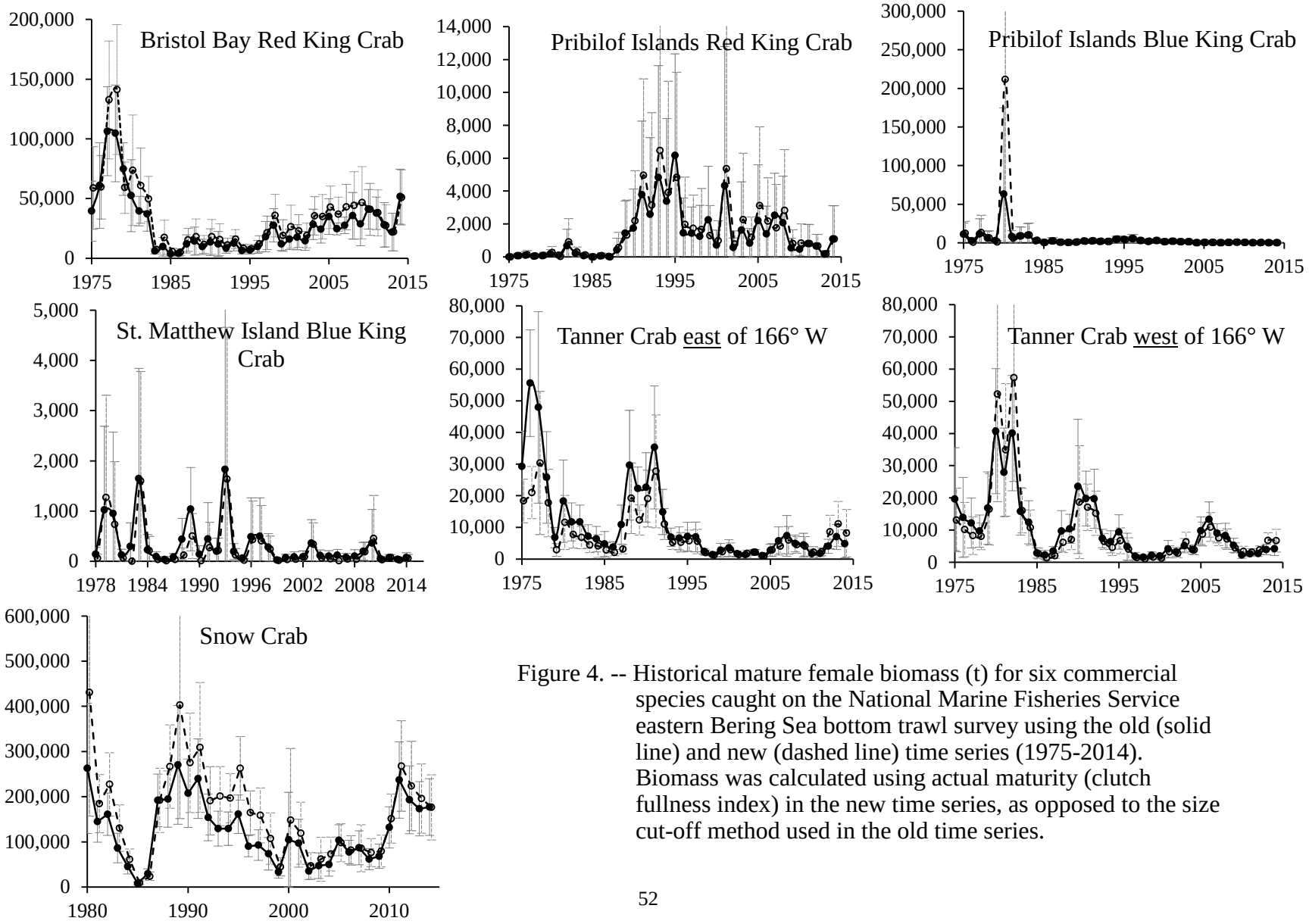

Figure 4. -- Historical mature female biomass (t) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey using the old (solid line) and new (dashed line) time series (1975-2014). Biomass was calculated using actual maturity (clutch fullness index) in the new time series, as opposed to the size cut-off method used in the old time series.

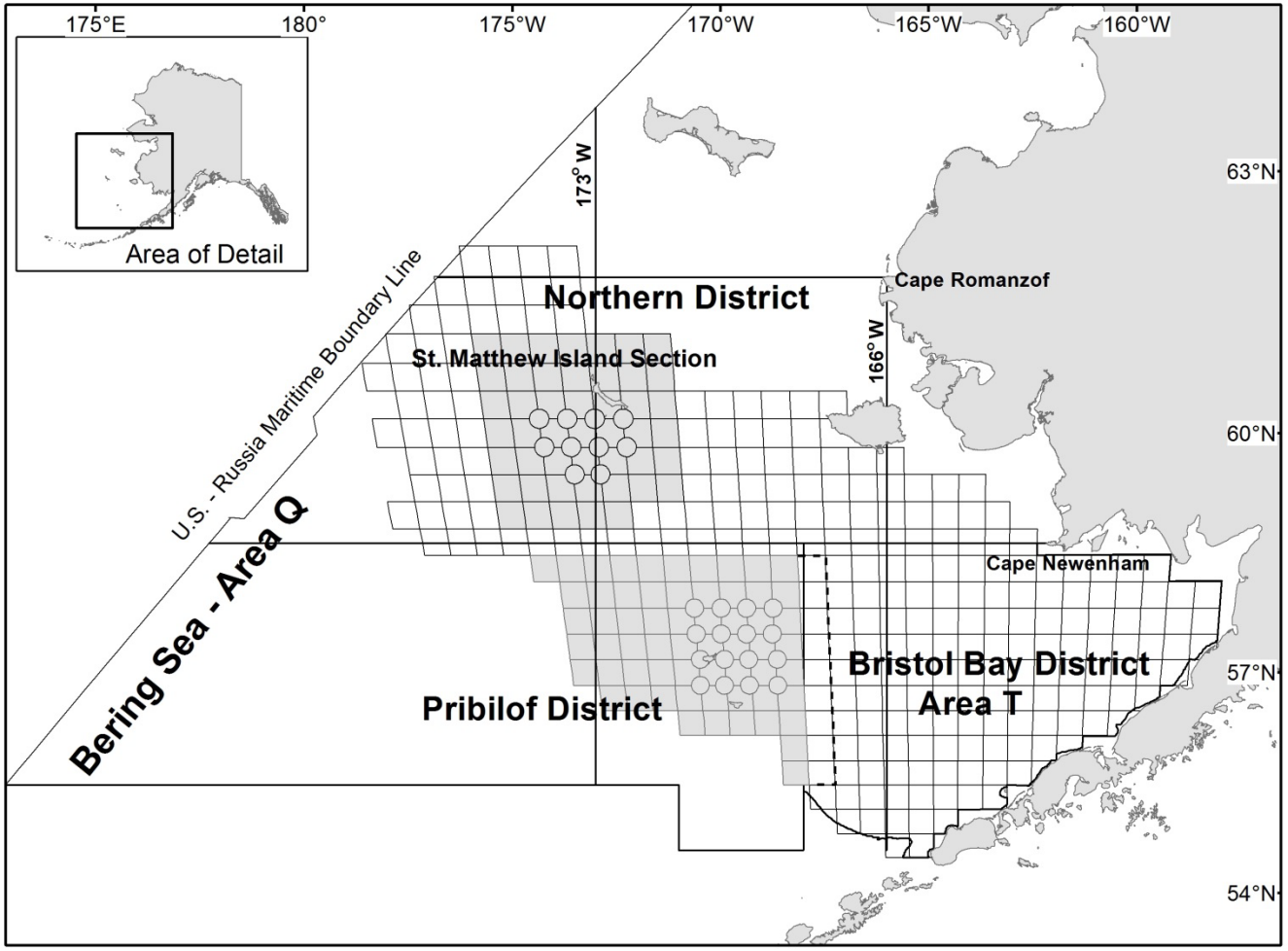

Figure 5. -- Alaska Department of Fish and Game commercial crab management units within the 2015 eastern Bering Sea bottom trawl survey area. Grey areas represent stations included in the Pribilof District (dashed line indicates expanded stock boundary) and St. Matthew Island Section, Northern District sampling strata and circles represent the high-density sampling areas.

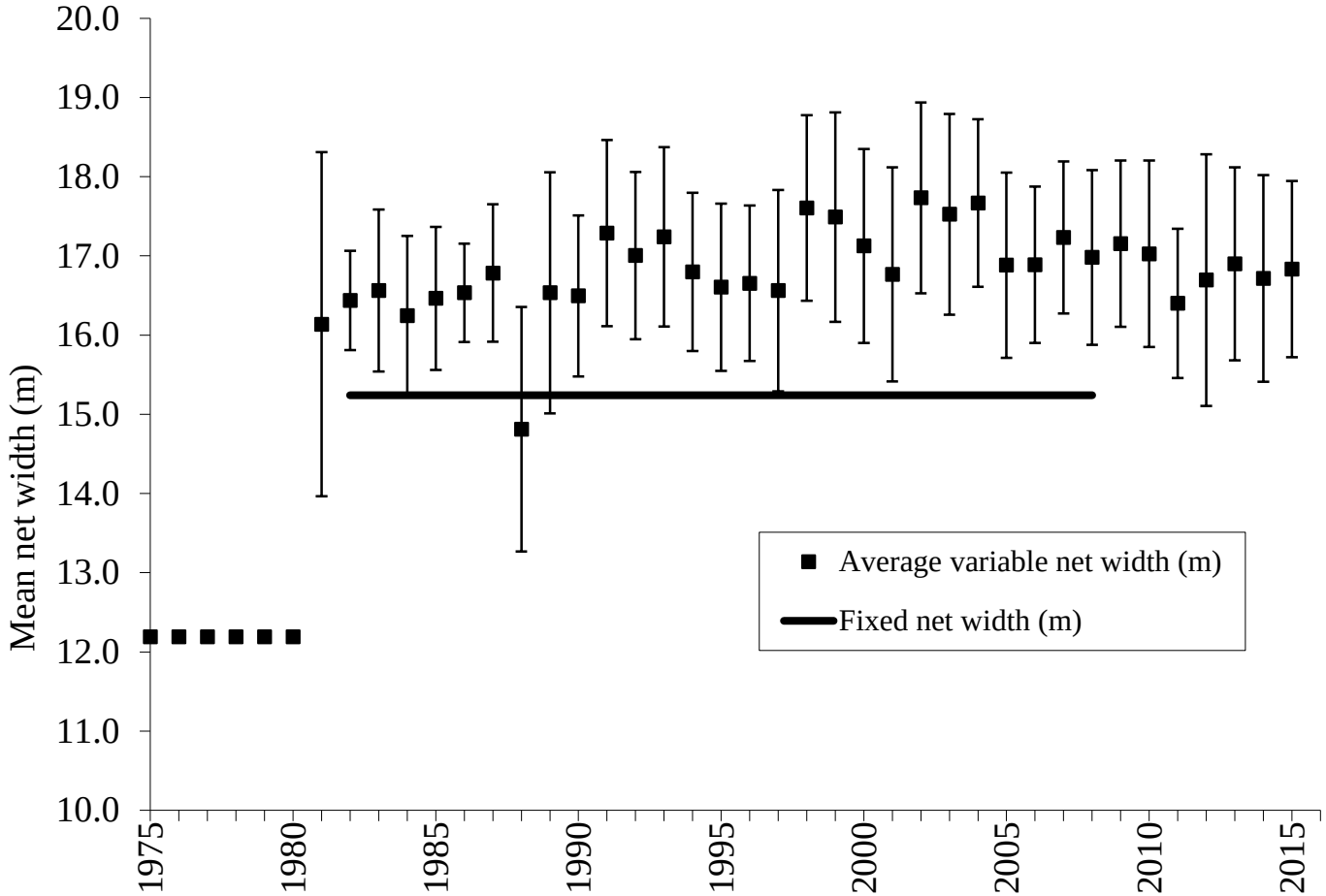

Figure 6. -- Fixed and average variable net widths (± SD) used to calculate area swept by National Marine Fisheries Service eastern Bering Sea standard bottom trawls from 1975 to the present.

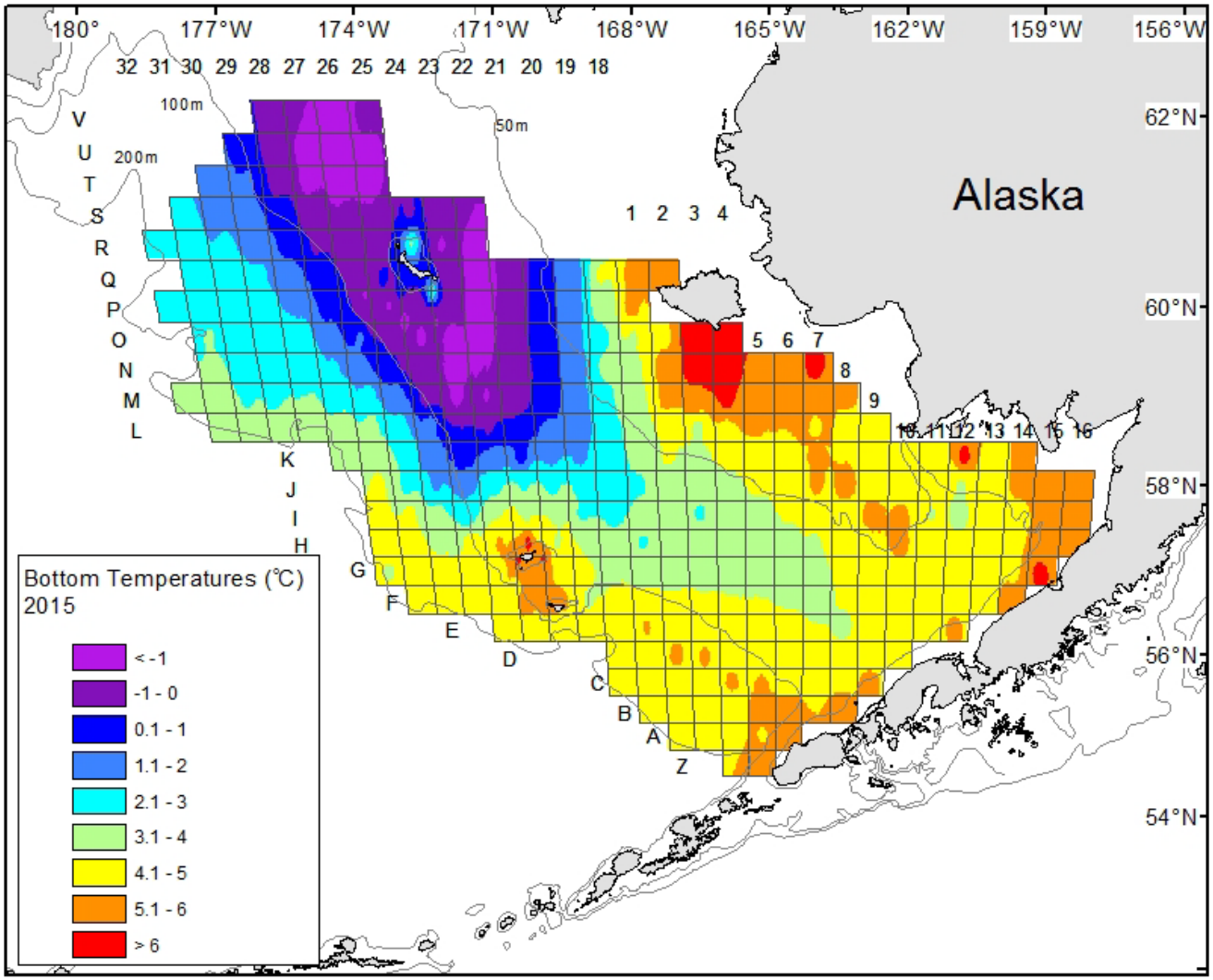

Figure 7. -- Bottom temperatures (°C) measured at stations from the National Marine Fisheries Service eastern Bering Sea bottom trawl survey, beginning 2 June 2015 in Bristol Bay and ending on 29 July 2015 at the western edge of the survey.

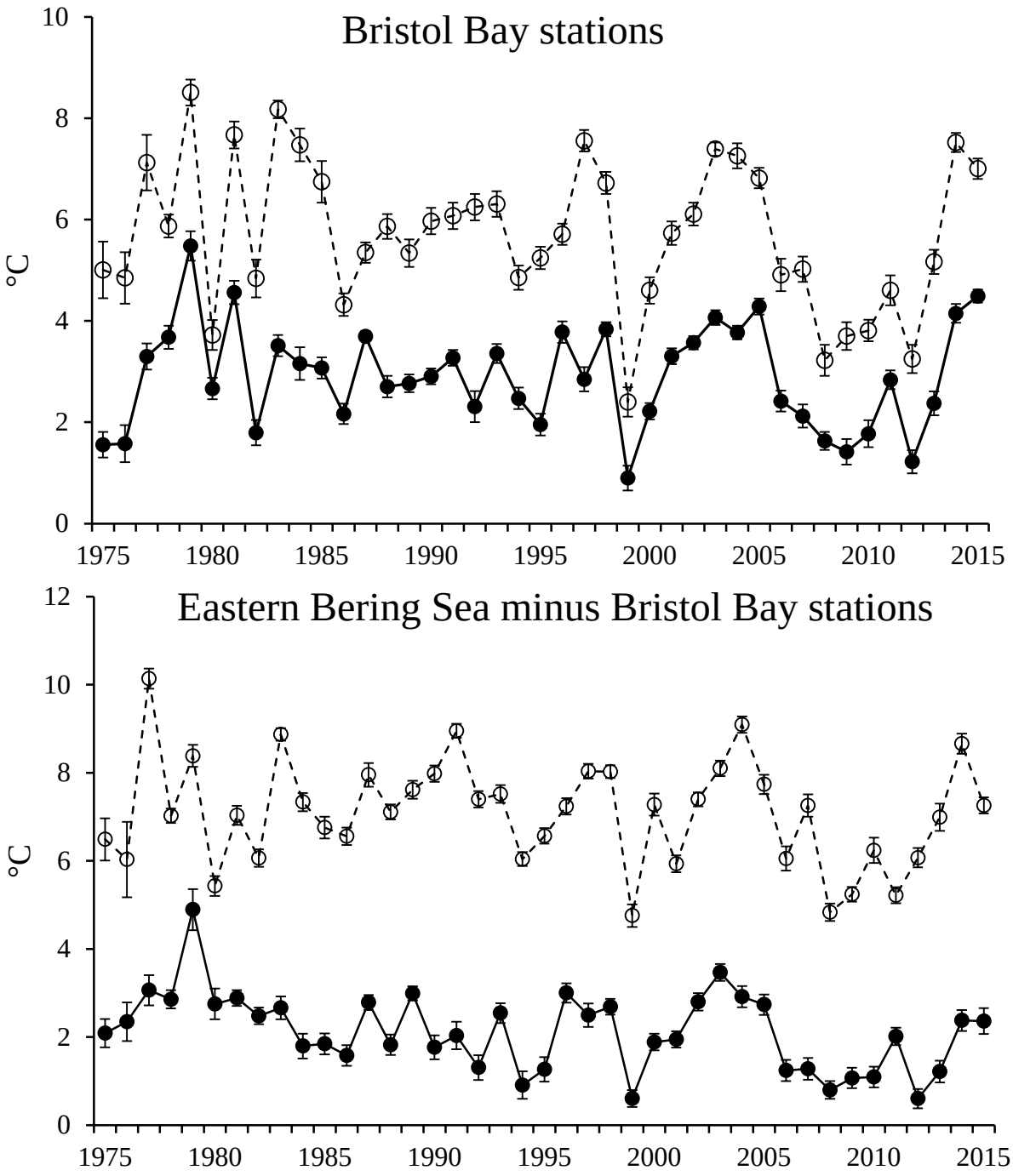

Figure 8. -- Average (± 95% CI) bottom (filled circle, solid line) and surface (open circle, dashed line) temperatures for Bristol Bay stations and the rest of the eastern Bering Sea during the National Marine Fisheries Service's eastern Bering Sea bottom trawl survey. The number of stations used to calculate averages was inconsistent among years, particularly as the survey boundary expanded from 1975 to 1987.

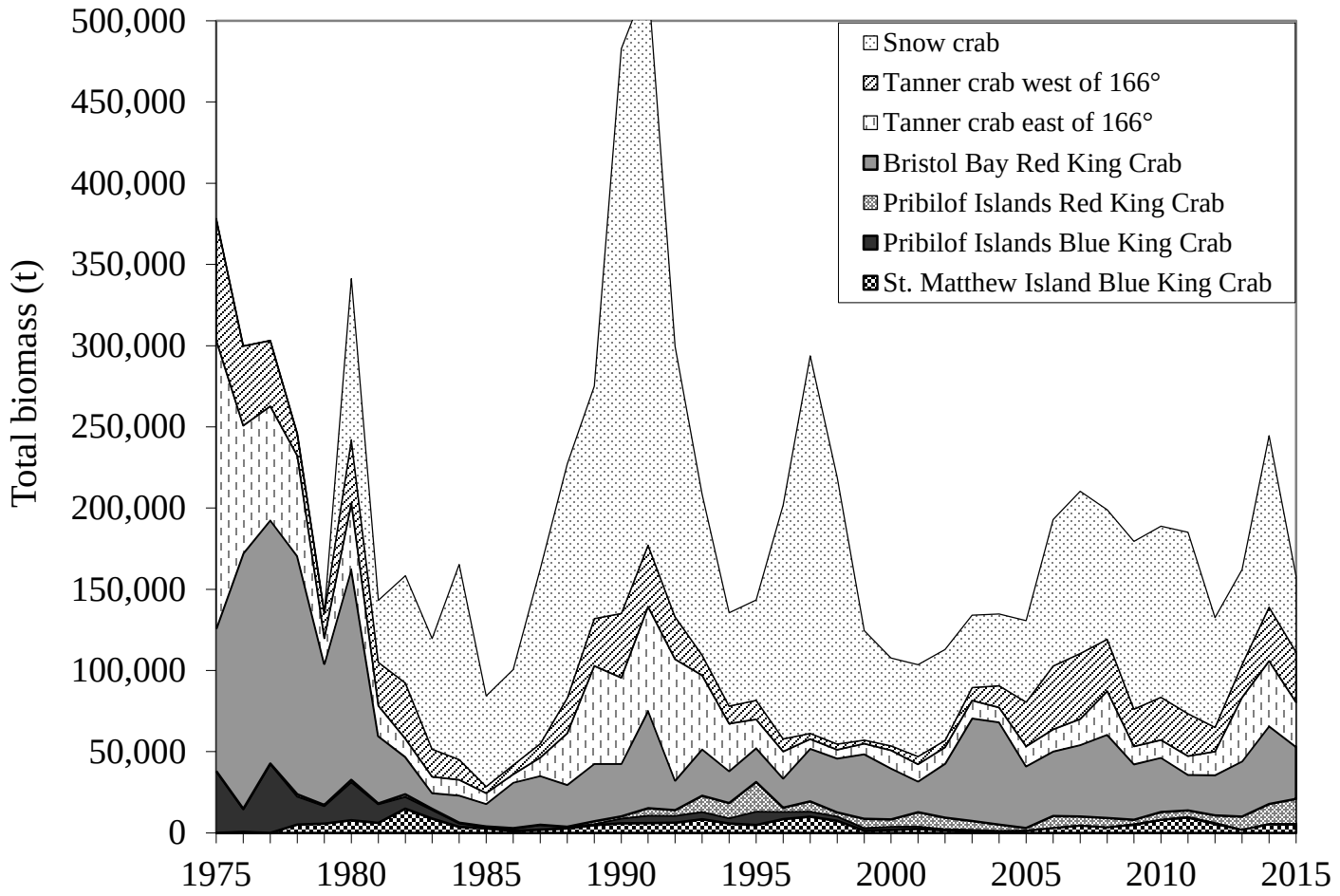

Figure 9. -- Historical mature male biomass for six commercial species caught on National Marine Fisheries Service eastern Bering Sea bottom trawl surveys.

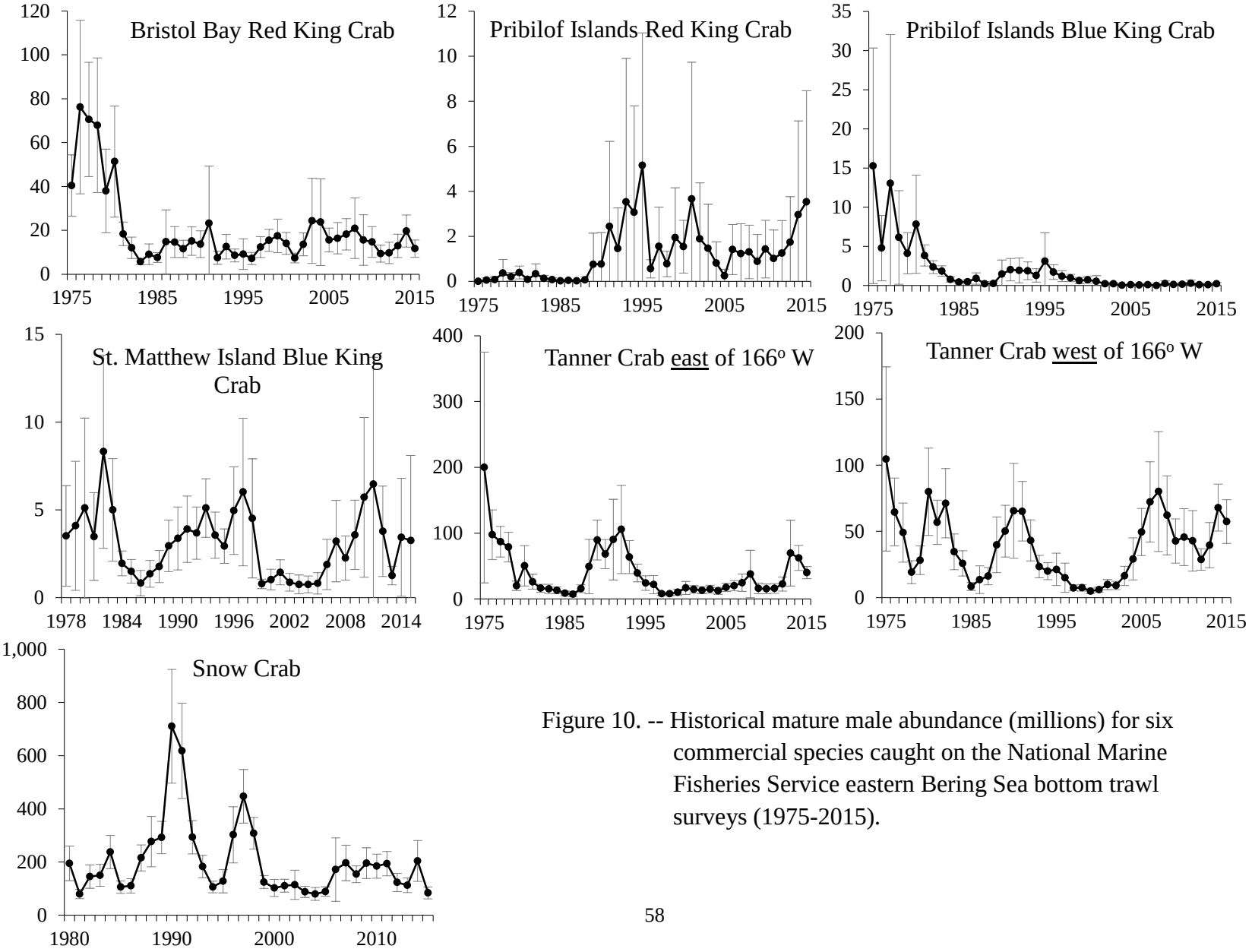

Figure 10. -- Historical mature male abundance (millions) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl surveys (1975-2015).

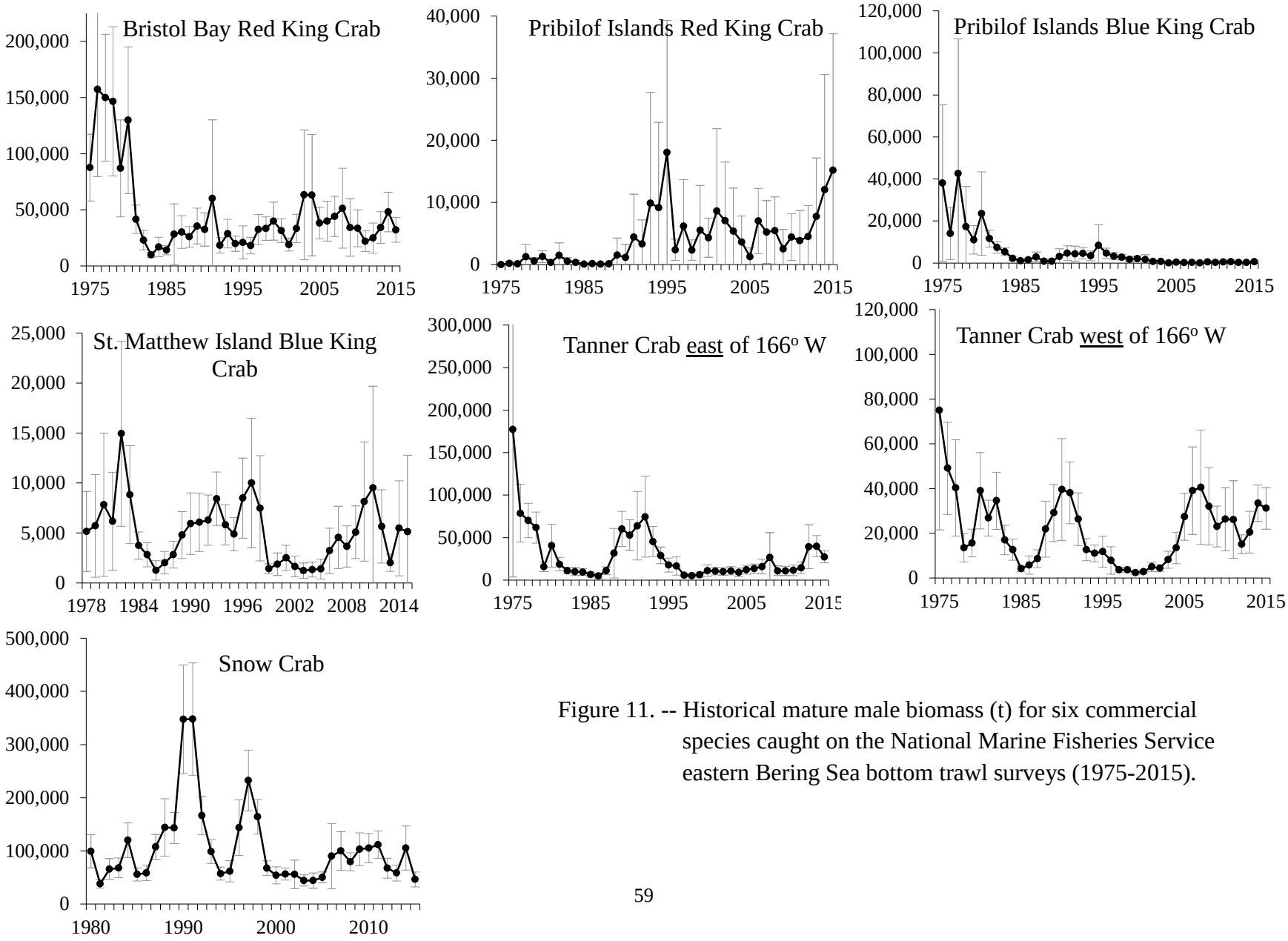

Figure 11. -- Historical mature male biomass (t) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl surveys (1975-2015).

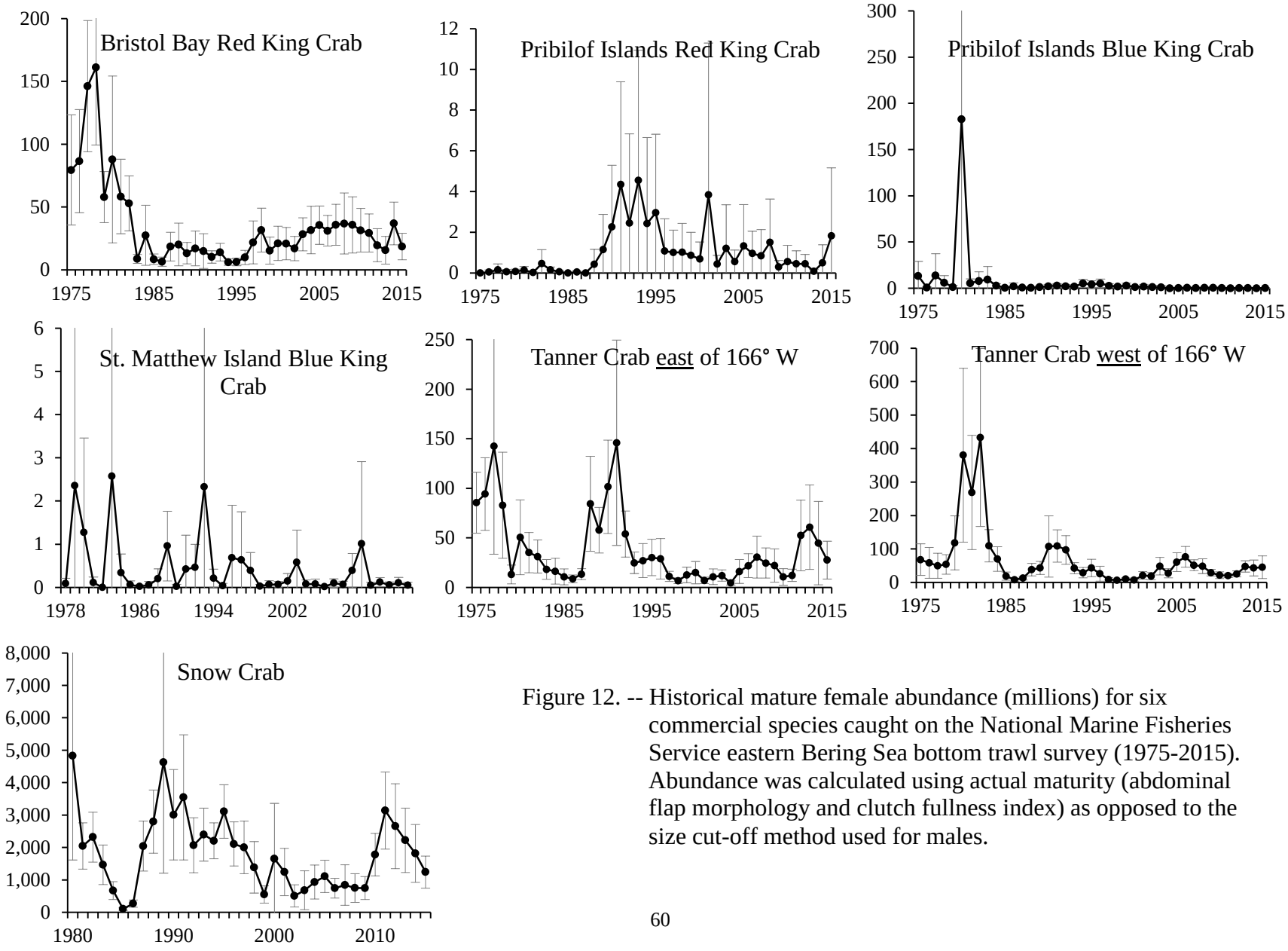

Figure 12. -- Historical mature female abundance (millions) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey (1975-2015). Abundance was calculated using actual maturity (abdominal flap morphology and clutch fullness index) as opposed to the size cut-off method used for males.

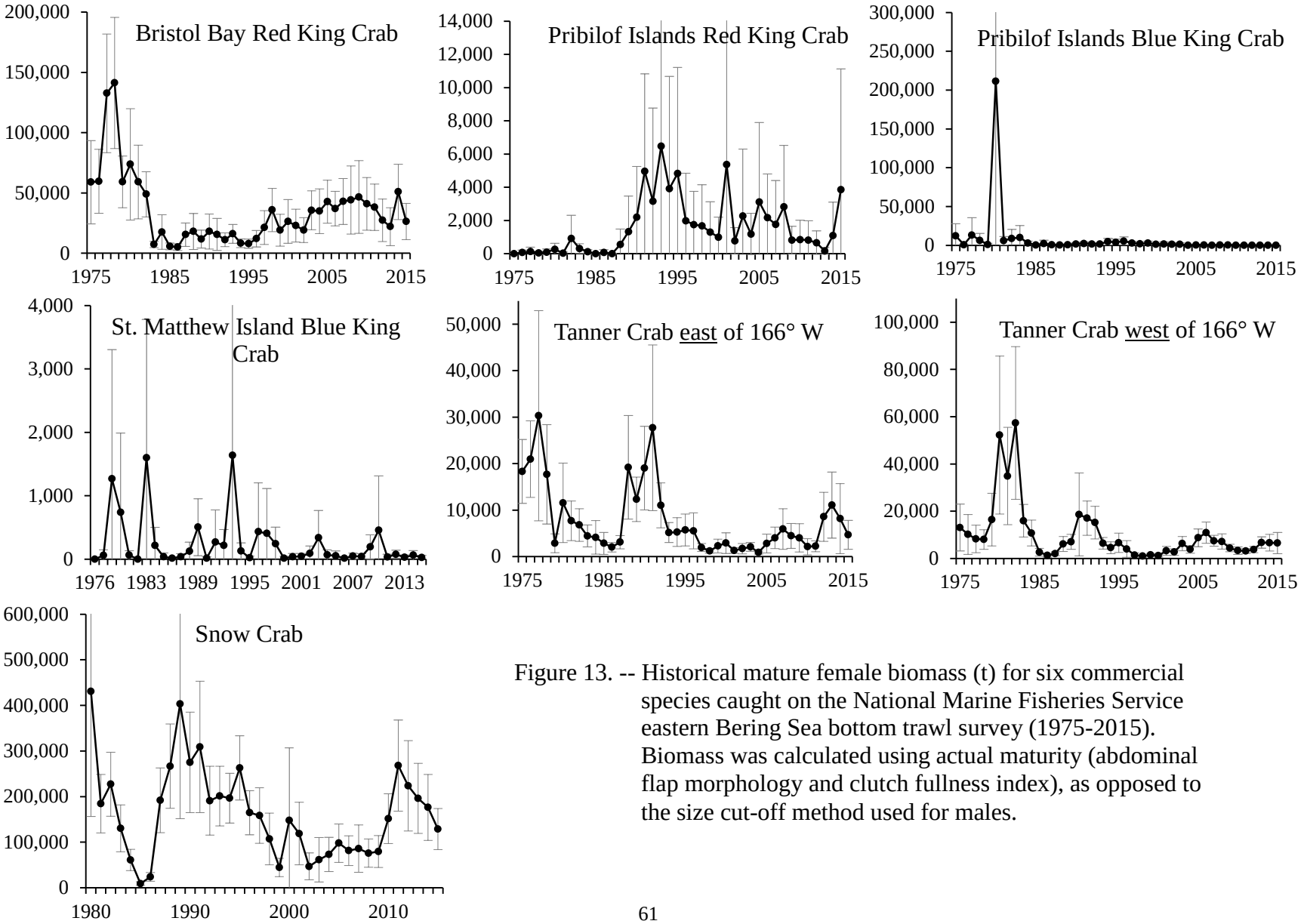

Figure 13. -- Historical mature female biomass (t) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey (1975-2015). Biomass was calculated using actual maturity (abdominal flap morphology and clutch fullness index), as opposed to the size cut-off method used for males.

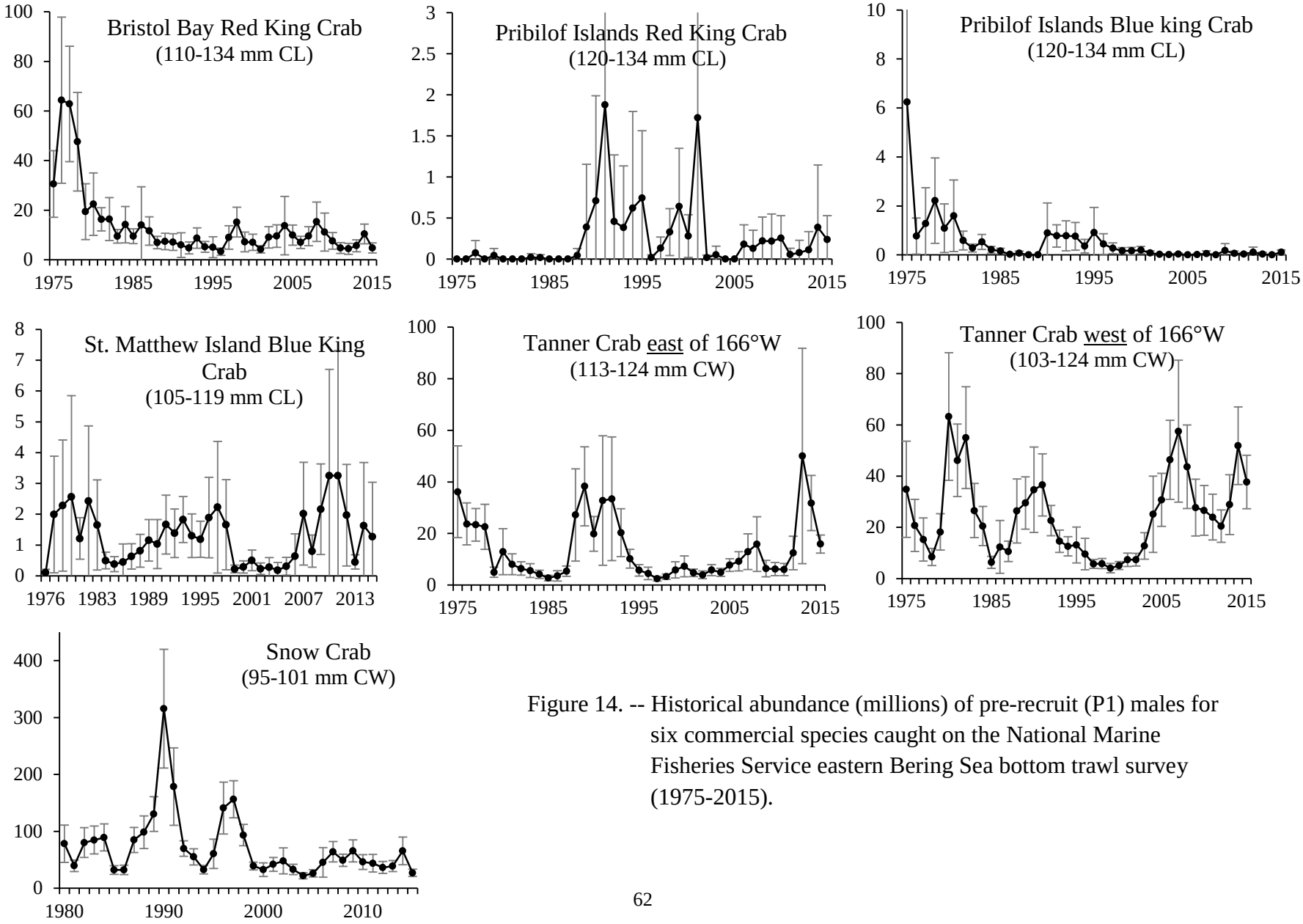

Figure 14. -- Historical abundance (millions) of pre-recruit (P1) males for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey (1975-2015).

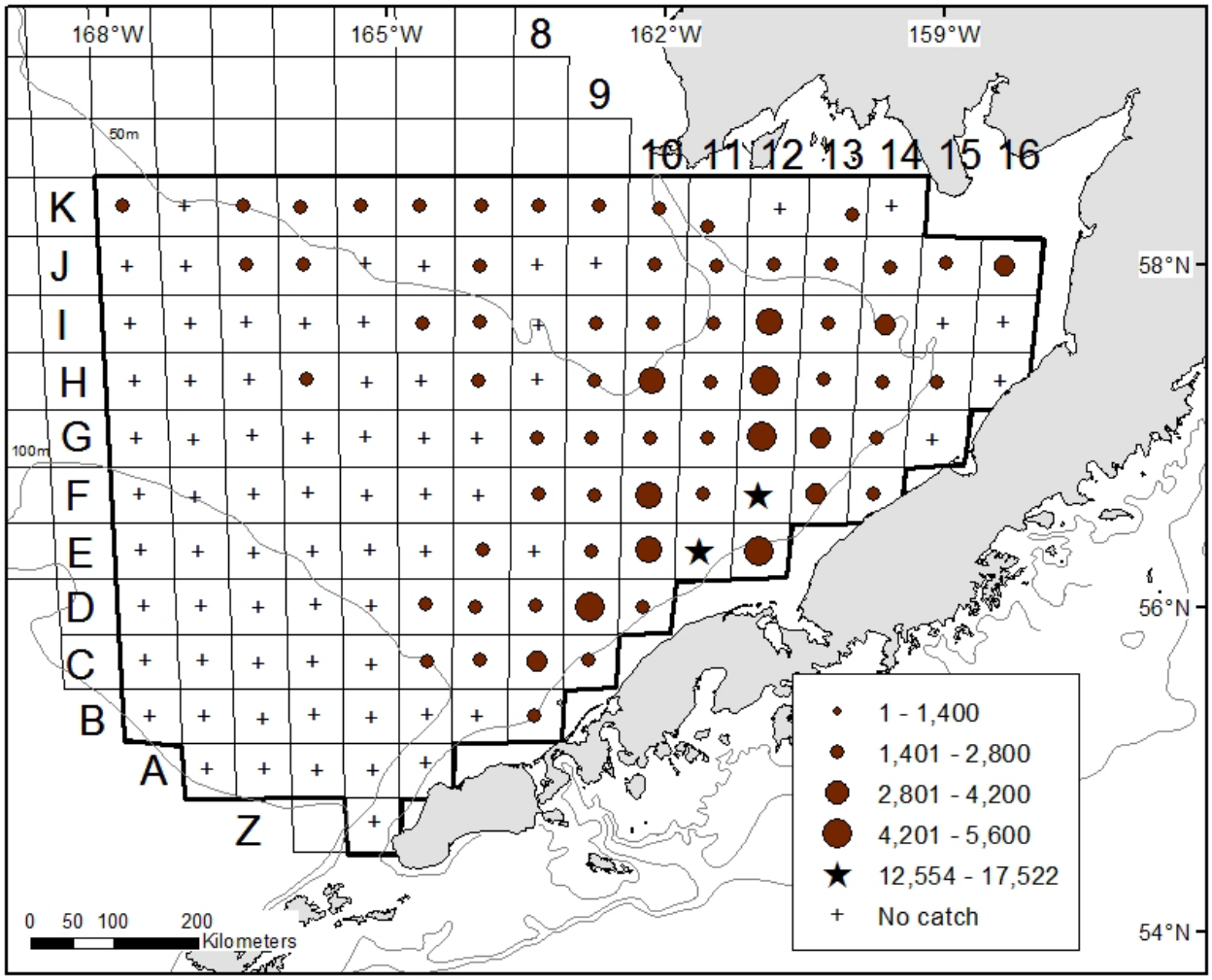

Figure 15. -- Total density (number nmi^{-2}) of red king crab (*Paralithodes camtschaticus*) at each station sampled in the 2015 Bristol Bay District. Data depicted by circles are equal interval densities, while stars represent densities larger than the standard scale. The outlined area depicts the management district.

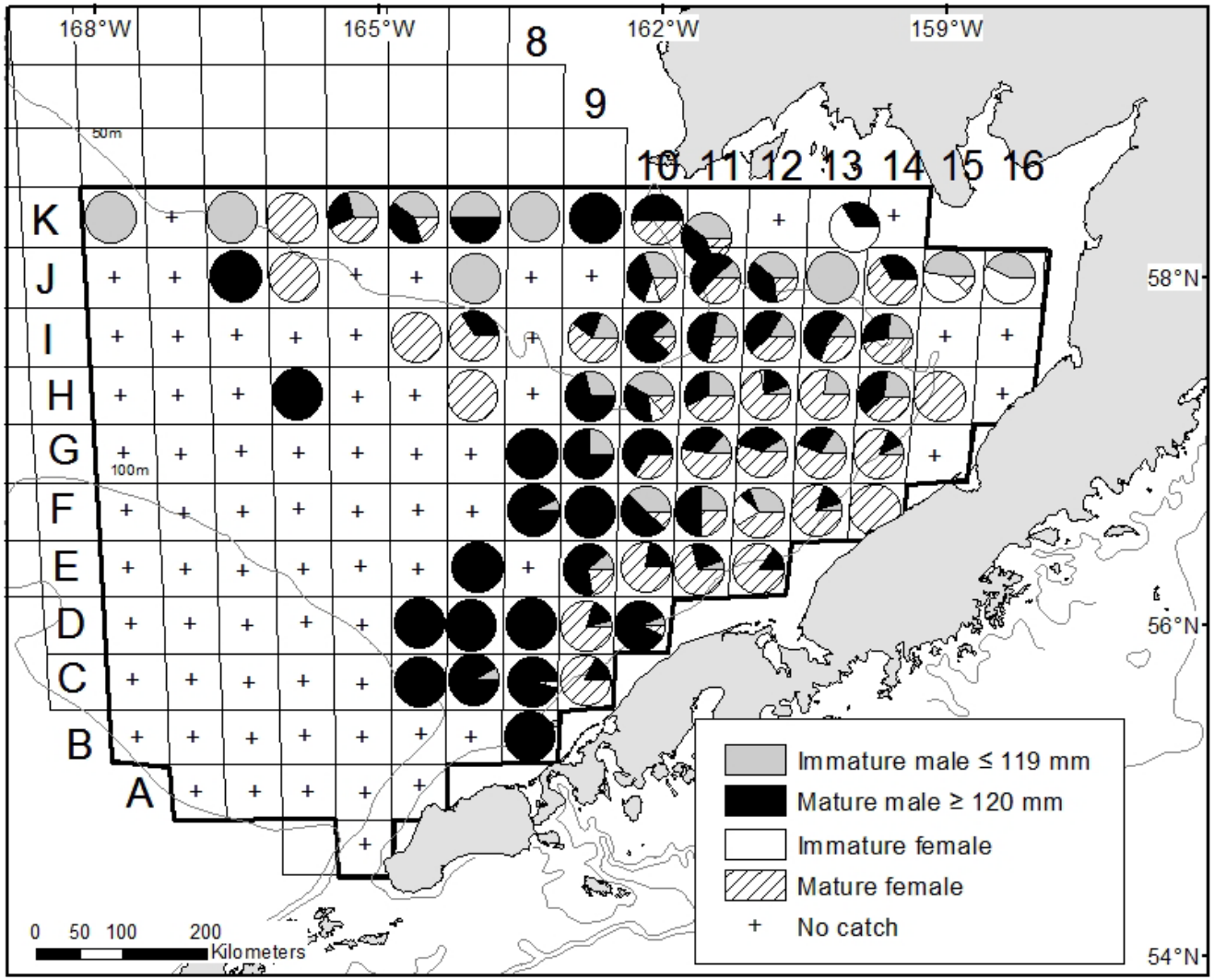

Figure 16. -- Percentage of male and female red king crab (*Paralithodes camtschaticus*) maturity classes caught at each station of the Bristol Bay District in 2015. The outlined area depicts management district.

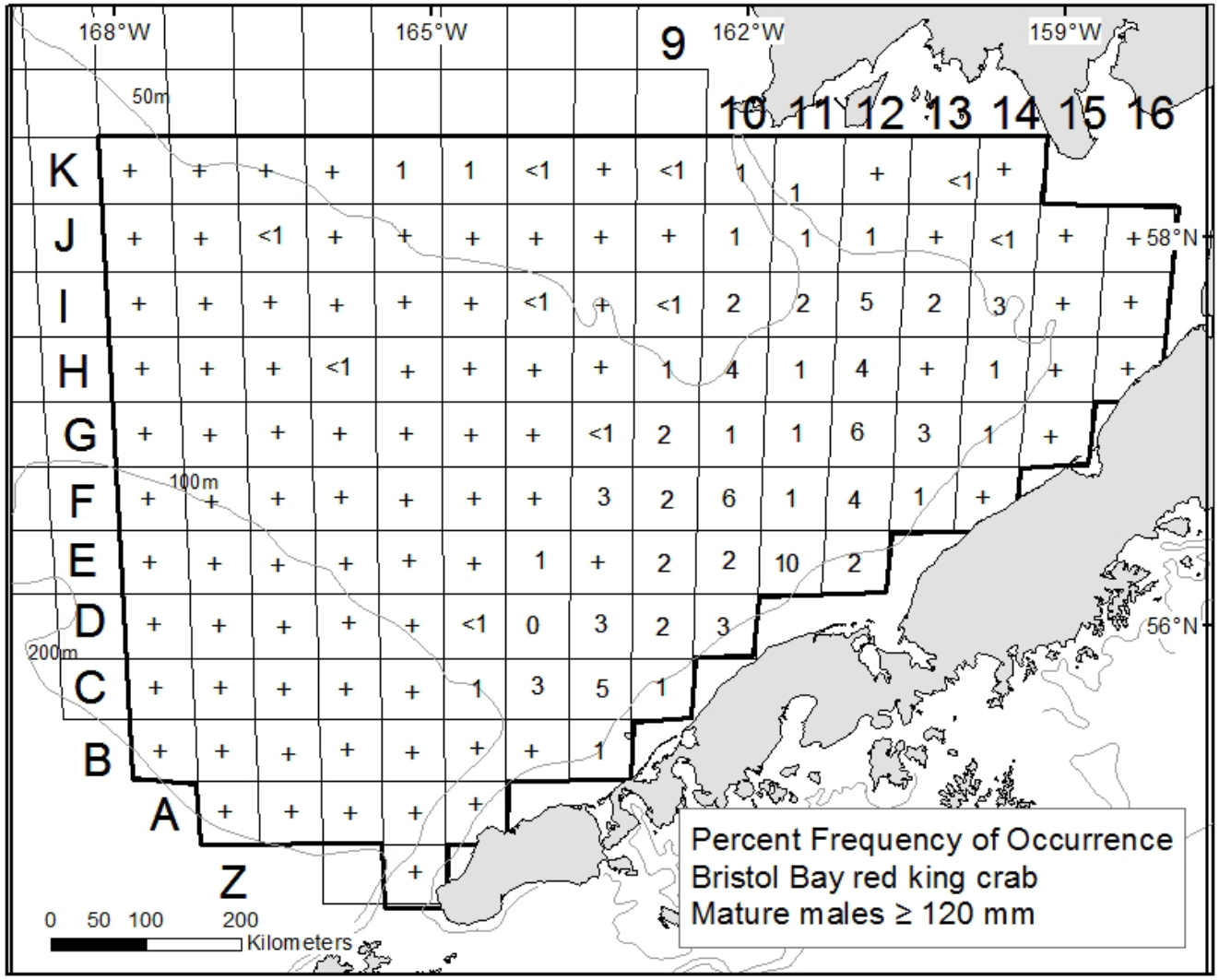

Figure 17. -- Percent frequency of occurrence of mature male red king crab (*Paralithodes camtschaticus*) at stations sampled in the 2015 Bristol Bay District. The outlined area depicts management district.

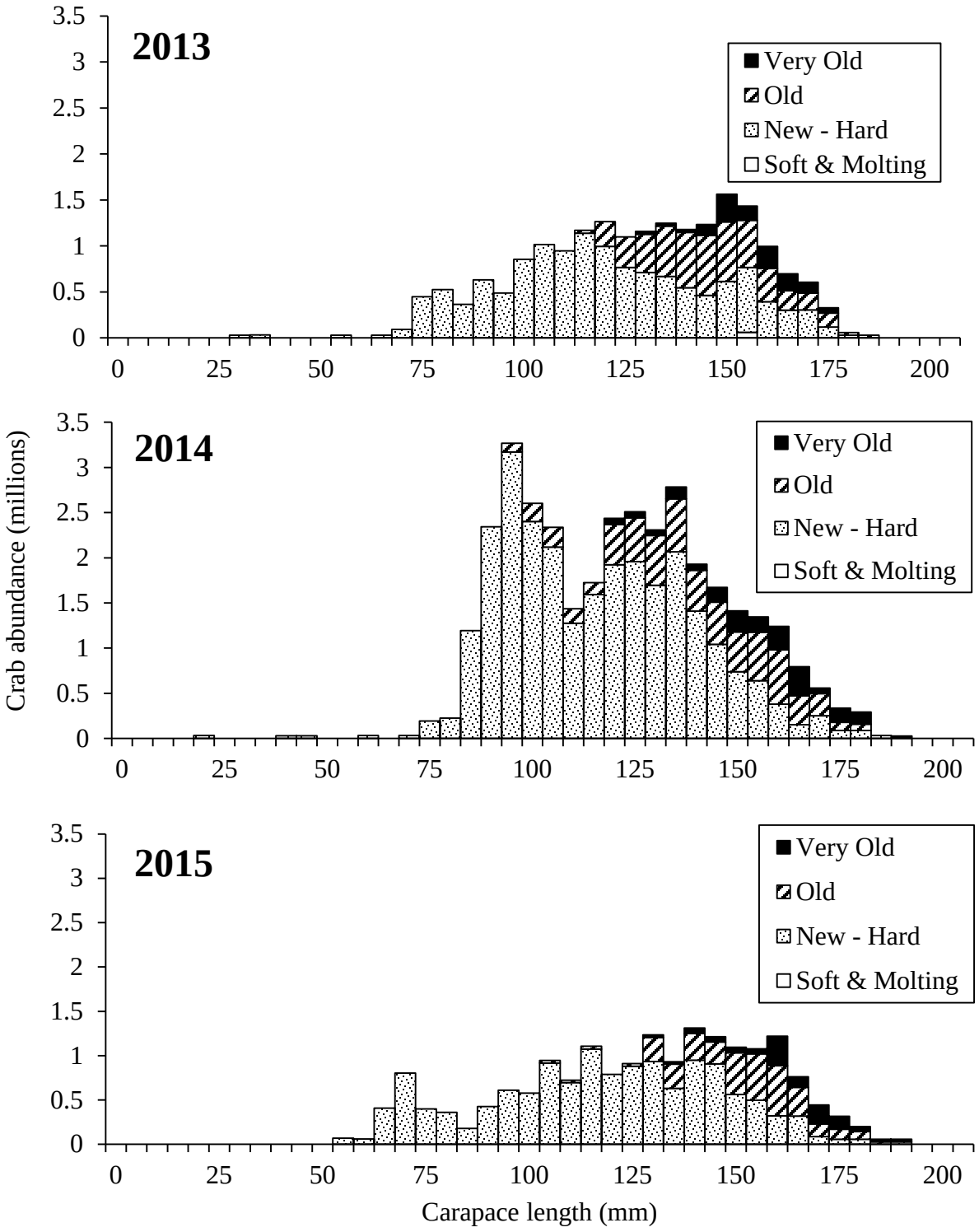

Figure 18. -- Size frequency by shell condition of Bristol Bay District male red king crab (*Paralithodes camtschaticus*) by 5 mm length classes, 2013-2015.

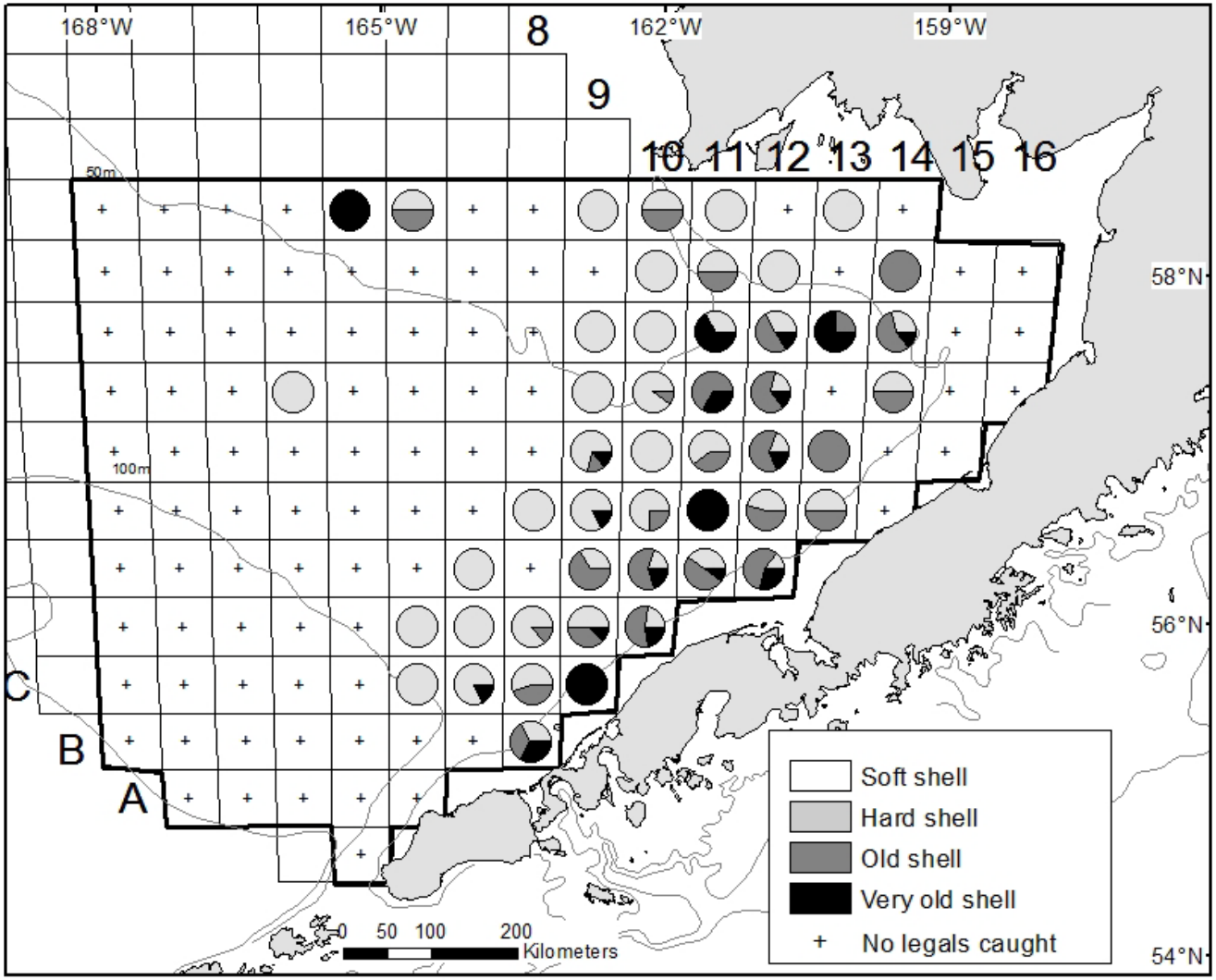

Figure 19. -- Distribution of legal-sized male red king crab (*Paralithodes camtschaticus*) caught at each station in the 2015 Bristol Bay District distinguished by shell condition. The outlined area depicts management district.

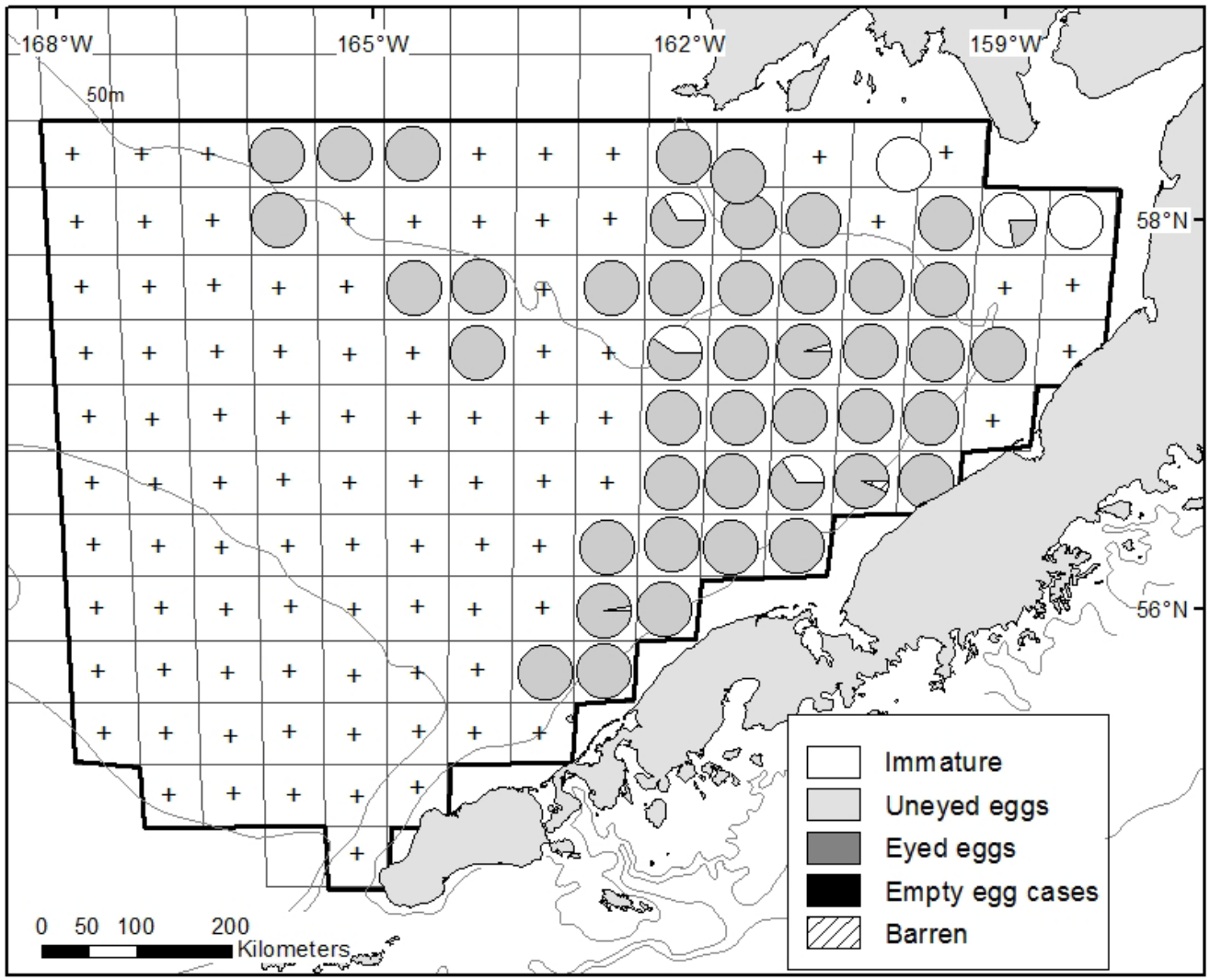

Figure 20. -- Distribution and egg condition of female red king crab (*Paralithodes camtschaticus*) in the Bristol Bay District in 2015. The outlined area depicts management district.

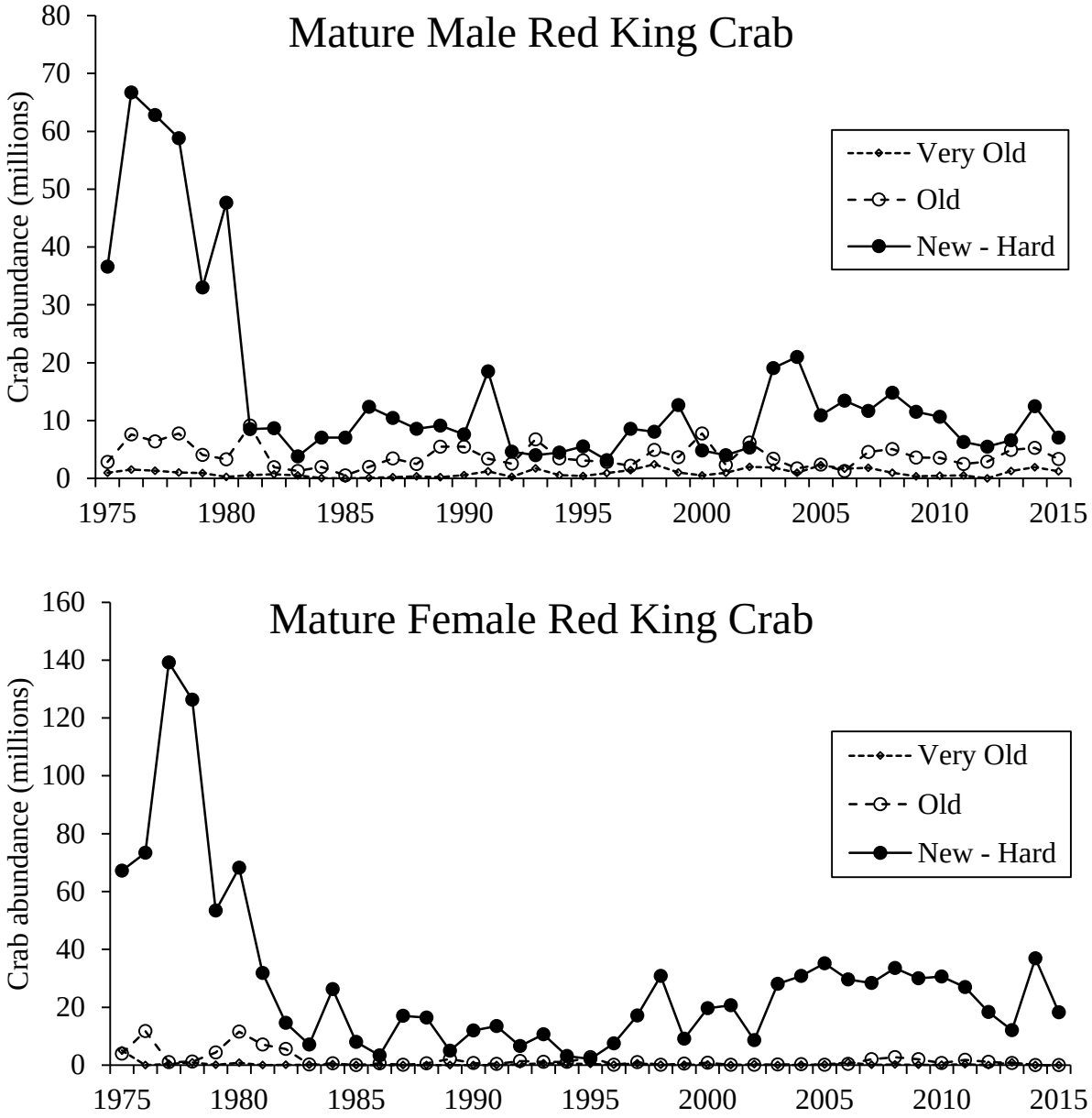

Figure 21. -- Time series of mature male (≥120 mm CL) and female (actual maturity) Bristol Bay District red king crab (*Paralithodes camtschaticus*) by shell condition, 1975-2015. New- Hard = shell condition 2; Old = shell condition 3; Very Old = shell condition 4 and 5 combined.

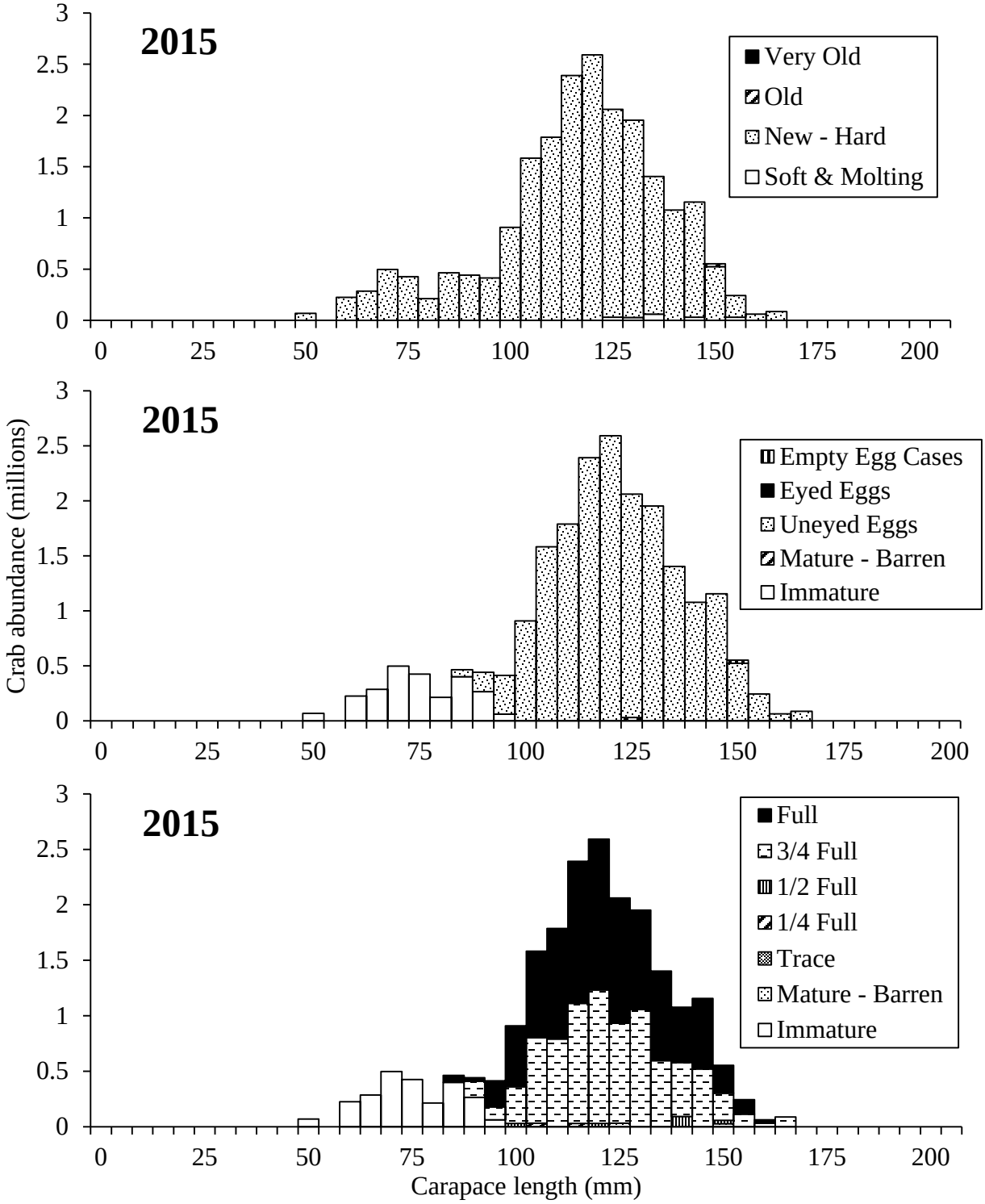

Figure 22. -- Size frequency by shell condition, egg condition, and clutch fullness of Bristol Bay District female red king crab (*Paralithodes camtschaticus*) by 5 mm length classes in 2015.

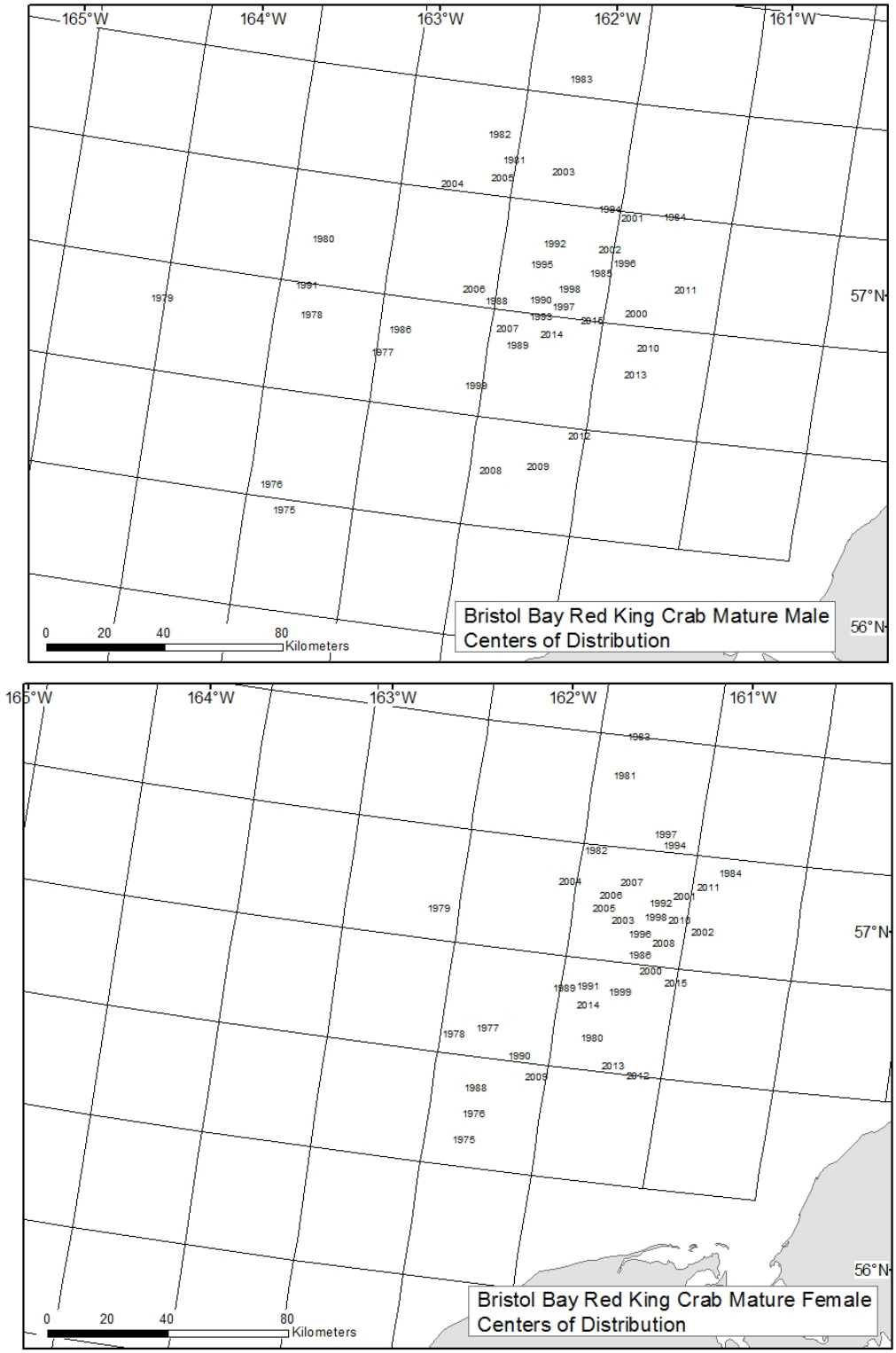

Figure 23. -- Centers of stock distribution of Bristol Bay District male and female red king crab (*Paralithodes camtschaticus*) from 1975 to 2015.

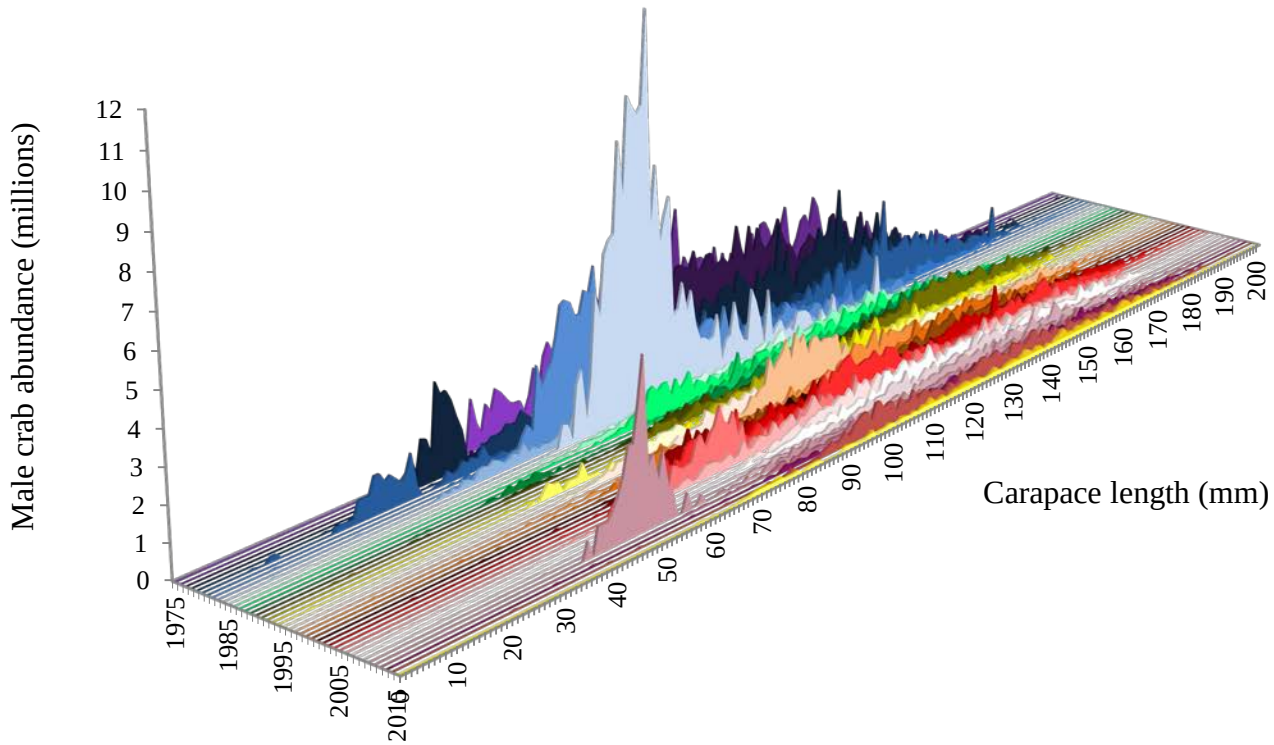

Figure 24. -- Historical size frequency by 1 mm length classes of Bristol Bay District male red king crab (*Paralithodes camtschaticus*), 1975 to 2015.

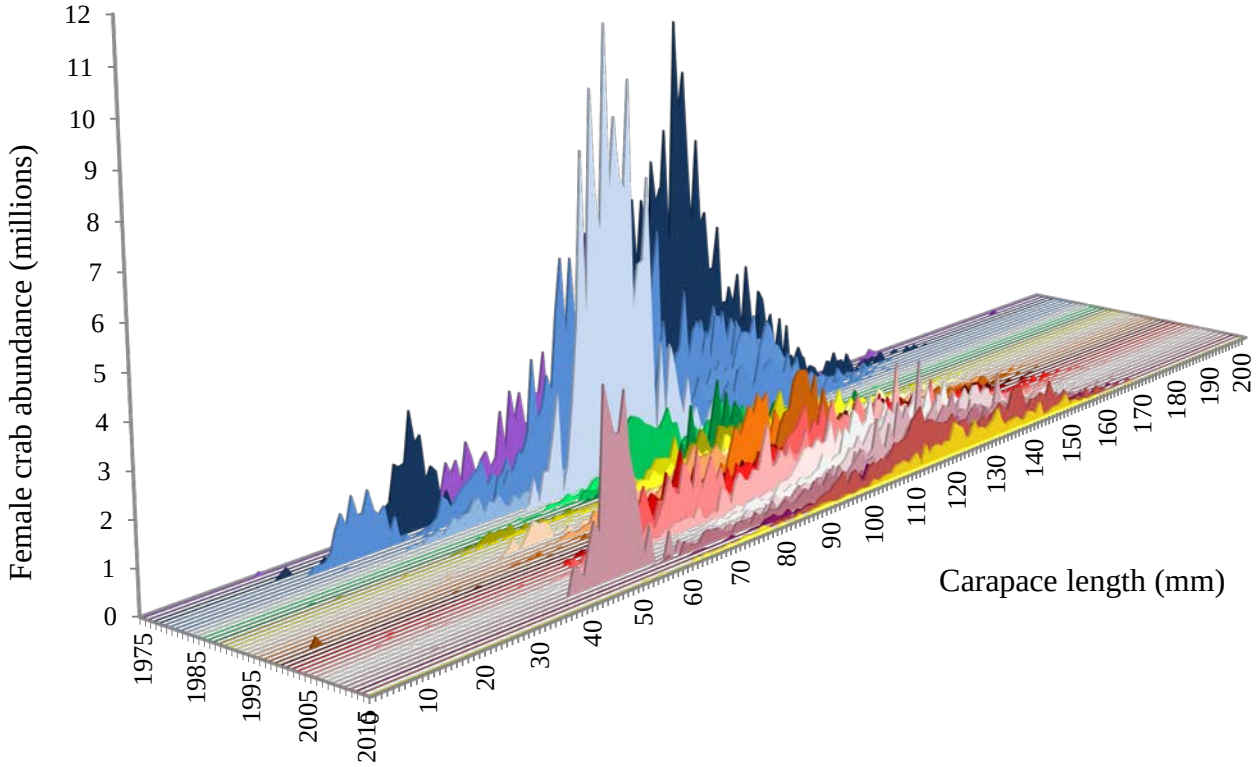

Figure 25. -- Historical size frequency by 1 mm length classes of Bristol Bay District female red king crab (*Paralithodes camtschaticus*), 1975 to 2015.

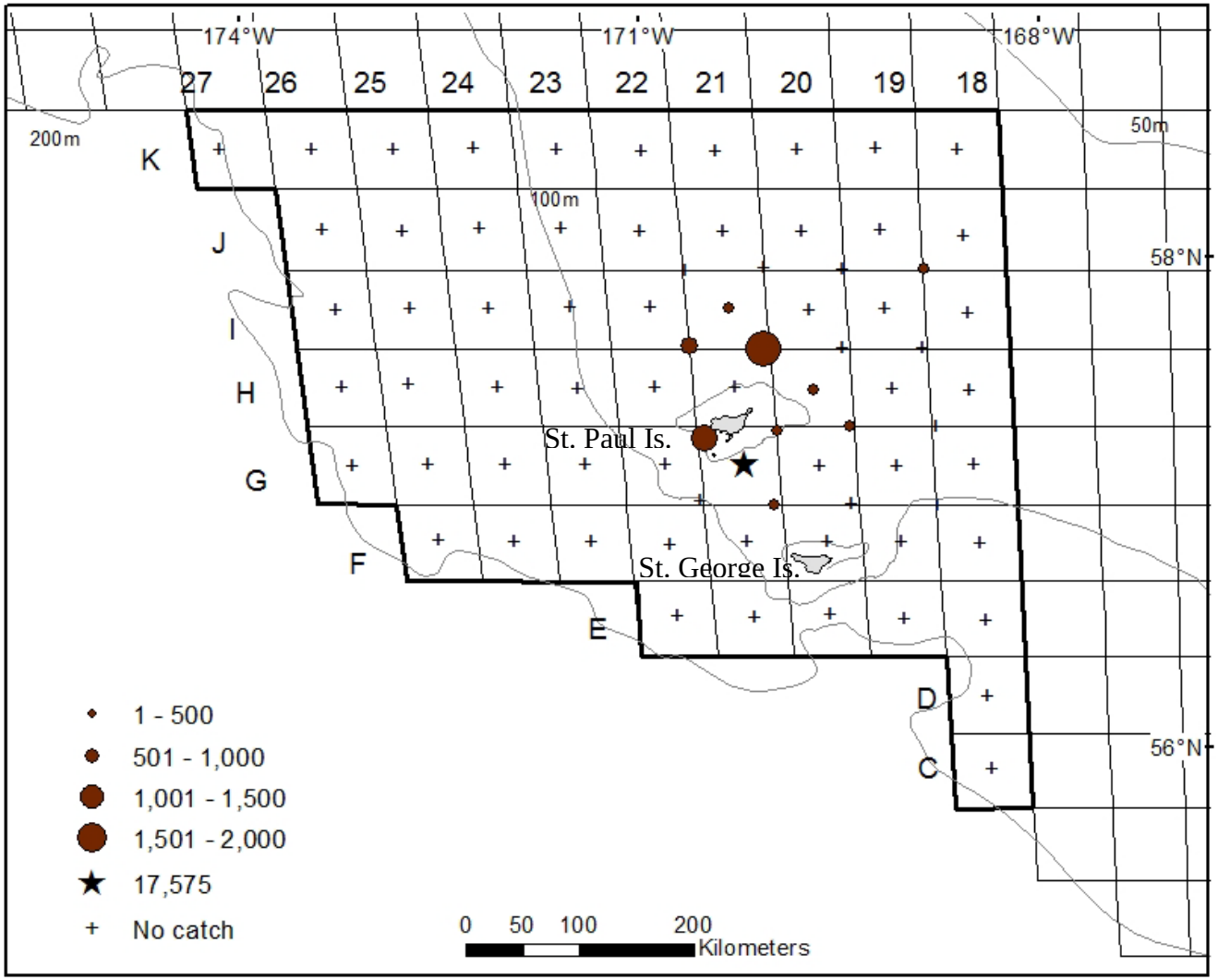

Figure 26. -- Total density (number nmi^{-2}) of red king crab (*Paralithodes camtschaticus*) at each station sampled in the Pribilof District in 2015. Data depicted by circles are equal interval densities, while stars represent densities larger than the standard scale. The outlined area depicts stations within the management district.

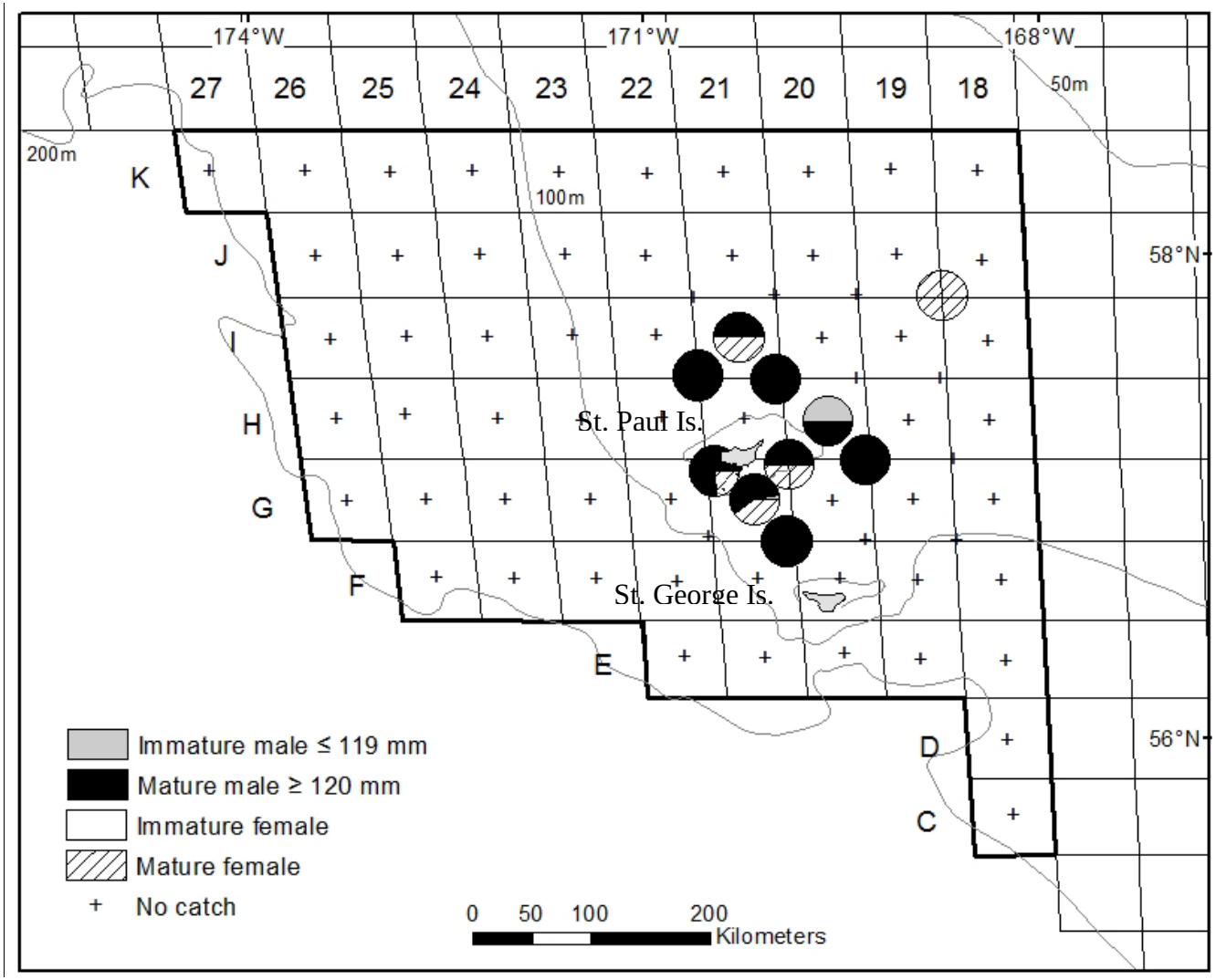

Figure 27. -- Percentage of male and female red king crab (*Paralithodes camtschaticus*) maturity classes at each station of the Pribilof District in 2015. The outlined area depicts stations within the management district.

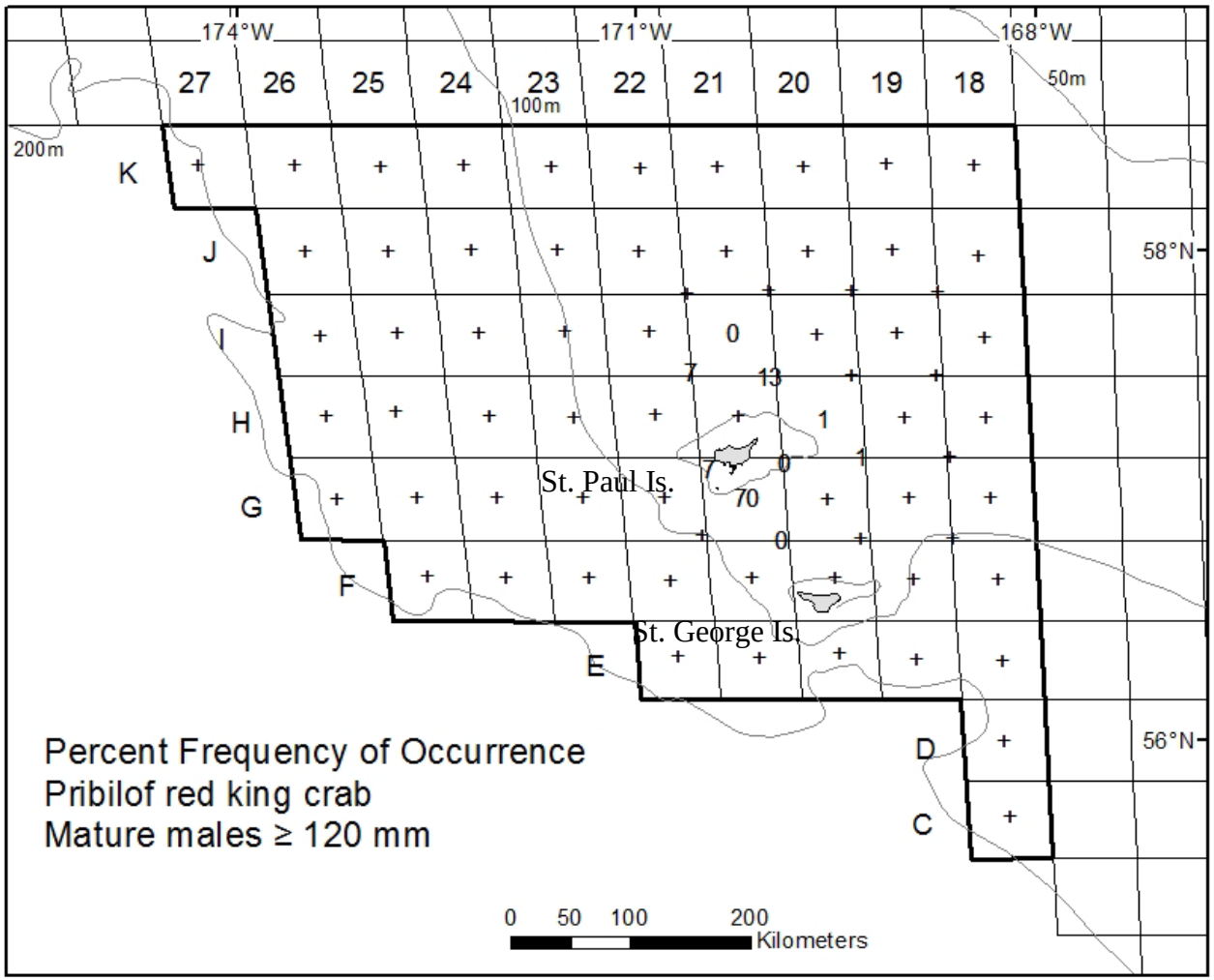

Figure 28. -- Percent frequency of occurrence of mature male red king crab (*Paralithodes camtschaticus*) at stations sampled in the 2015 Pribilof District.

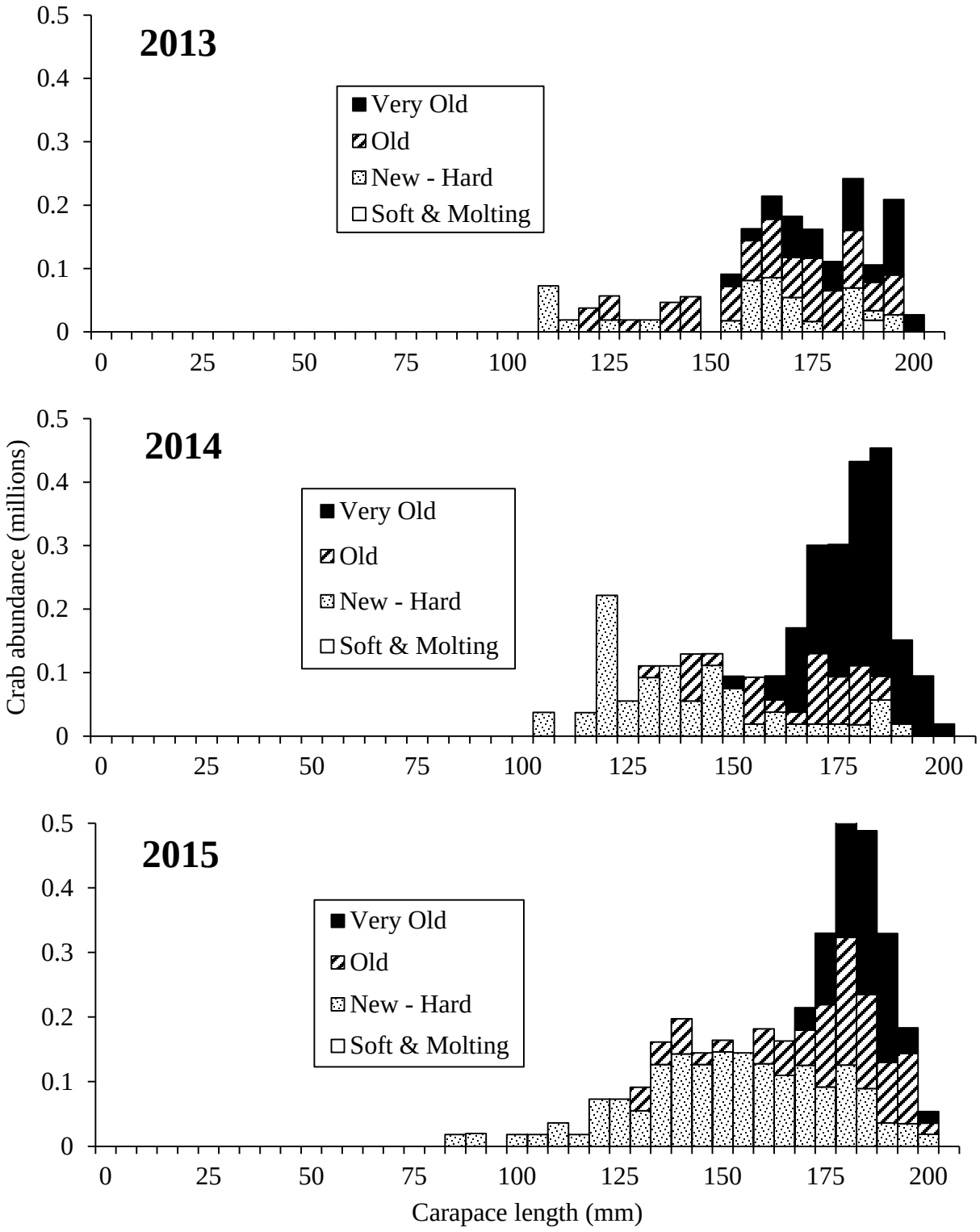

Figure 29. -- Size frequency by shell condition of Pribilof District male red king crab (*Paralithodes camtschaticus*) by 5 mm length classes, 2013-2015.

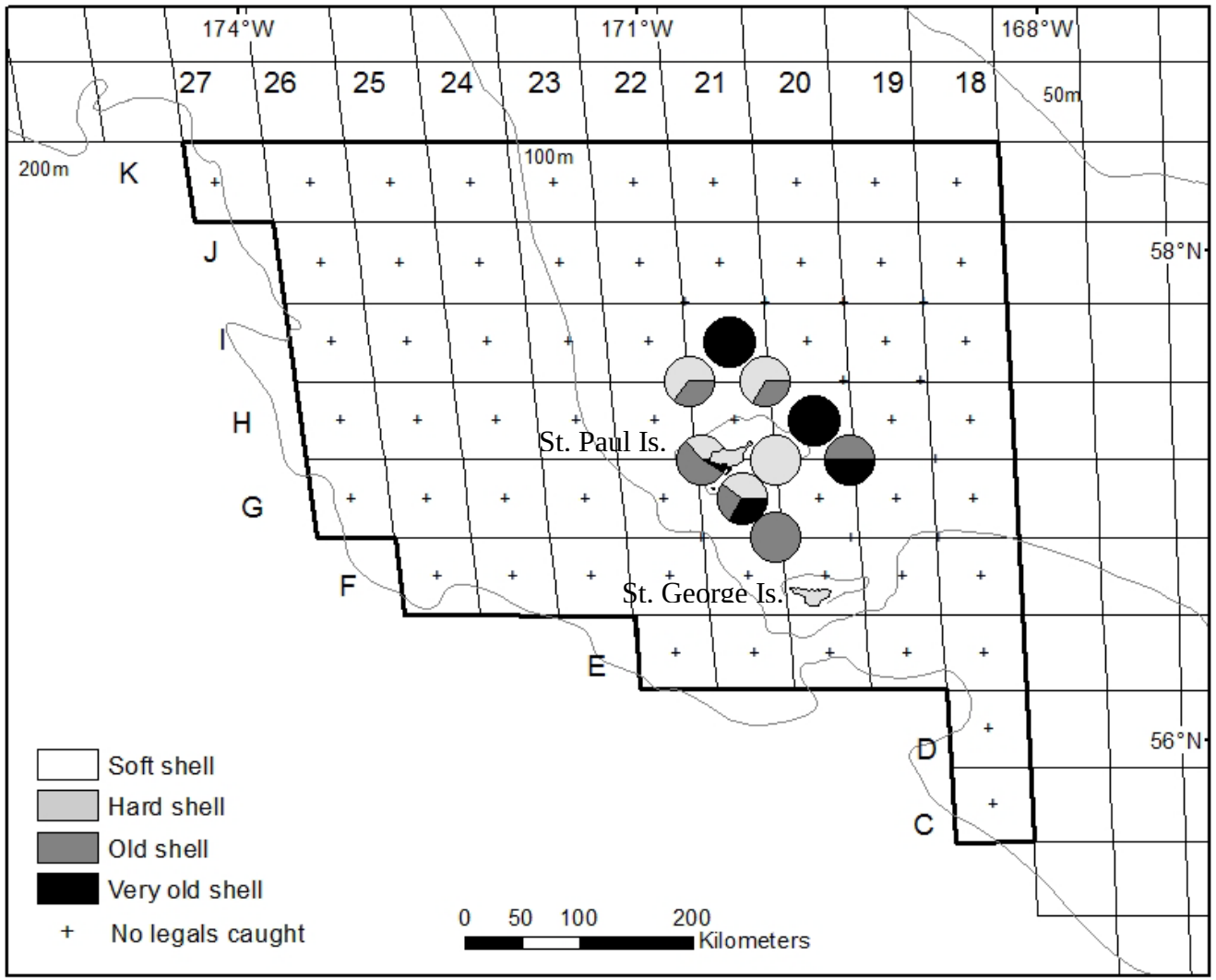

Figure 30. -- Distribution of legal-sized male red king crab (*Paralithodes camtschaticus*) caught at each station of the Pribilof District in 2015 and distinguished by shell condition. The outlined area depicts stations within the management district.

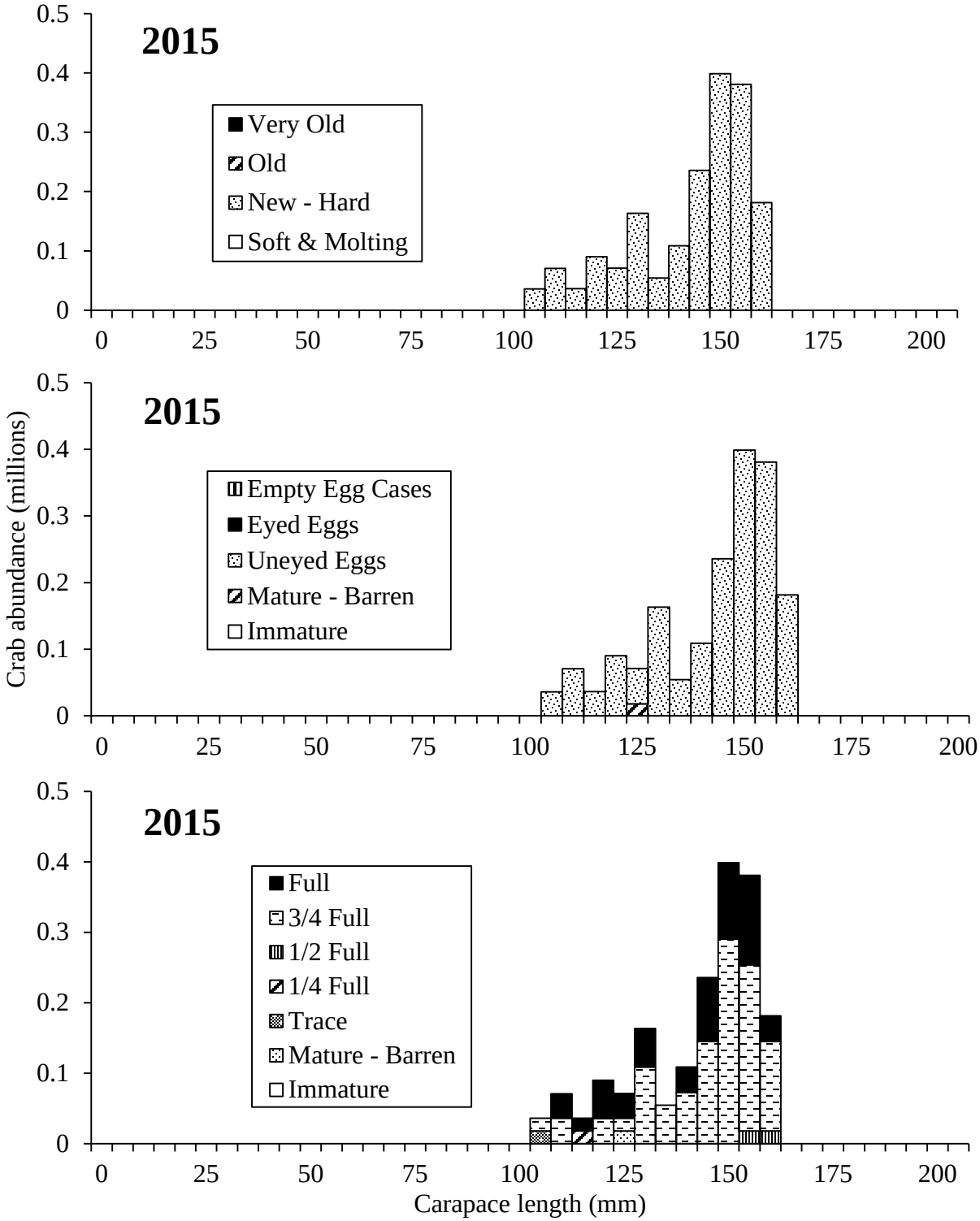

Figure 31. -- Size frequency by shell condition, egg condition, and clutch fullness of Pribilof District female red king crab (*Paralithodes camtschaticus*) by 5 mm length classes in 2015.

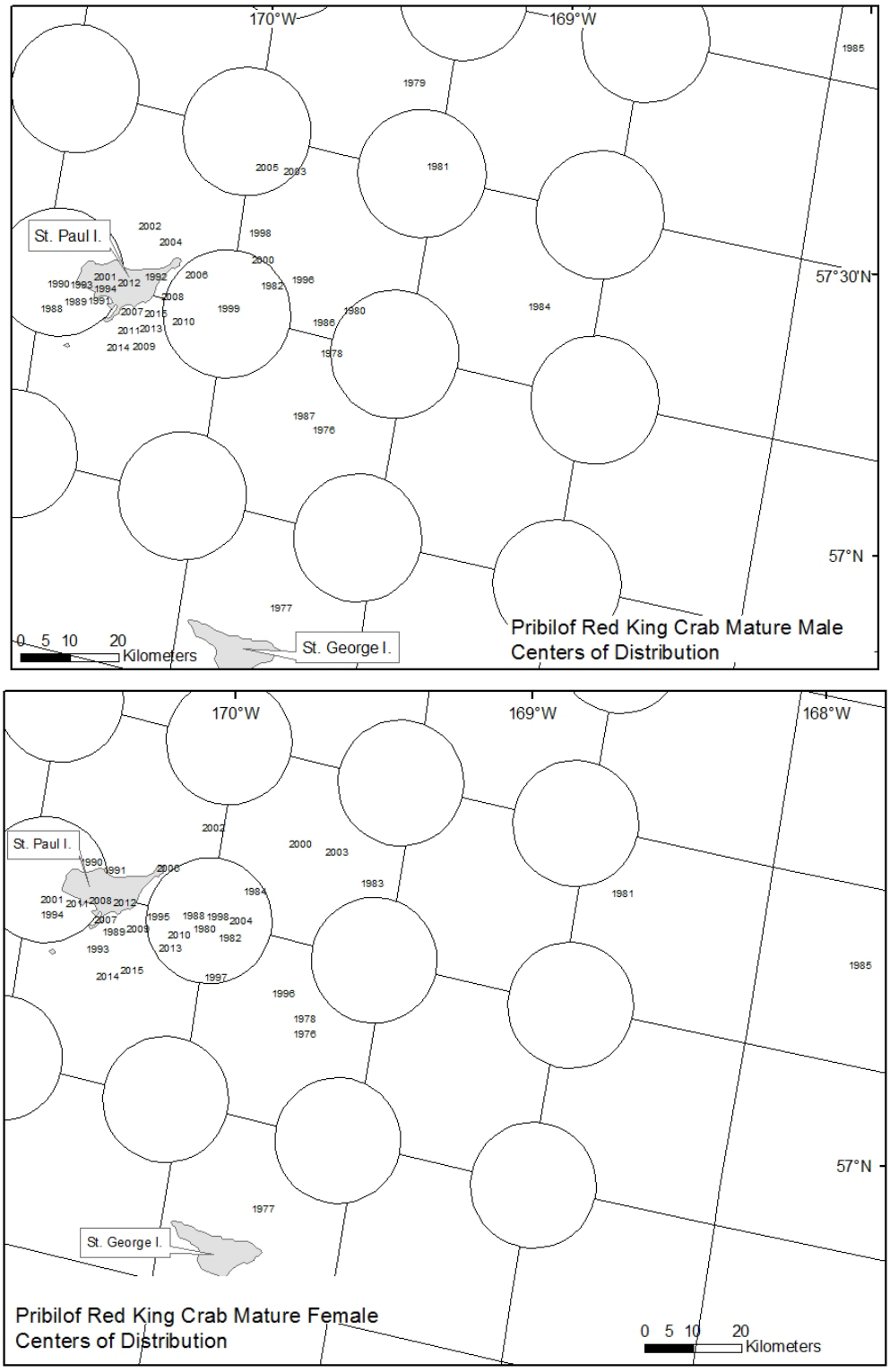

Figure 32. -- Centers of stock distribution of Pribilof Islands male and female red king crab (*Paralithodes camtschaticus*) from 1975 to 2015.

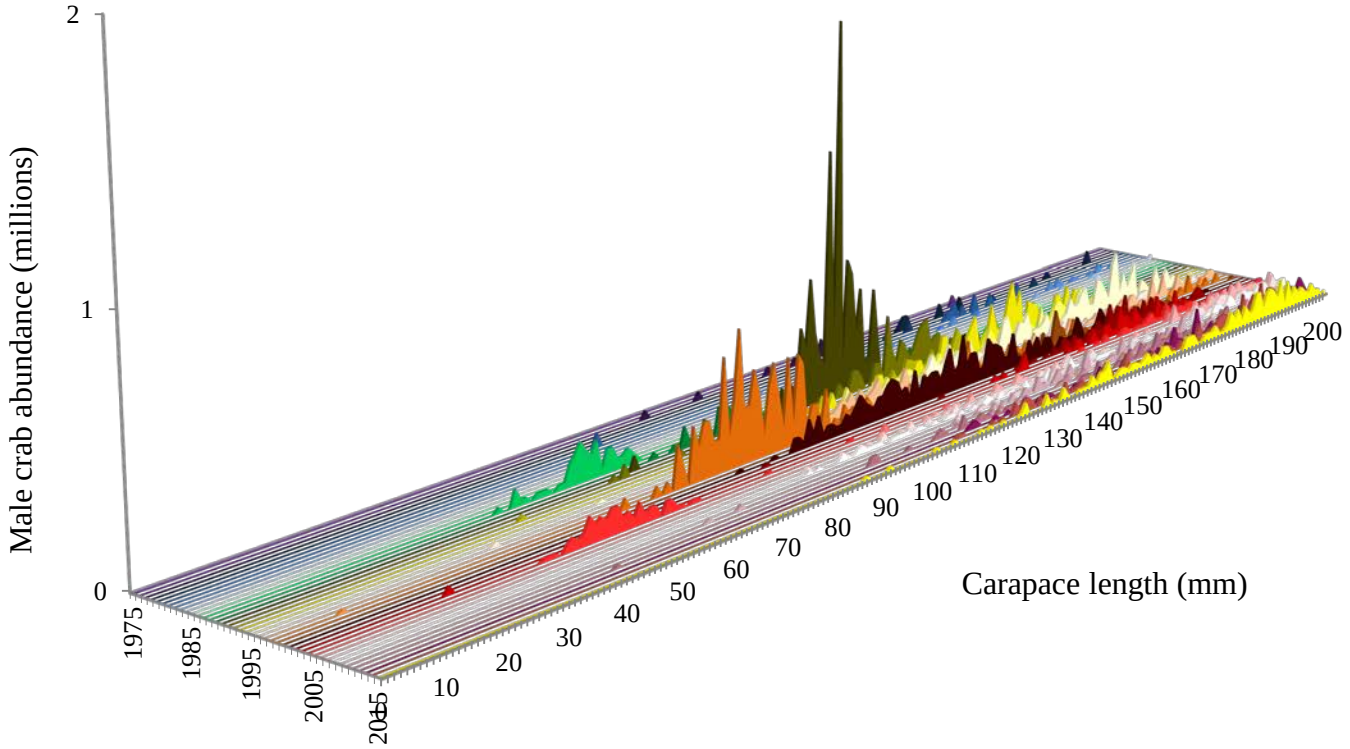

Figure 33. -- Size frequency by 1 mm length classes of Pribilof Islands male red king crab (*Paralithodes camtschaticus*) from 1975 to 2015.

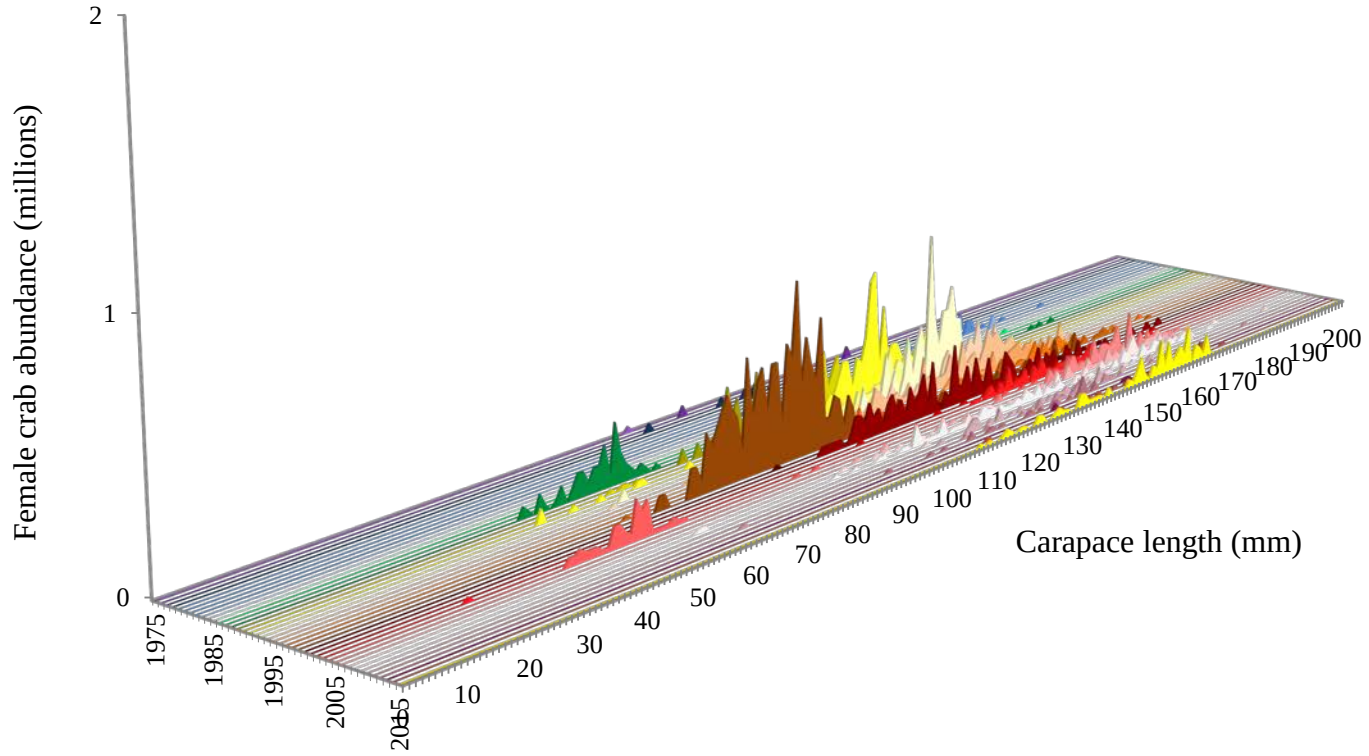

Figure 34. -- Size frequency by 1 mm length classes of Pribilof Islands female red king crab (*Paralithodes camtschaticus*) from 1975 to 2015.

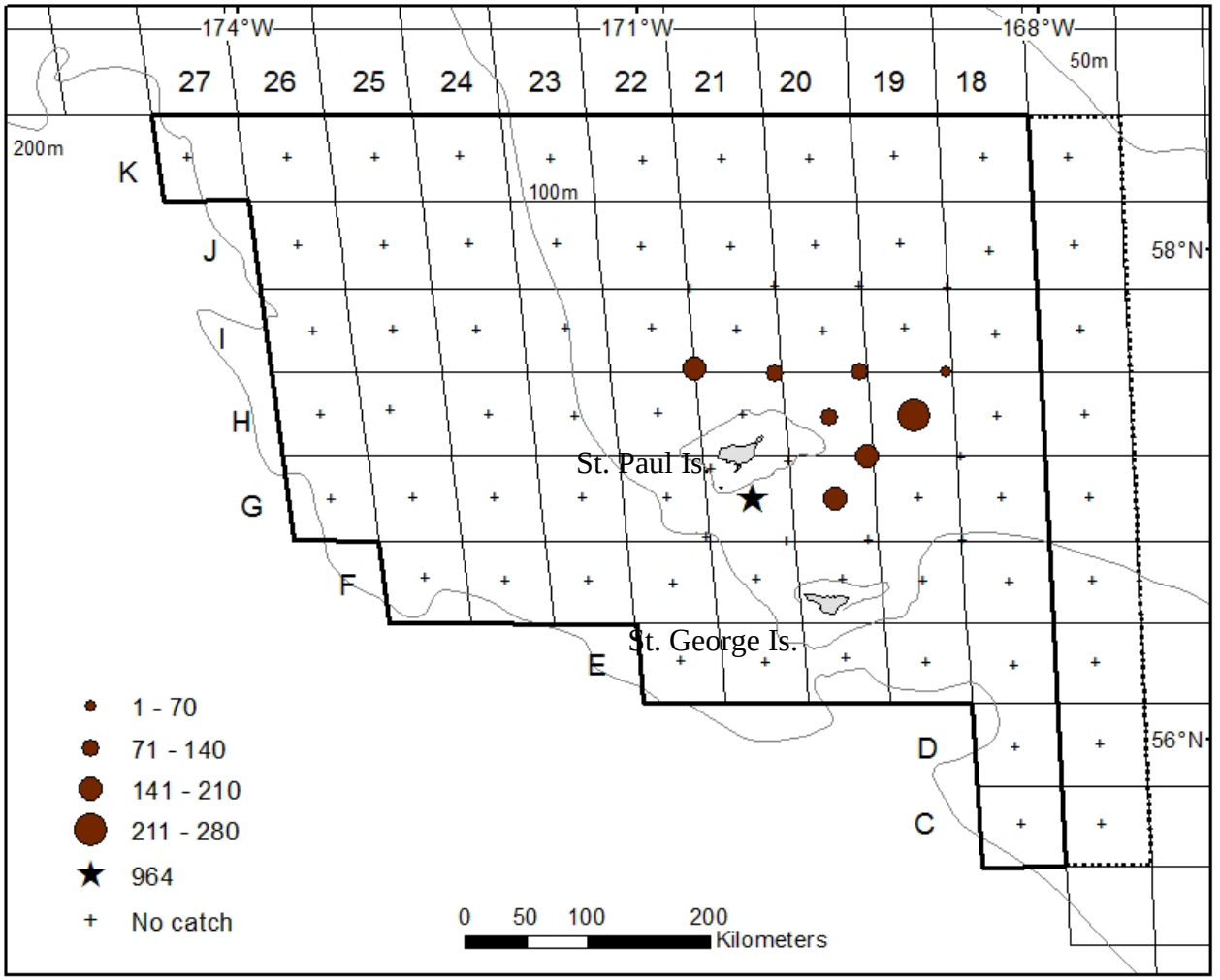

Figure 35. -- Total density (number nmi^{-2}) of blue king crab (*Paralithodes platypus*) at each station sampled in the Pribilof District in 2015. Data depicted by circles are equal interval densities, while stars represent densities larger than the standard scale. The outlined area depicts the management district as defined by ADF&G, while the dashed line depicts the modified eastern boundary as defined in the 2013 Rebuilding Plan (additional 9 stations).

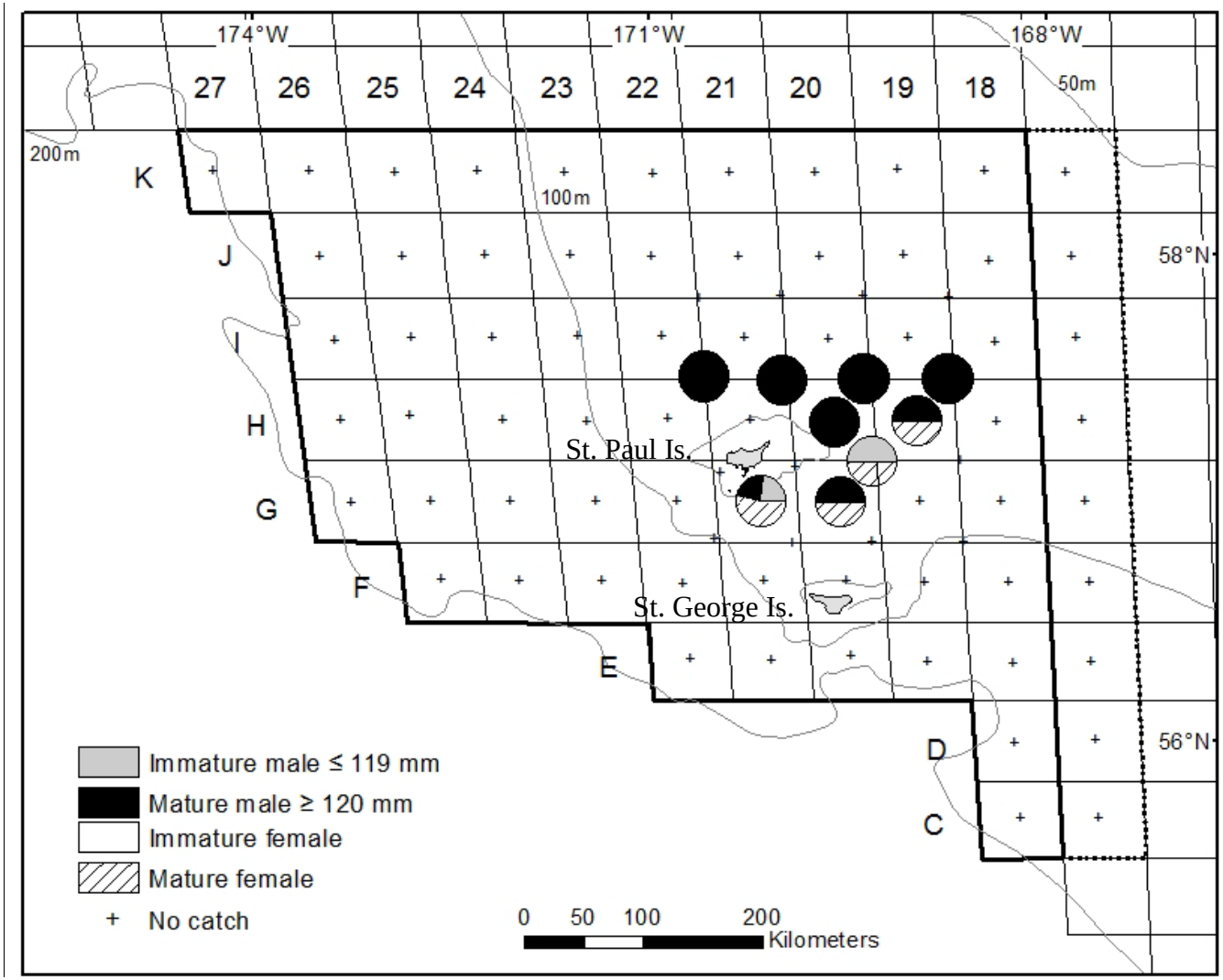

Figure 36. -- Percentage of male and female blue king crab (*Paralithodes platypus*) maturity categories at each station of the Pribilof District in 2015. The outlined area depicts the management district as defined by ADF&G, while the dashed line depicts the modified eastern boundary as defined in the 2013 Rebuilding Plan (additional 9 stations).

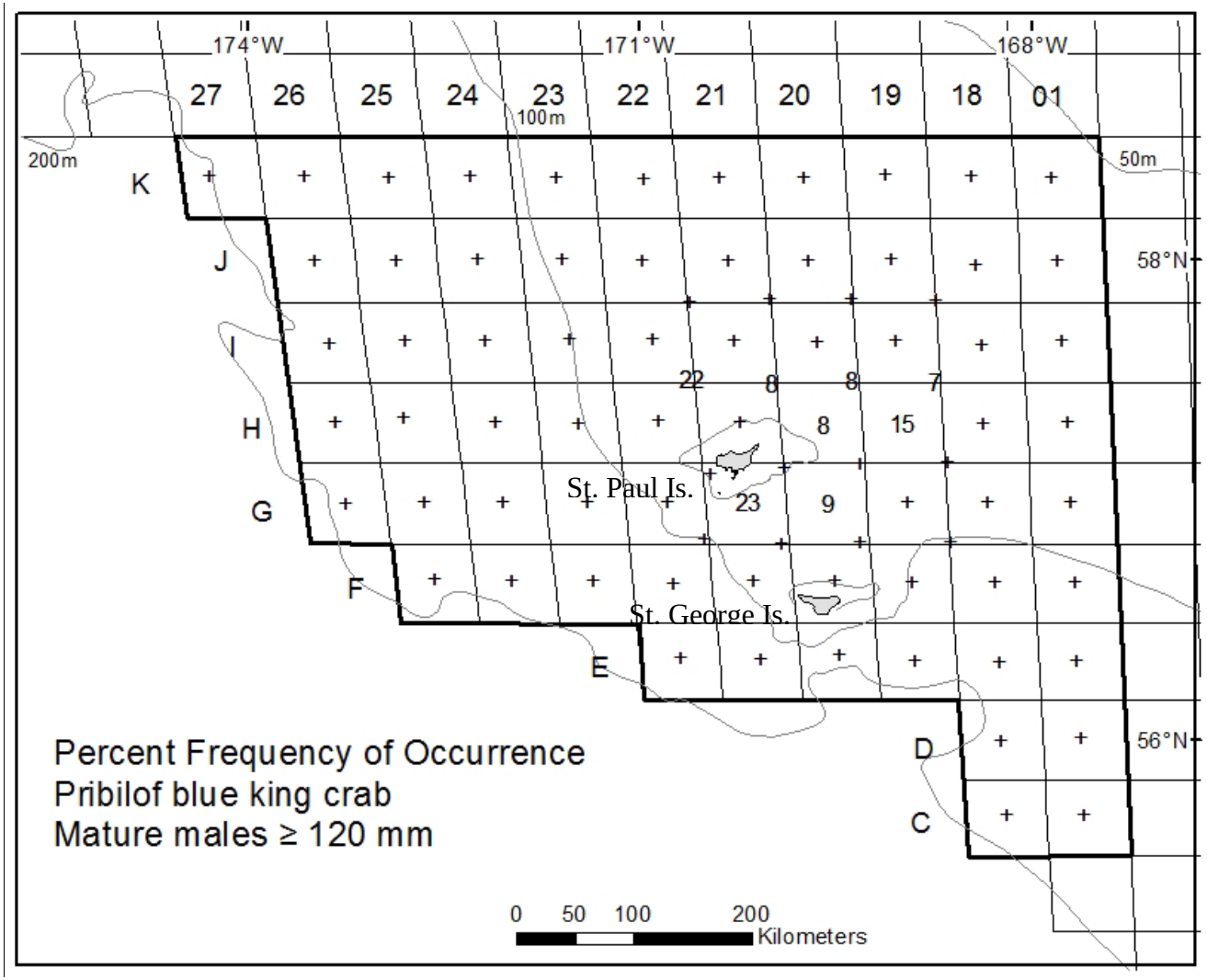

Figure 37. -- Percent frequency of occurrence of mature male blue king crab (*Paralithodes platypus)* at Pribilof District stations sampled in 2015. The outlined area depicts the management district as defined by ADF&G, while the dashed line depicts the modified eastern boundary as defined in the 2013 Rebuilding Plan (additional 9 stations).

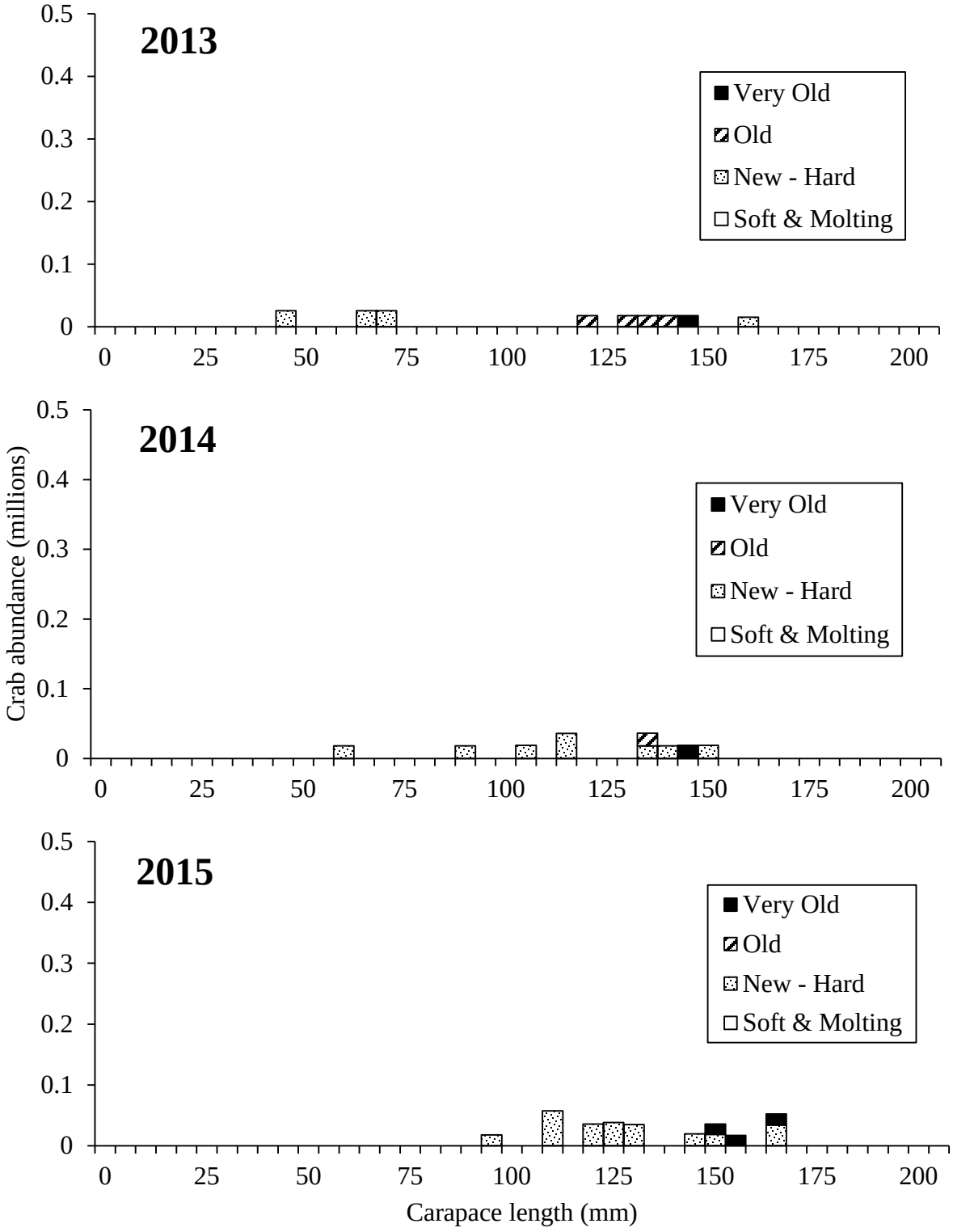

Figure 38. -- Size frequency by shell condition of Pribilof District male blue king crab (*Paralithodes platypus*) by 5 mm length classes, 2013-2015.

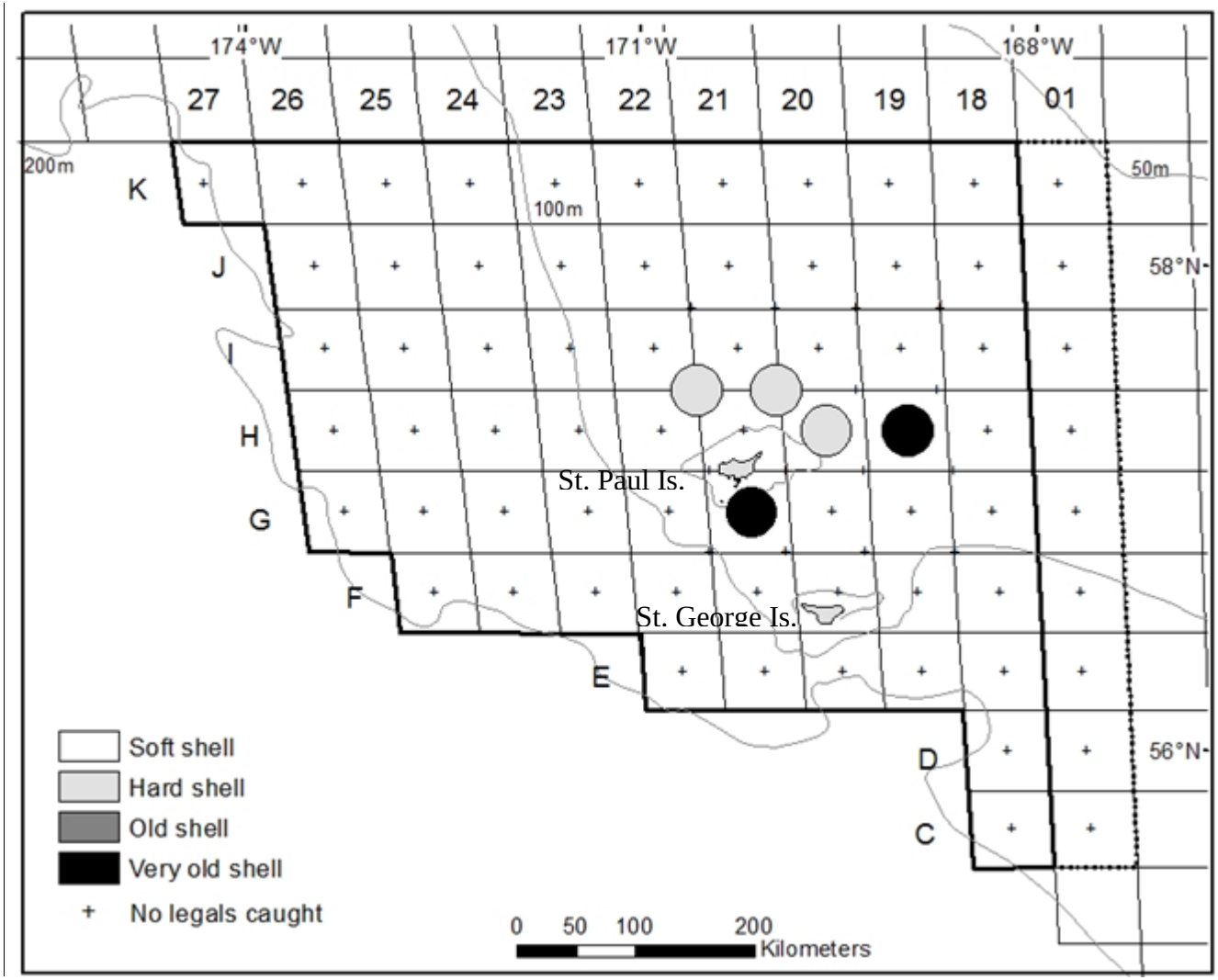

Figure 39. -- Distribution of legal-sized male blue king crab (*Paralithodes platypus*) caught at each station of the Pribilof District in 2015 distinguished by shell condition. The outlined area depicts the management district as defined by ADF&G, while the dashed line depicts the modified eastern boundary as defined in the 2013 Rebuilding Plan (additional 9 stations).

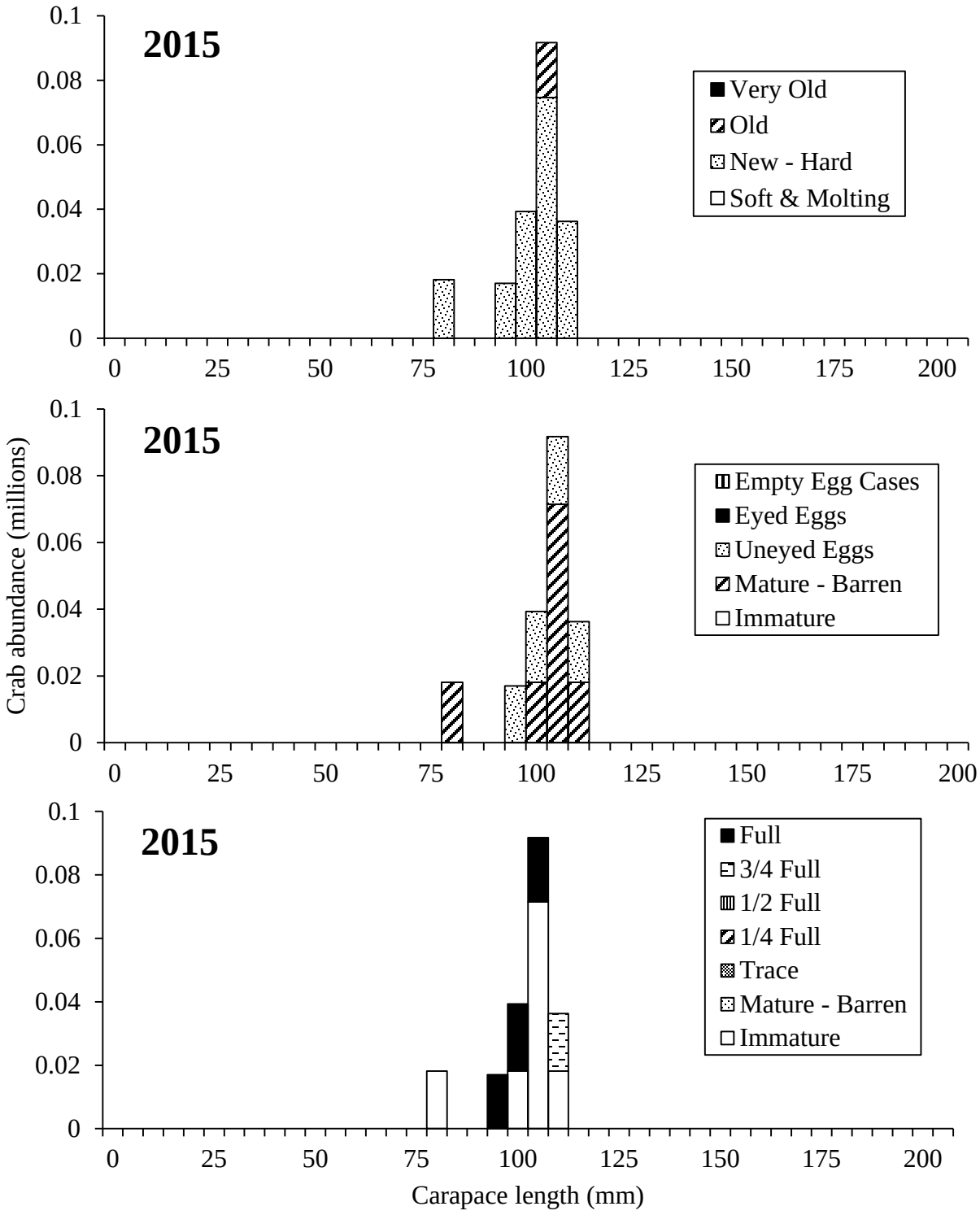

Figure 40. -- Size frequency by shell condition, egg condition, and clutch fullness of Pribilof District female blue king crab (*Paralithodes platypus*) by 5 mm length classes in 2015.

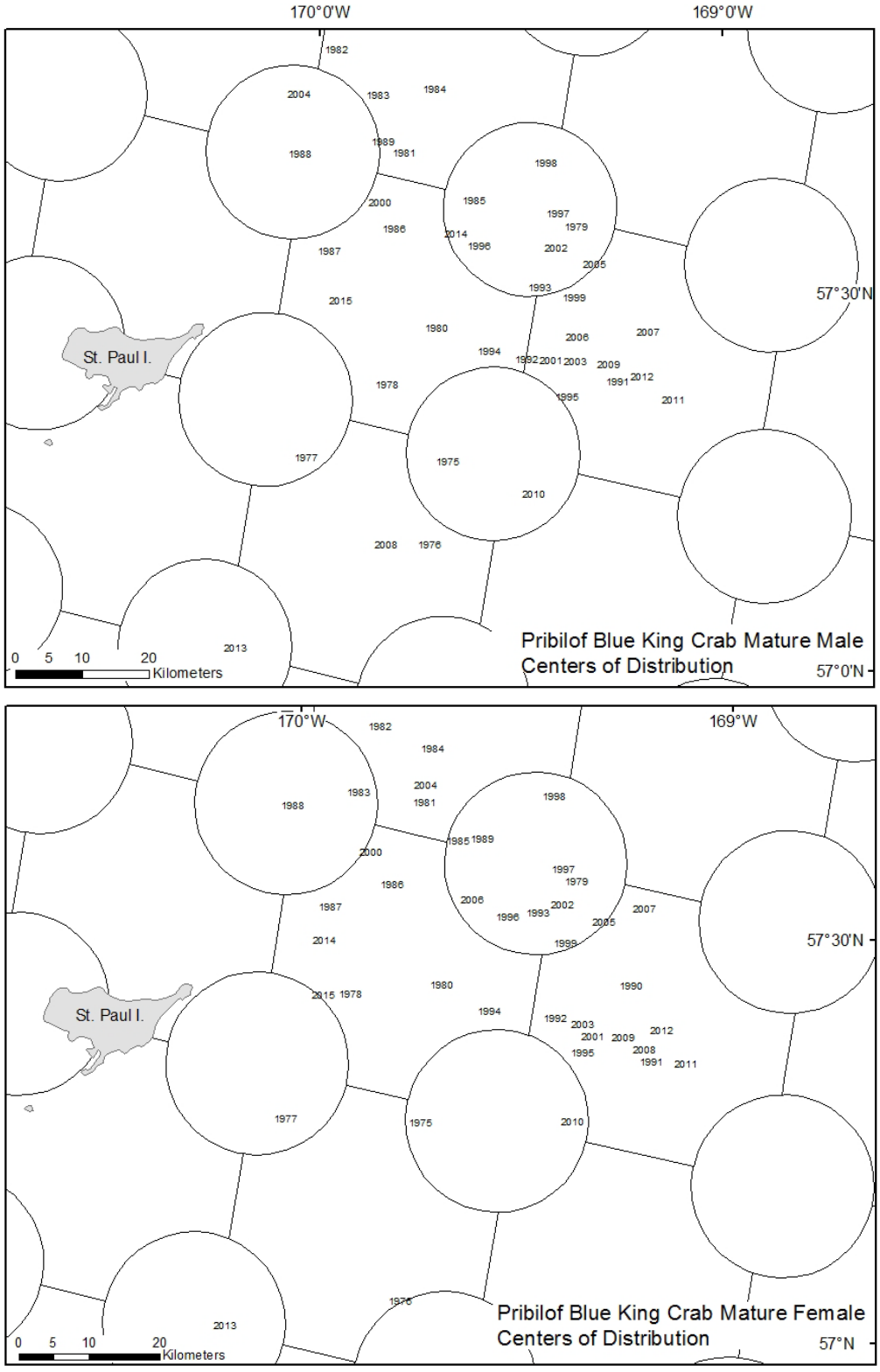

Figure 41. -- Centers of stock distribution of Pribilof Islands male and female blue king crab (*Paralithodes platypus*) from 1975 to 2015.

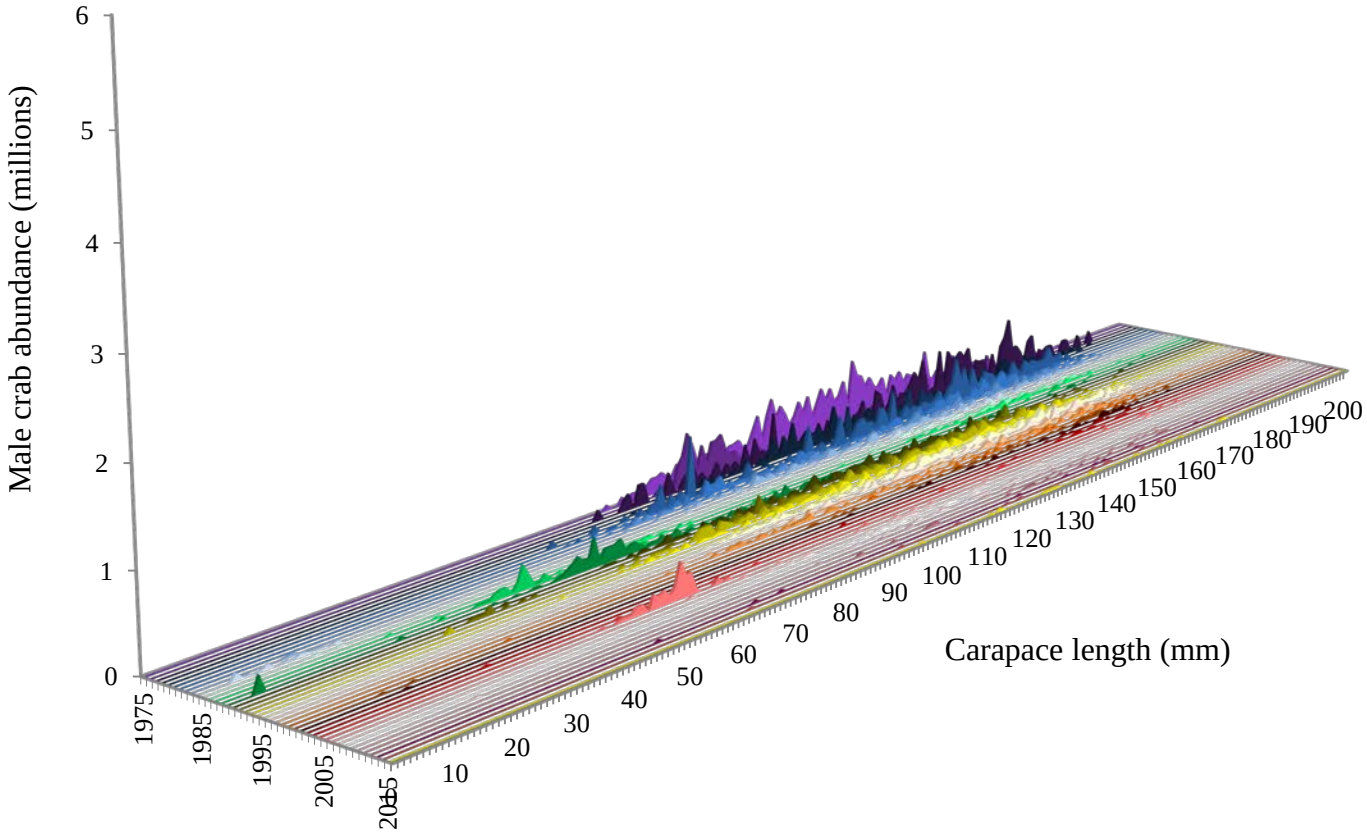

Figure 42. -- Size frequency by 1 mm length classes of Pribilof Islands male blue king crab (*Paralithodes platypus*) from 1975 to 2015.

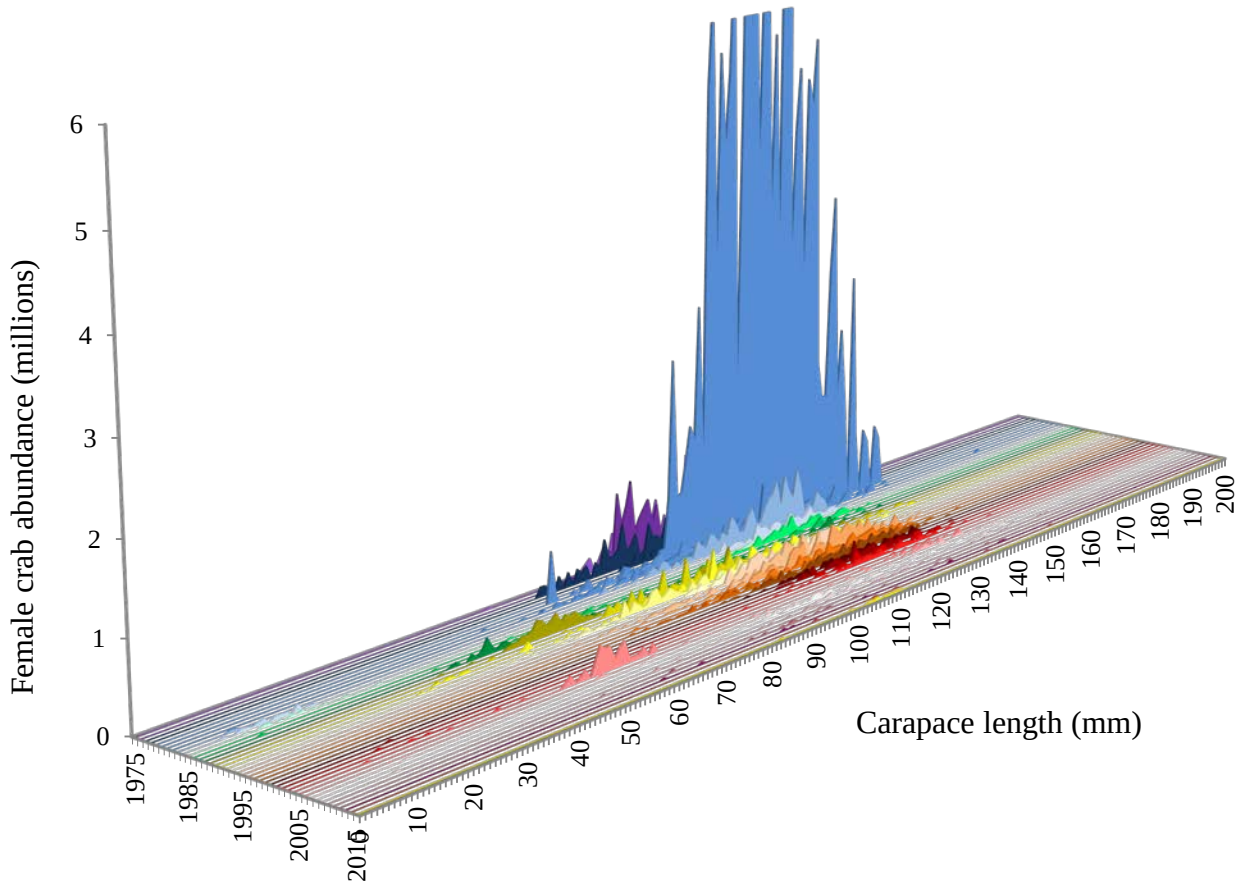

Figure 43. -- Size frequency by 1 mm length classes of Pribilof Islands female blue king crab (*Paralithodes platypus*) from 1975 to 2015.

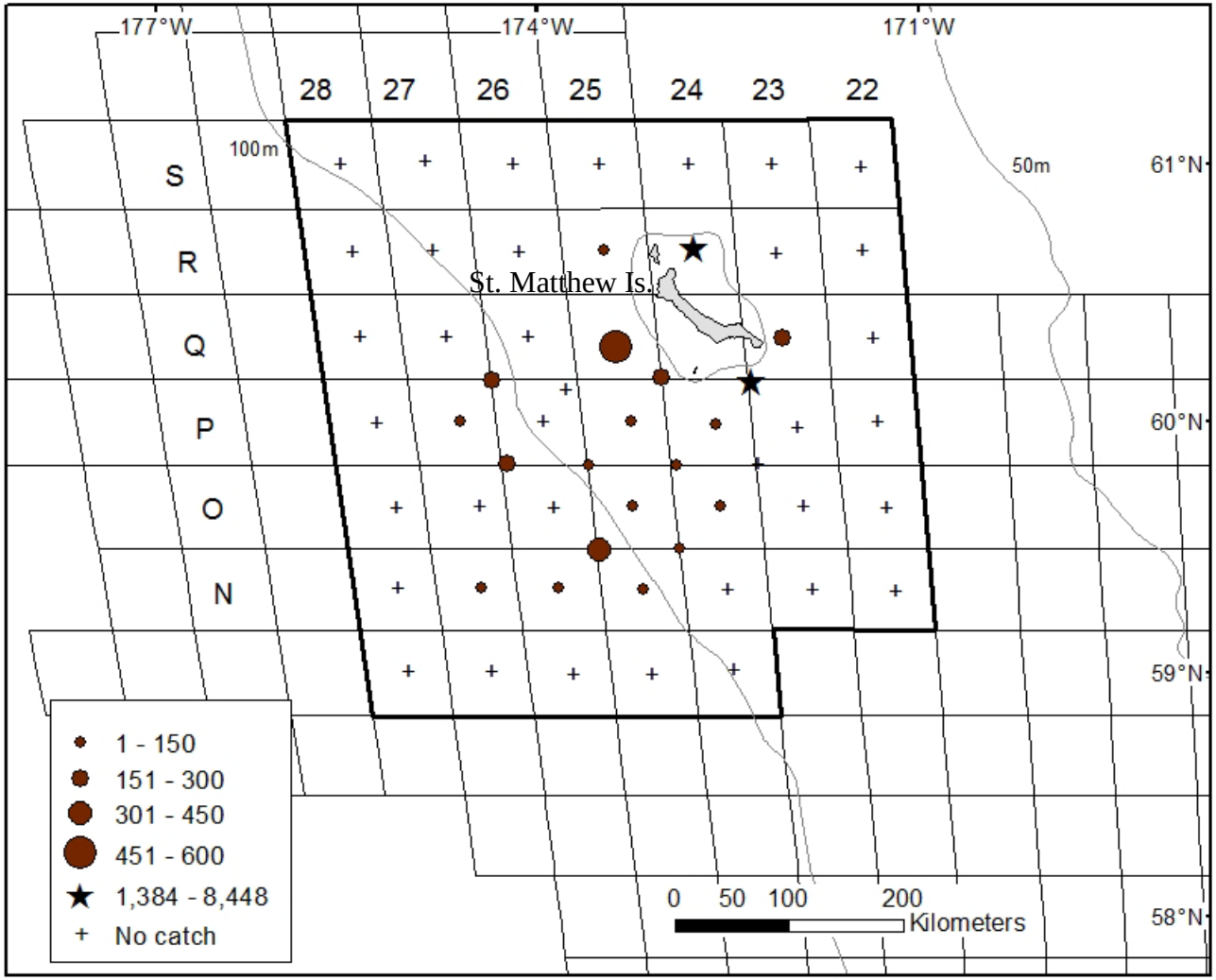

Figure 44. -- Total density (number nmi^{-2}) of blue king crab (*Paralithodes platypus*) at each station sampled in the St. Matthew Island Section of the Northern District in 2015. Data depicted by circles are equal interval densities, while stars are densities larger than the standard scale. The outlined area depicts stations within the St. Matthew Island Section sampling strata.

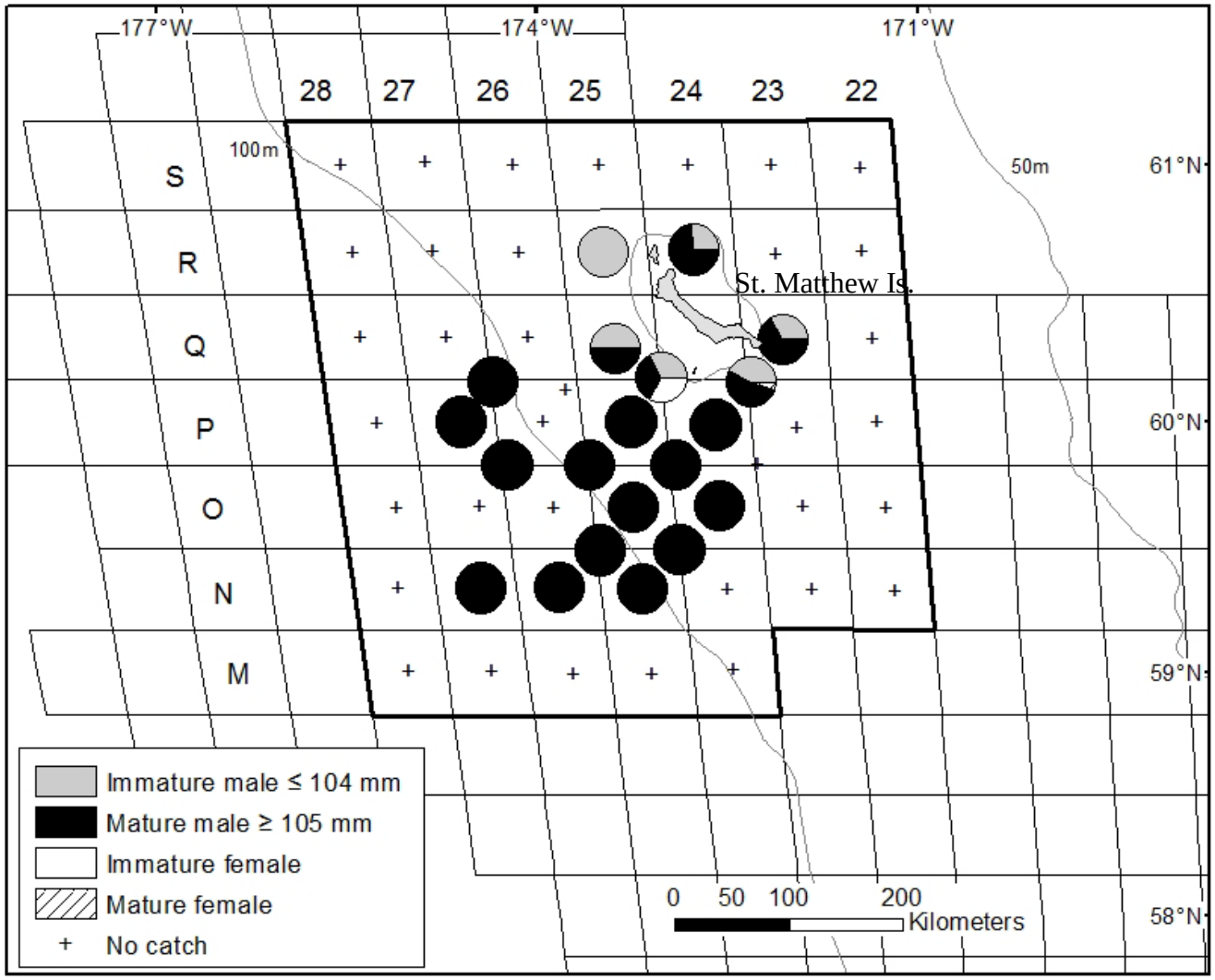

Figure 45. -- Percentage of male and female blue king crab (*Paralithodes platypus*) maturity categories at each station of the St. Matthew Island Section of the Northern District in 2015. The outlined area depicts stations within the St. Matthew Island Section sampling strata.

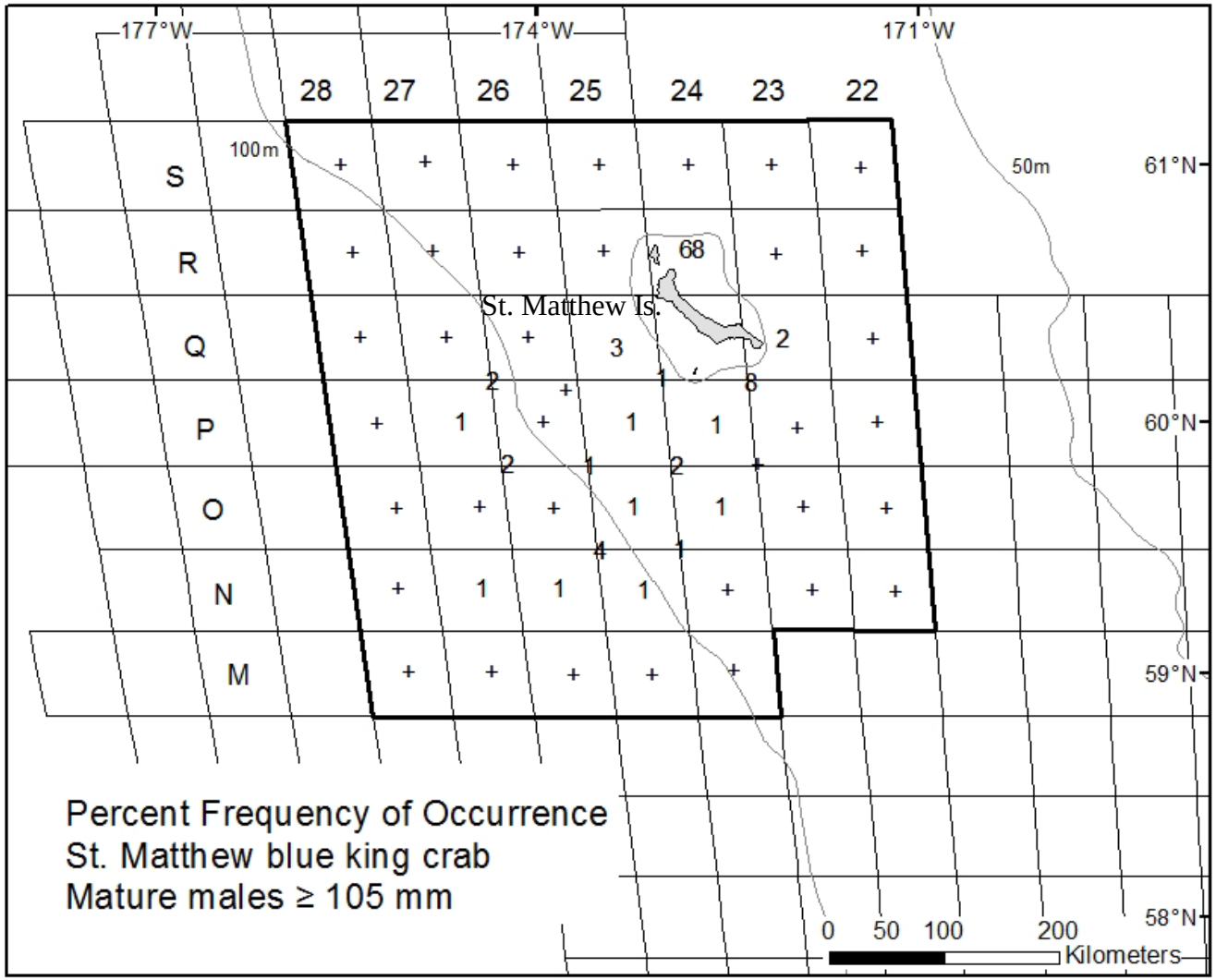

Figure 46. -- Percent frequency of occurrence of mature male blue king crab (*Paralithodes platypus)* at stations in the 2015 St. Matthew Island Section sampling strata of the Northern District.

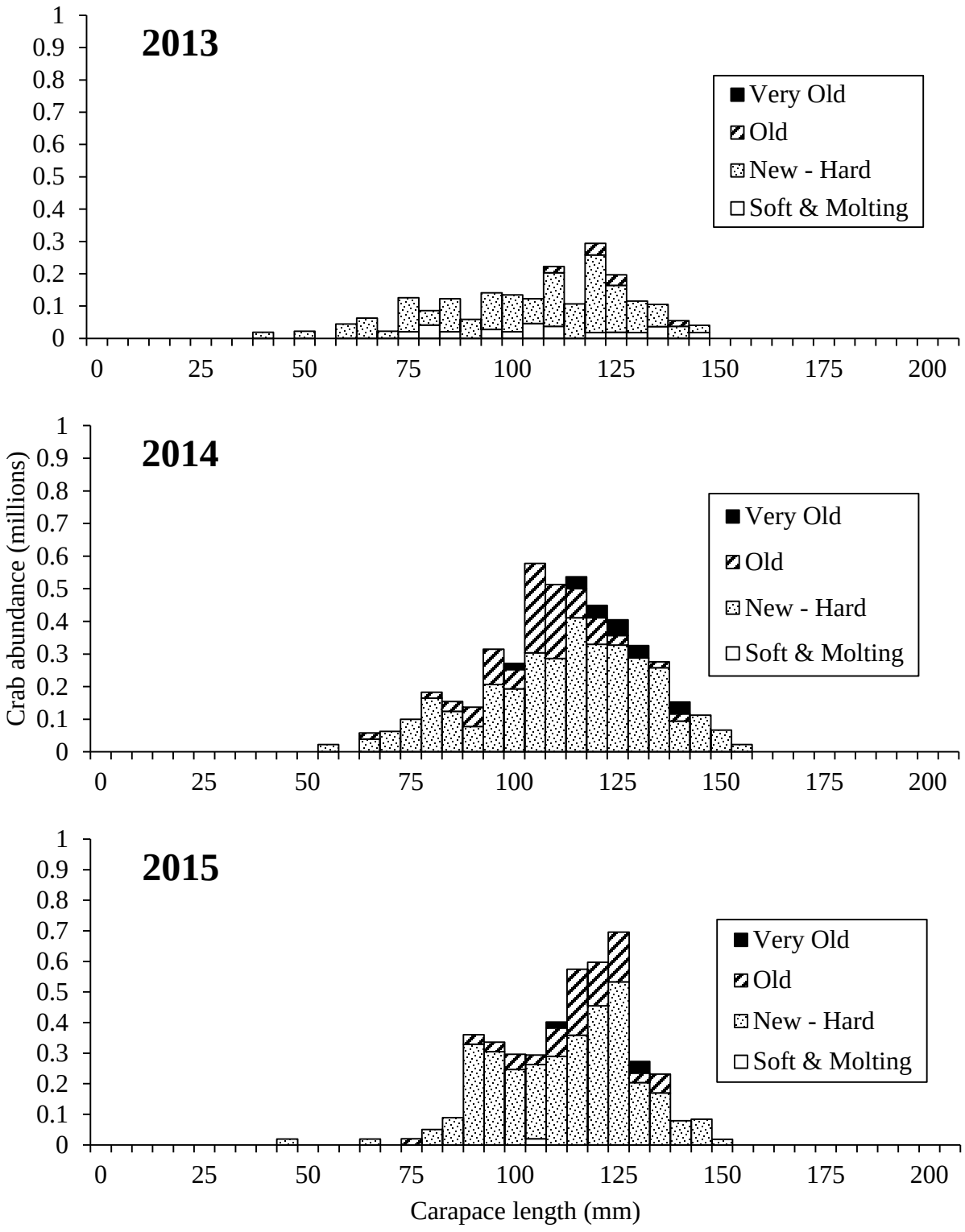

Figure 47. -- Size frequency by shell condition of St. Matthew Island Section male blue king crab (*Paralithodes platypus*) by 5 mm length classes, 2013-2015.

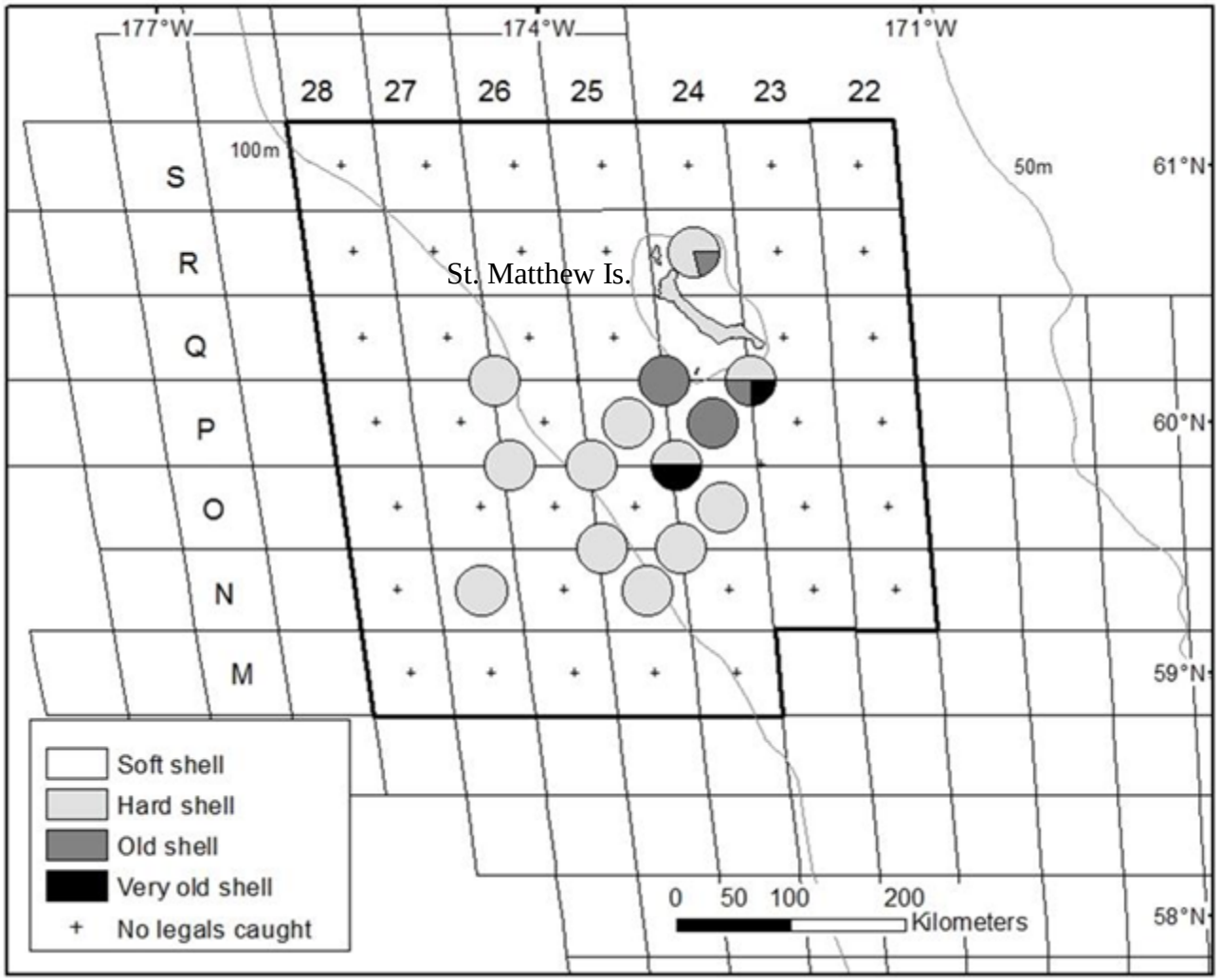

Figure 48. -- Distribution of legal-sized male blue king crab (*Paralithodes platypus*) caught at each station of the St. Matthew Island Section of the Northern District in 2015 and distinguished by shell condition. The outlined area depicts stations within the St. Matthew Island Section sampling strata.

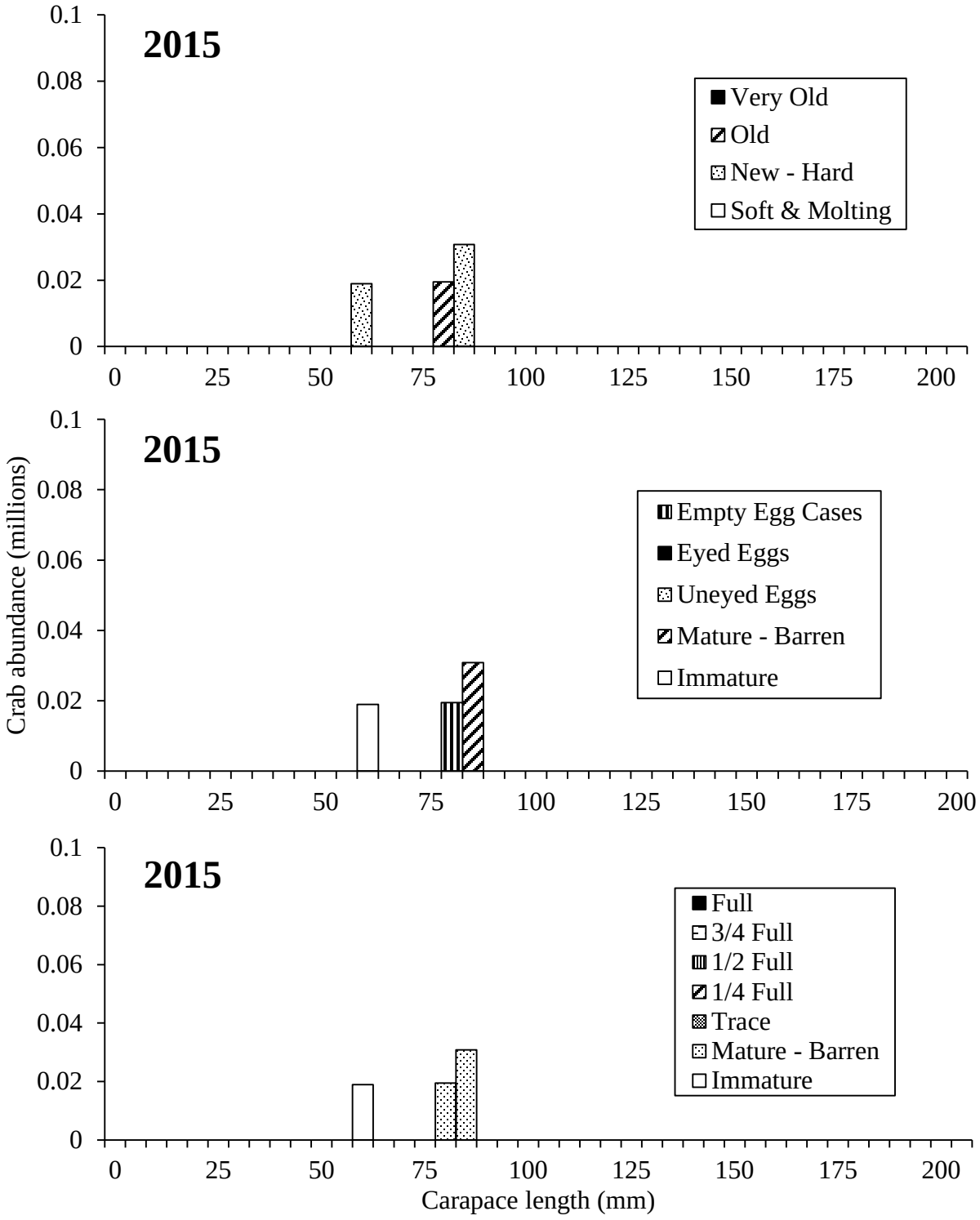

Figure 49. -- Size frequency by shell condition, egg condition, and clutch size of St. Matthew Island Section female blue king crab (*Paralithodes platypus*) by 5 mm length classes in 2015.

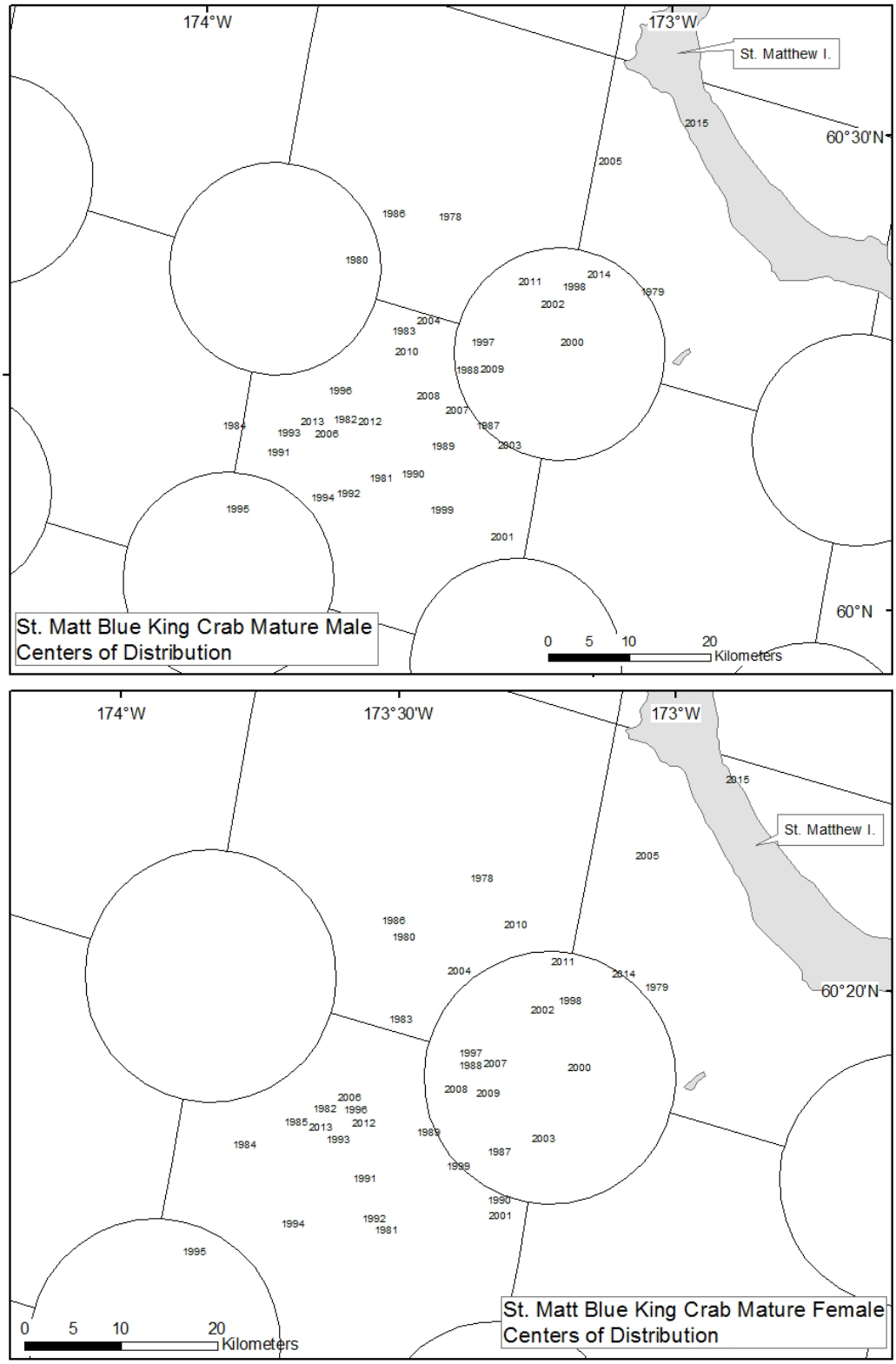

Figure 50. -- Centers of stock distribution of St. Matthew Island male and female blue king crab (*Paralithodes platypus*) from 1975 to 2015.

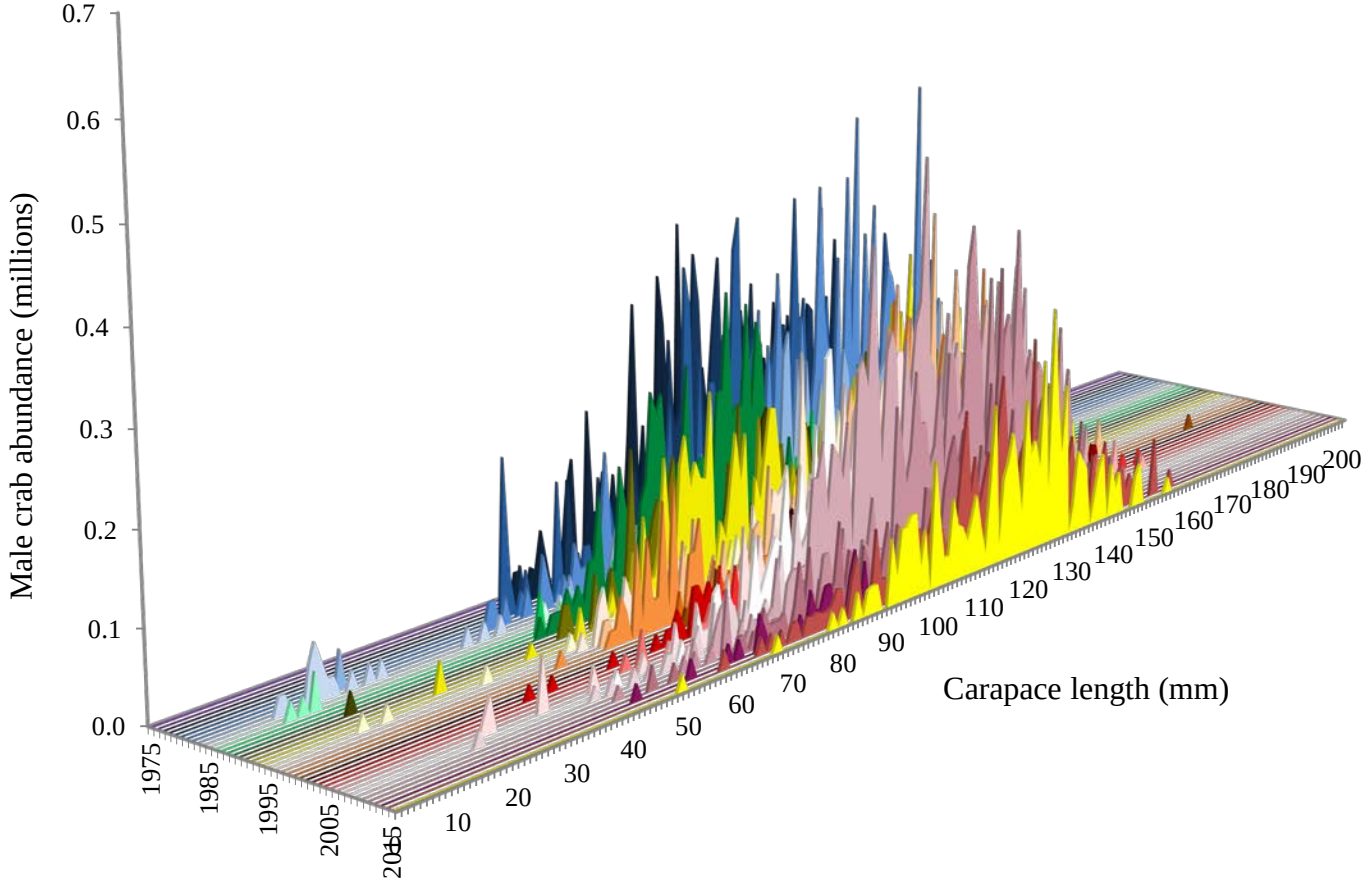

Figure 51. -- Size frequency by 1 mm length classes of St. Matthew Island Section male blue king crab (*Paralithodes platypus*) from 1978 to 2015.

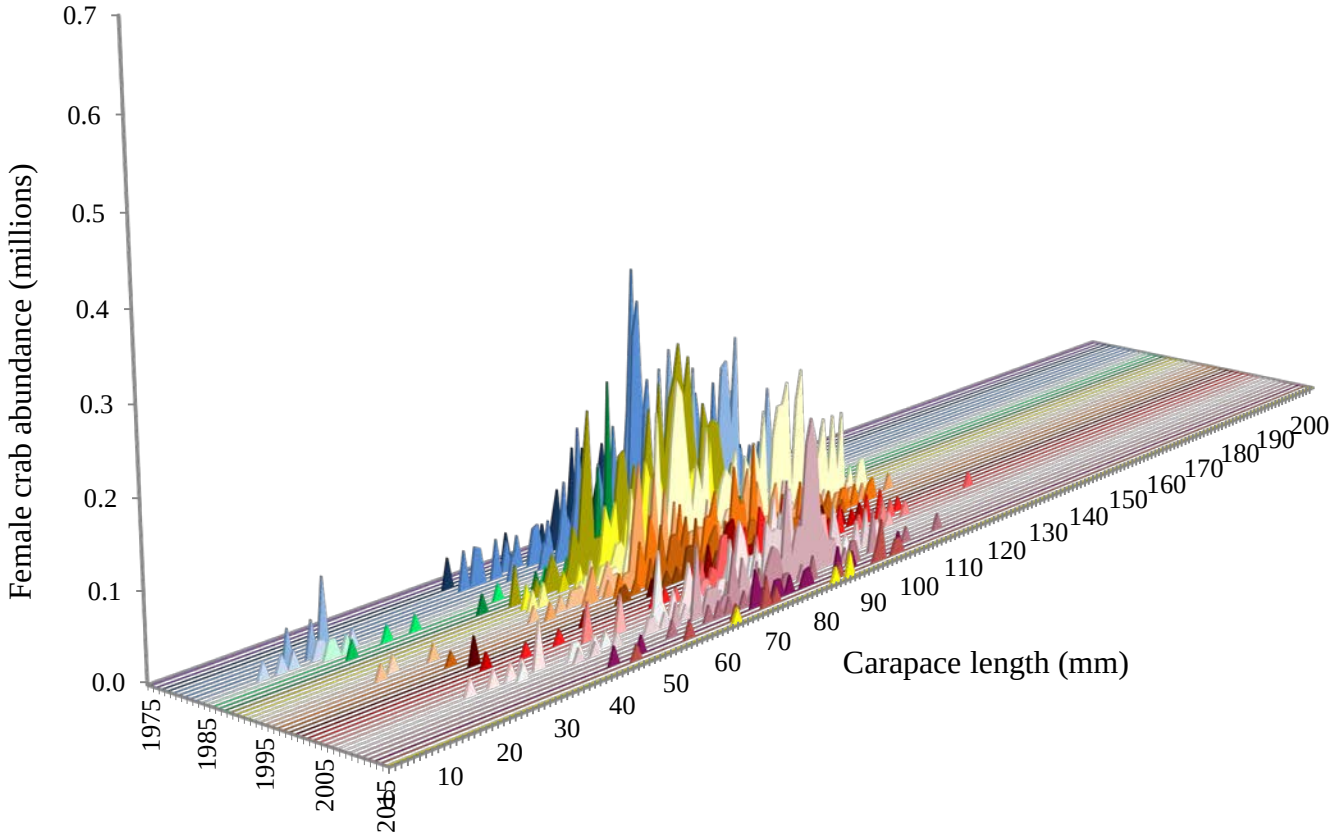

Figure 52. -- Size frequency by 1 mm length classes of St. Matthew Island Section female blue king crab (*Paralithodes platypus*) from 1978 to 2015.

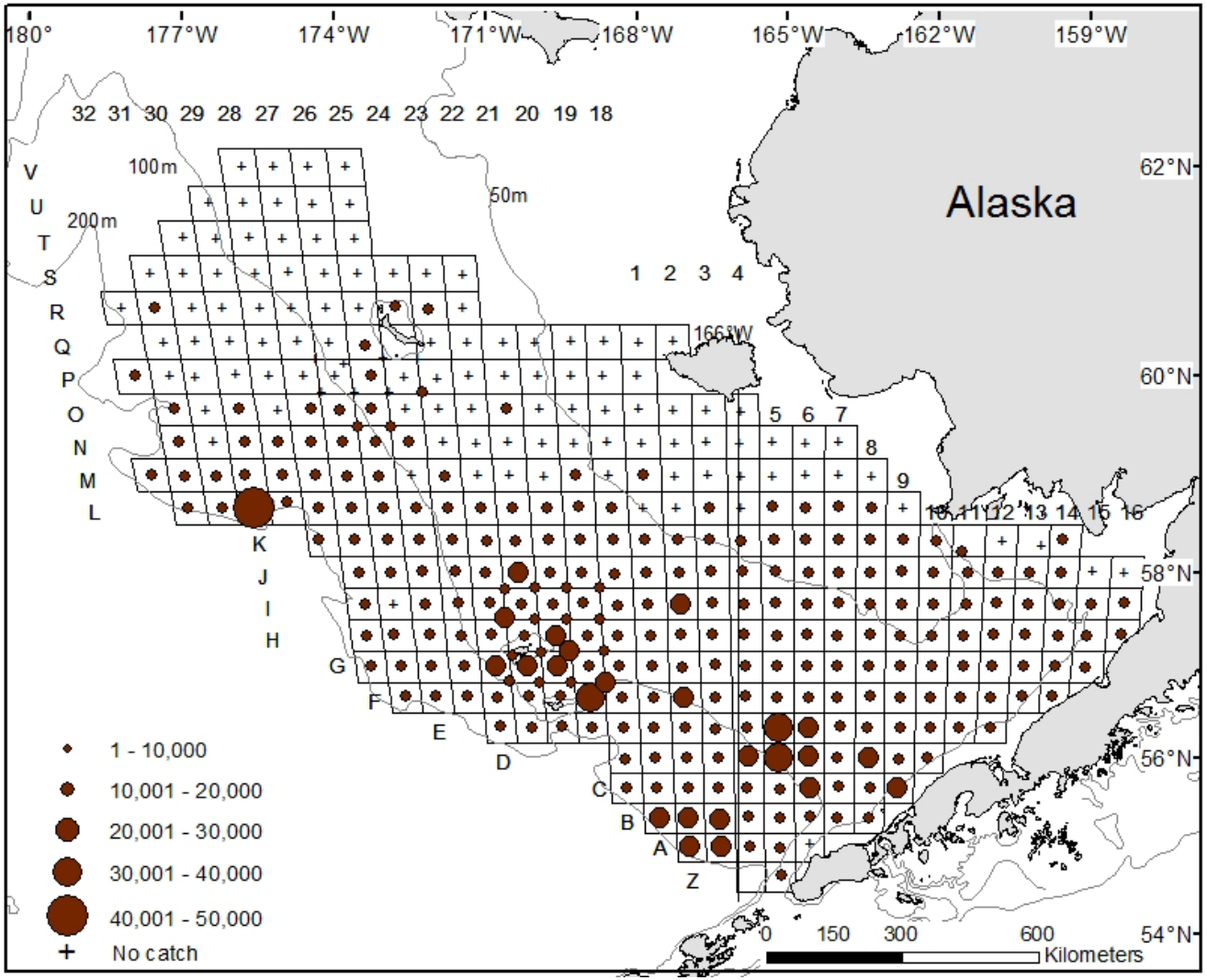

Figure 53. -- Total density (number nmi^{-2}) of Tanner crab (*Chionoecetes bairdi)* at each station sampled in 2015.

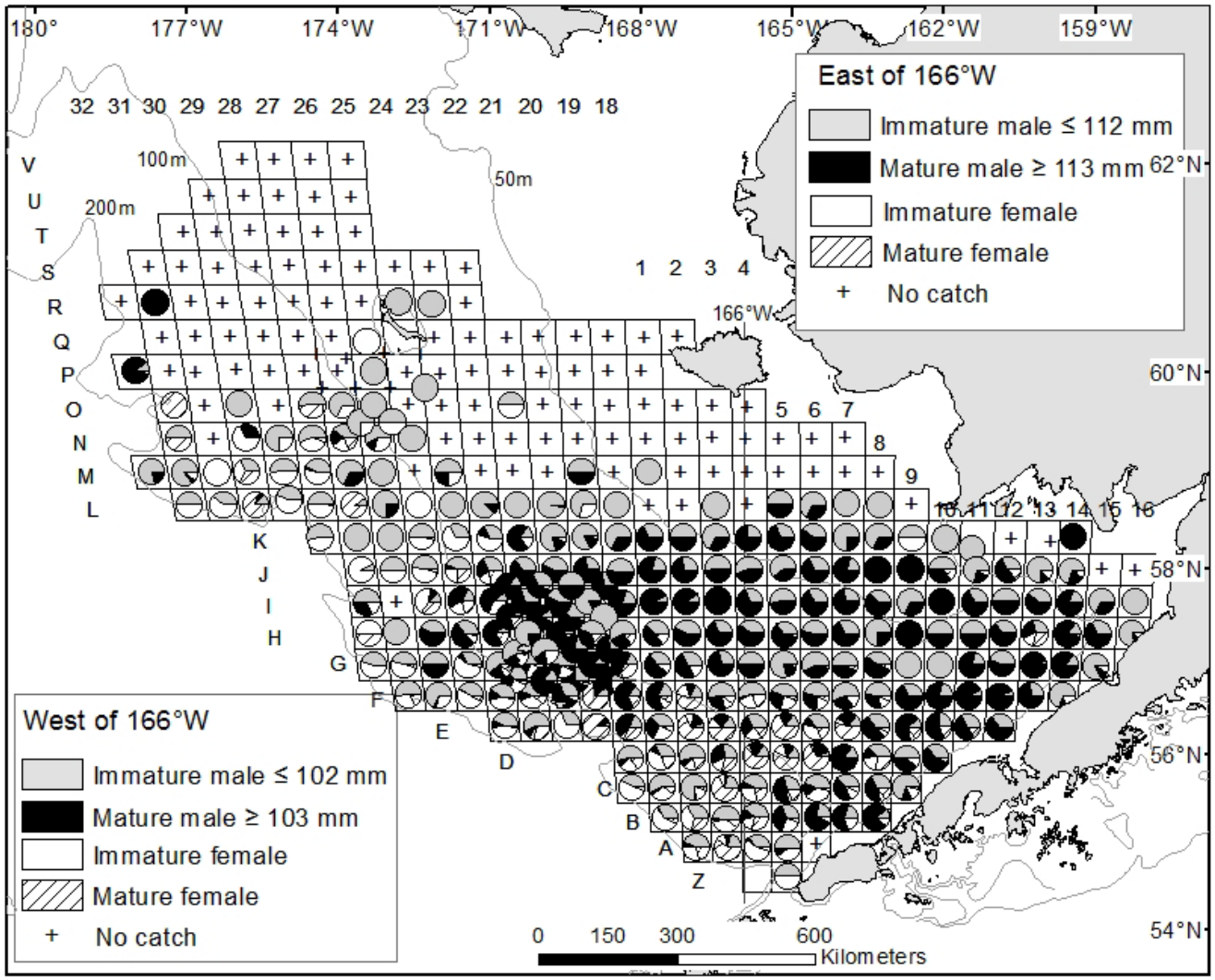

Figure 54. -- Percentage of male and female Tanner crab (*Chionoecetes bairdi*) maturity categories at each station sampled in 2015.

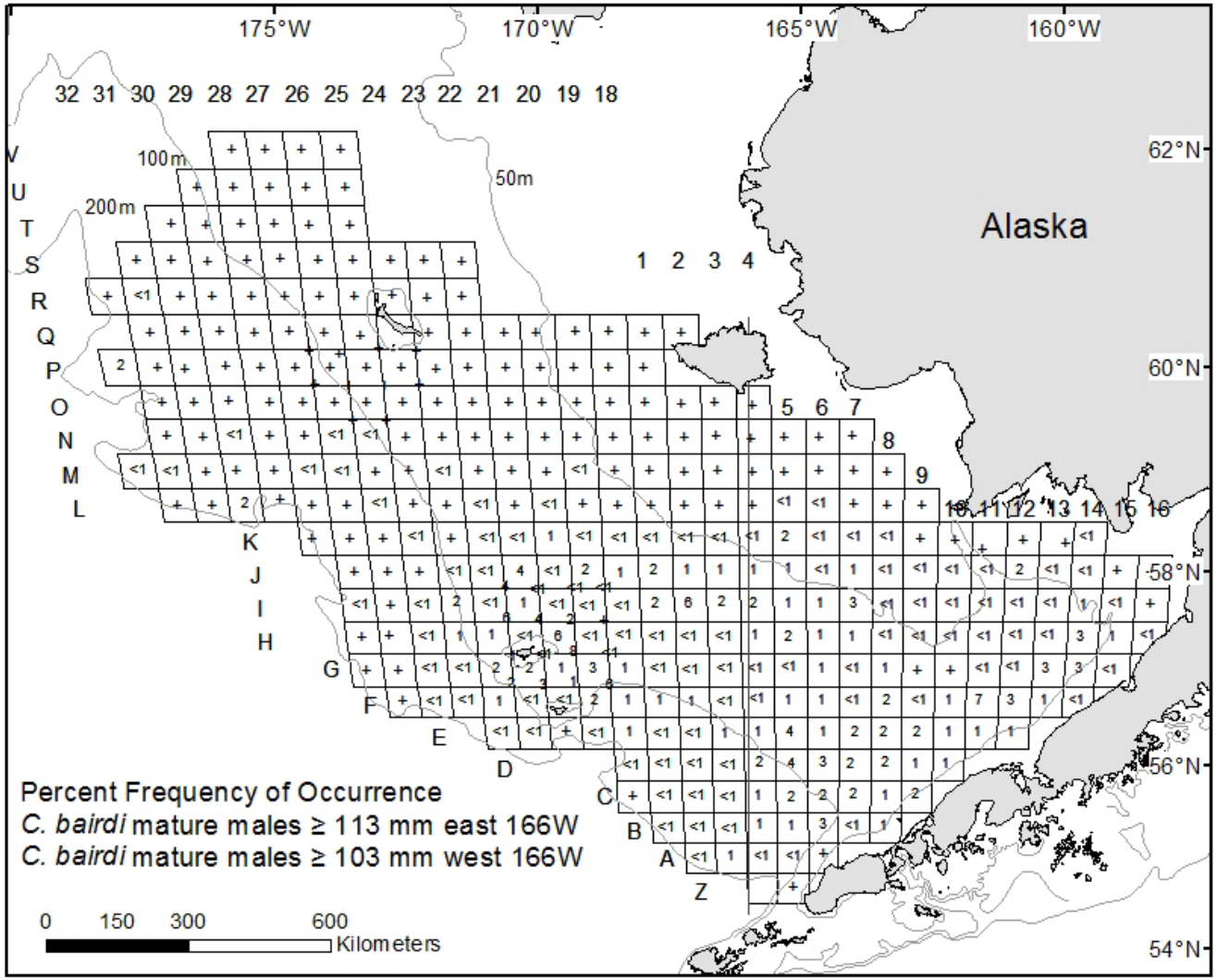

Figure 55. -- Percent frequency of occurrence of mature male Tanner crab (*Chionoecetes bairdi)* at stations sampled in the 2015.

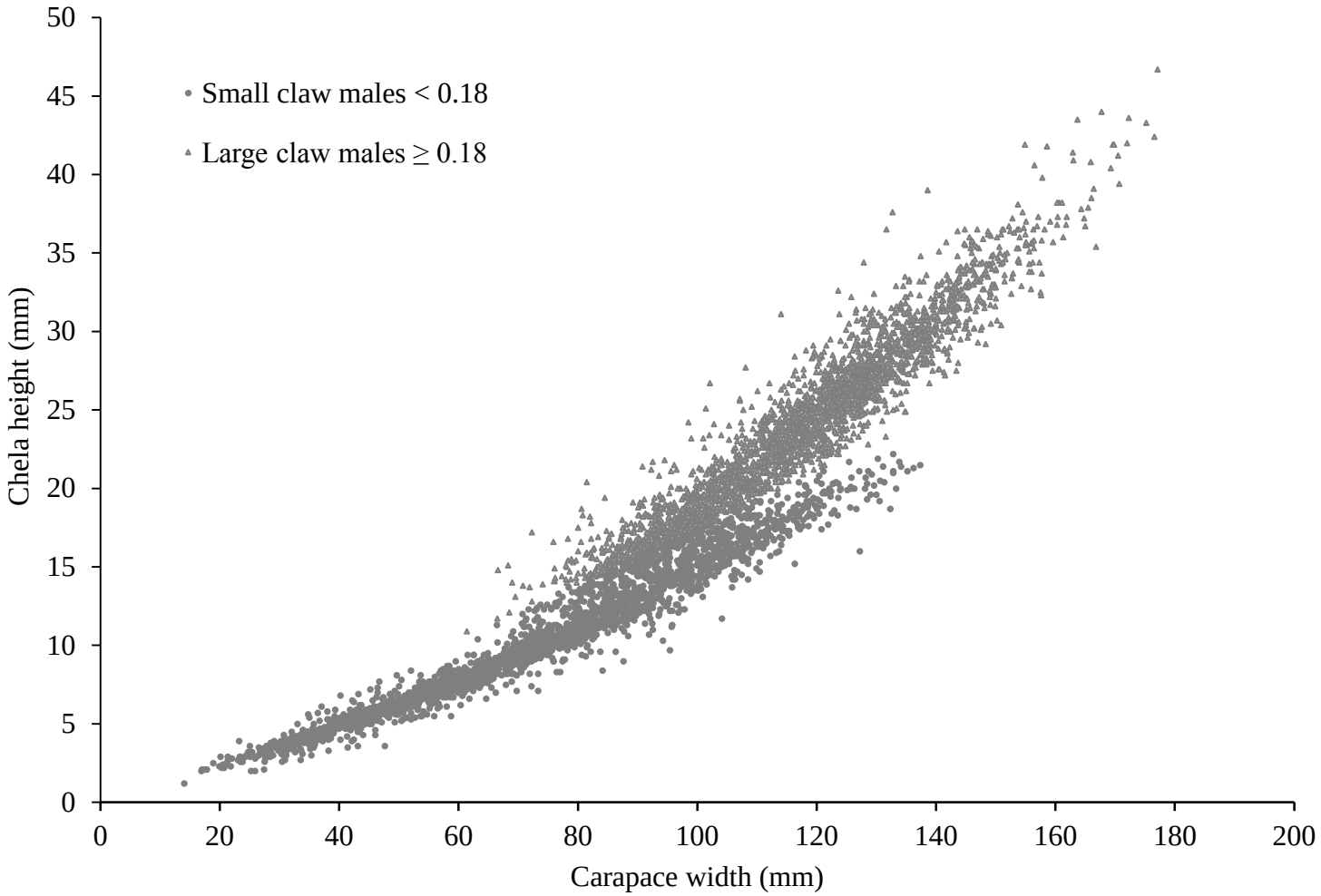

Figure 56. -- Male Tanner crab (*Chionoecetes bairdi*) chela height versus carapace width measurements collected on the 2008, 2010, 2012, and 2014 (all years combined, n = 5,432) National Marine Fisheries Service eastern Bering Sea bottom trawl surveys.

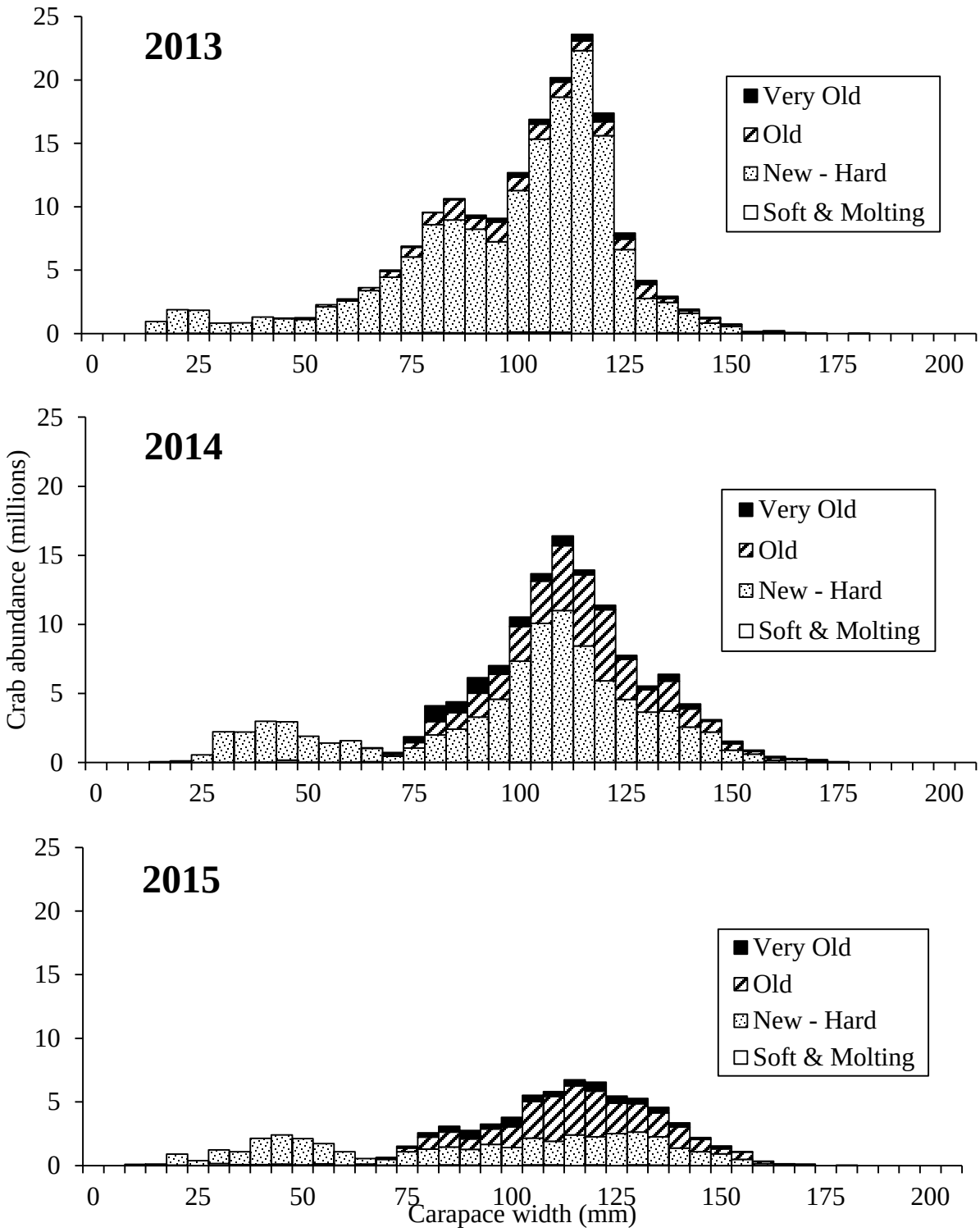

Figure 57. -- Size frequency by shell condition of male Tanner crab (*Chionoecetes bairdi*) east of 166° by 5 mm width classes of all districts combined, 2013-2015.

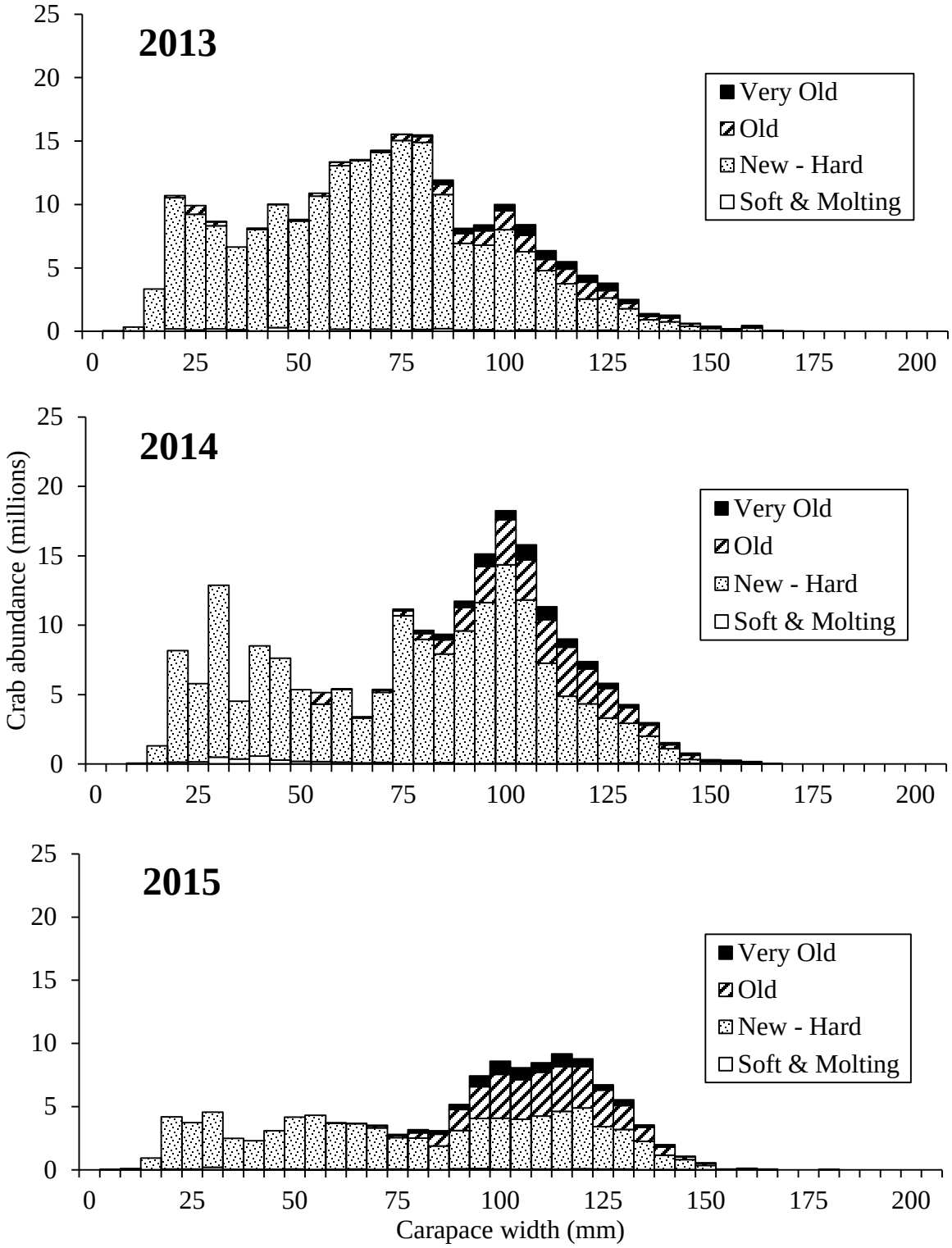

Figure 58. -- Size frequency by shell condition of male Tanner crab (*Chionoecetes bairdi*) west of 166° by 5 mm width classes of all districts combined, 2013-2015.

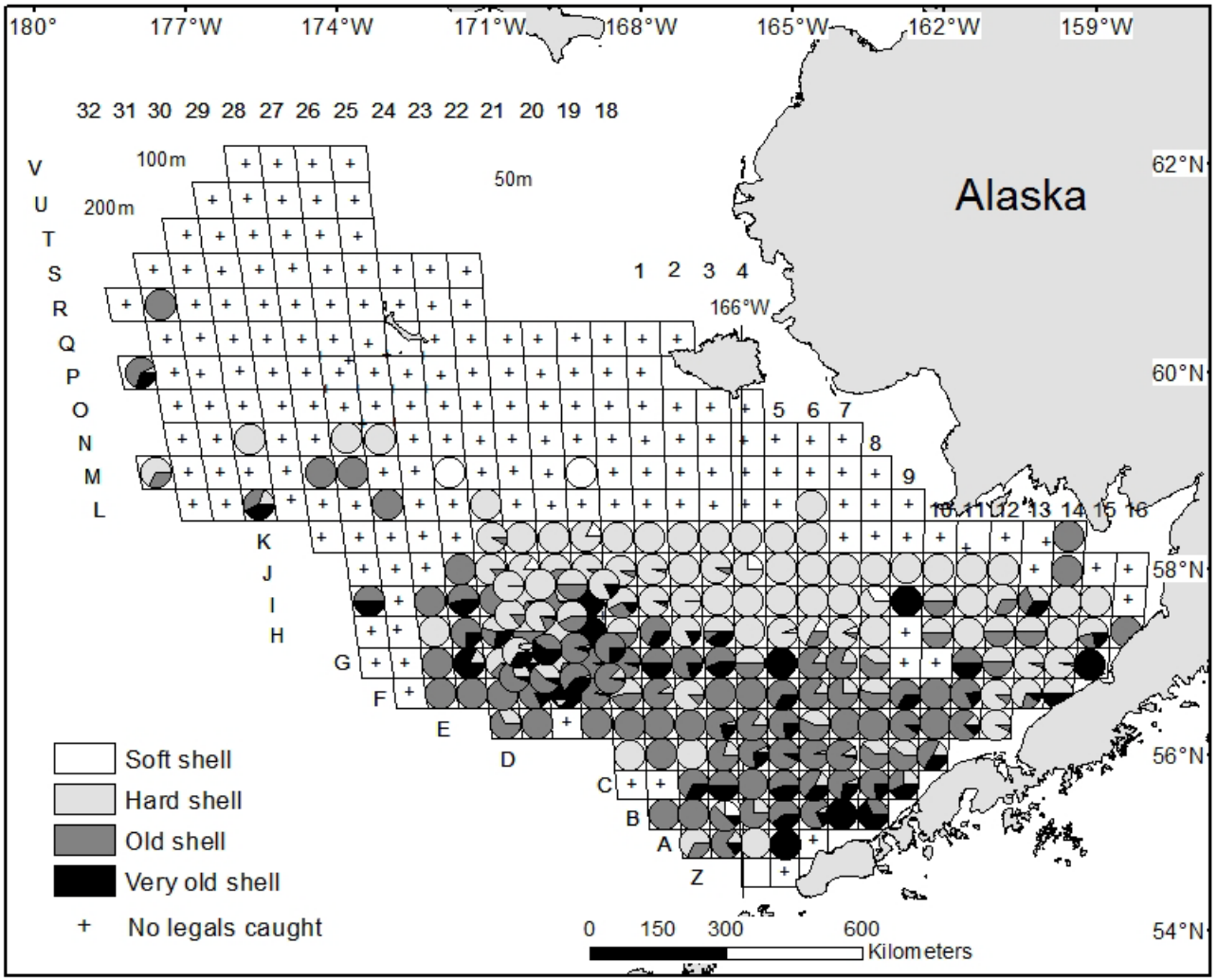

Figure 59. -- Distribution of legal-sized male Tanner crab (*Chionoecetes bairdi*) caught at each station in 2015 and distinguished by shell condition. Tanner male crab ≥ 120 mm and ≥ 110 mm CW are the legal-size categories for east and west of 166° W, respectively.

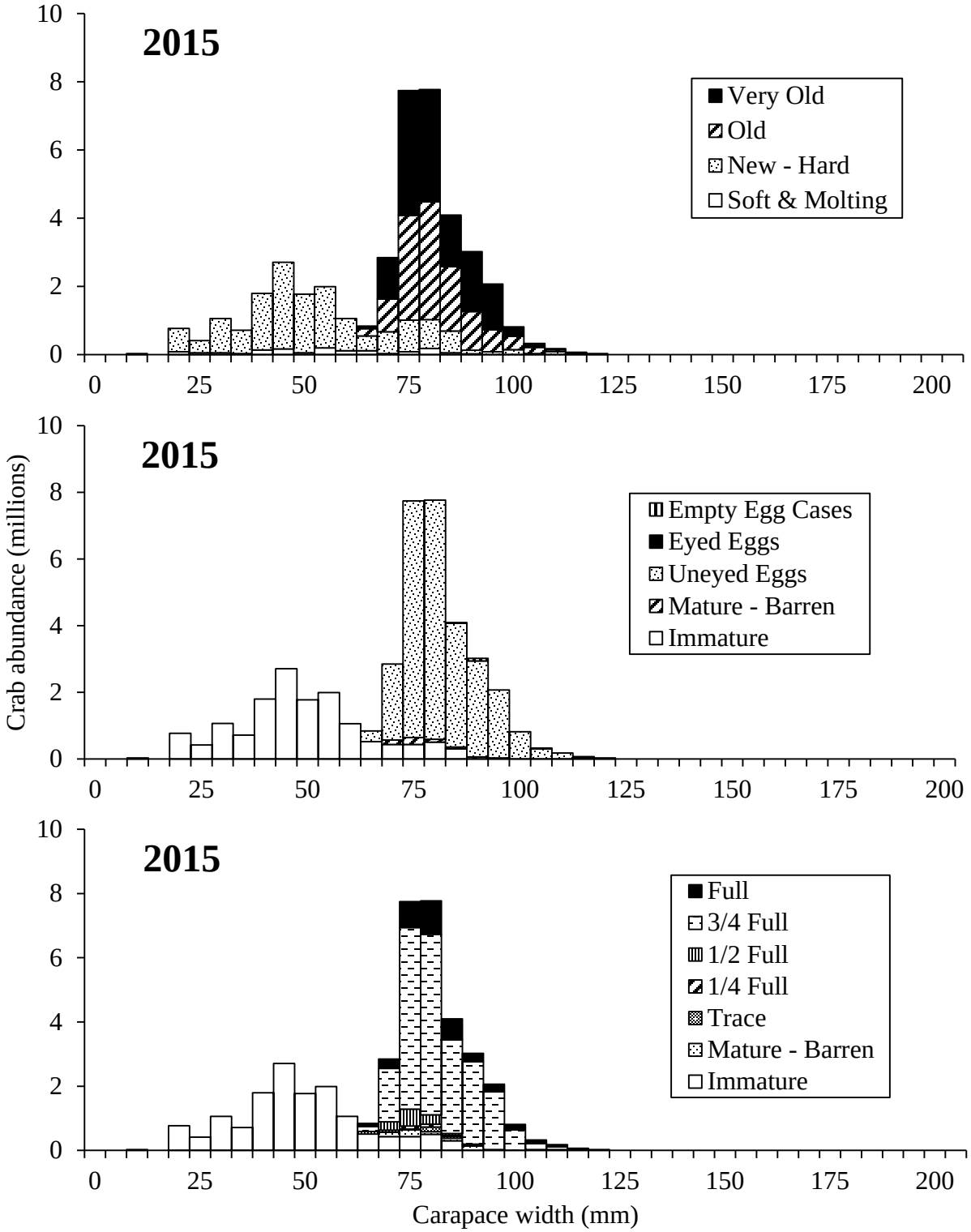

Figure 60. -- Size frequency by shell condition, egg condition, and clutch fullness of female Tanner crab (*Chionoecetes bairdi*) east of 166° by 5 mm width classes of all districts combined in 2015.

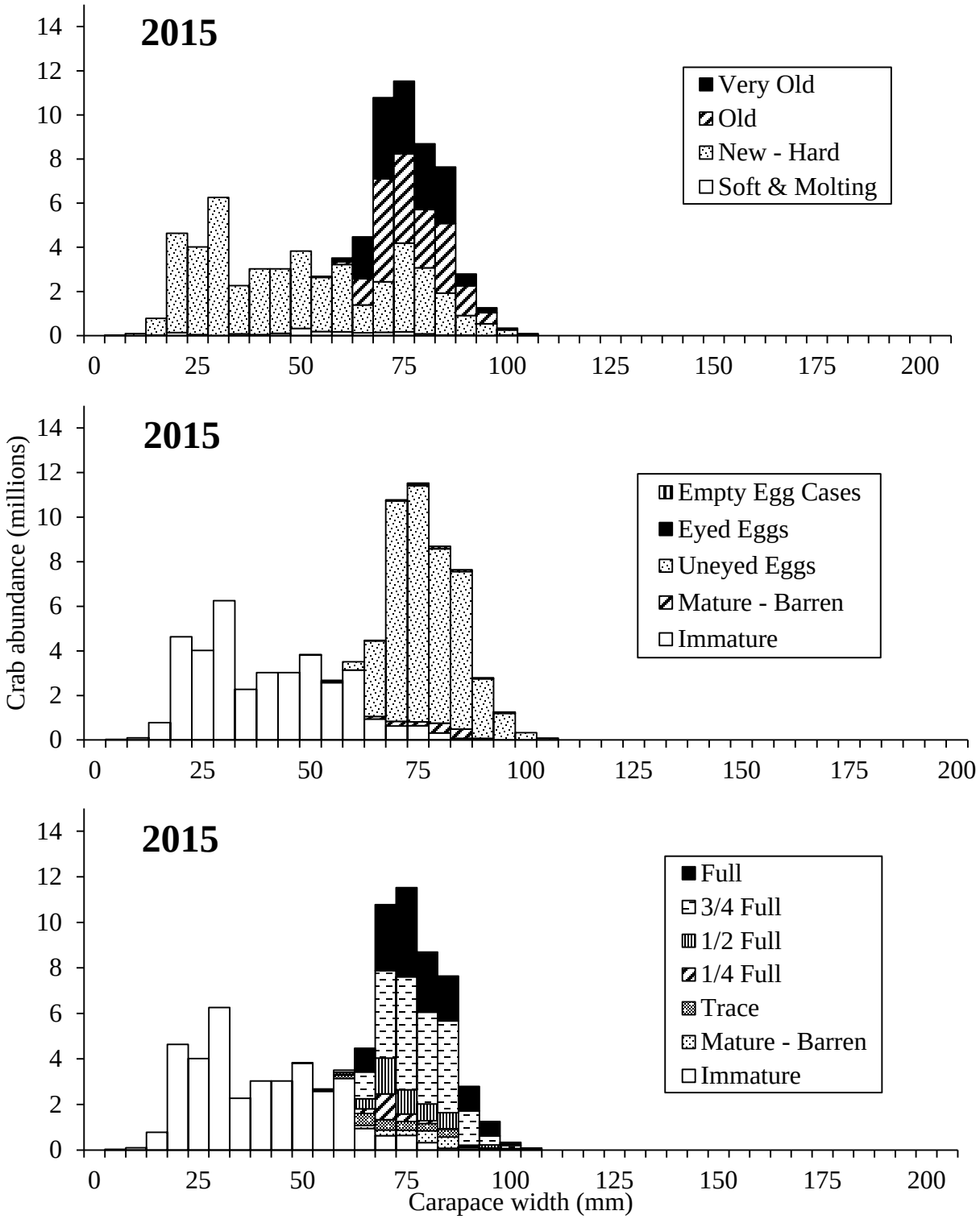

Figure 61. -- Size frequency by shell condition, egg condition, and clutch fullness of female Tanner crab (*Chionoecetes bairdi*) west of 166° by 5 mm width classes of all districts combined in 2015.

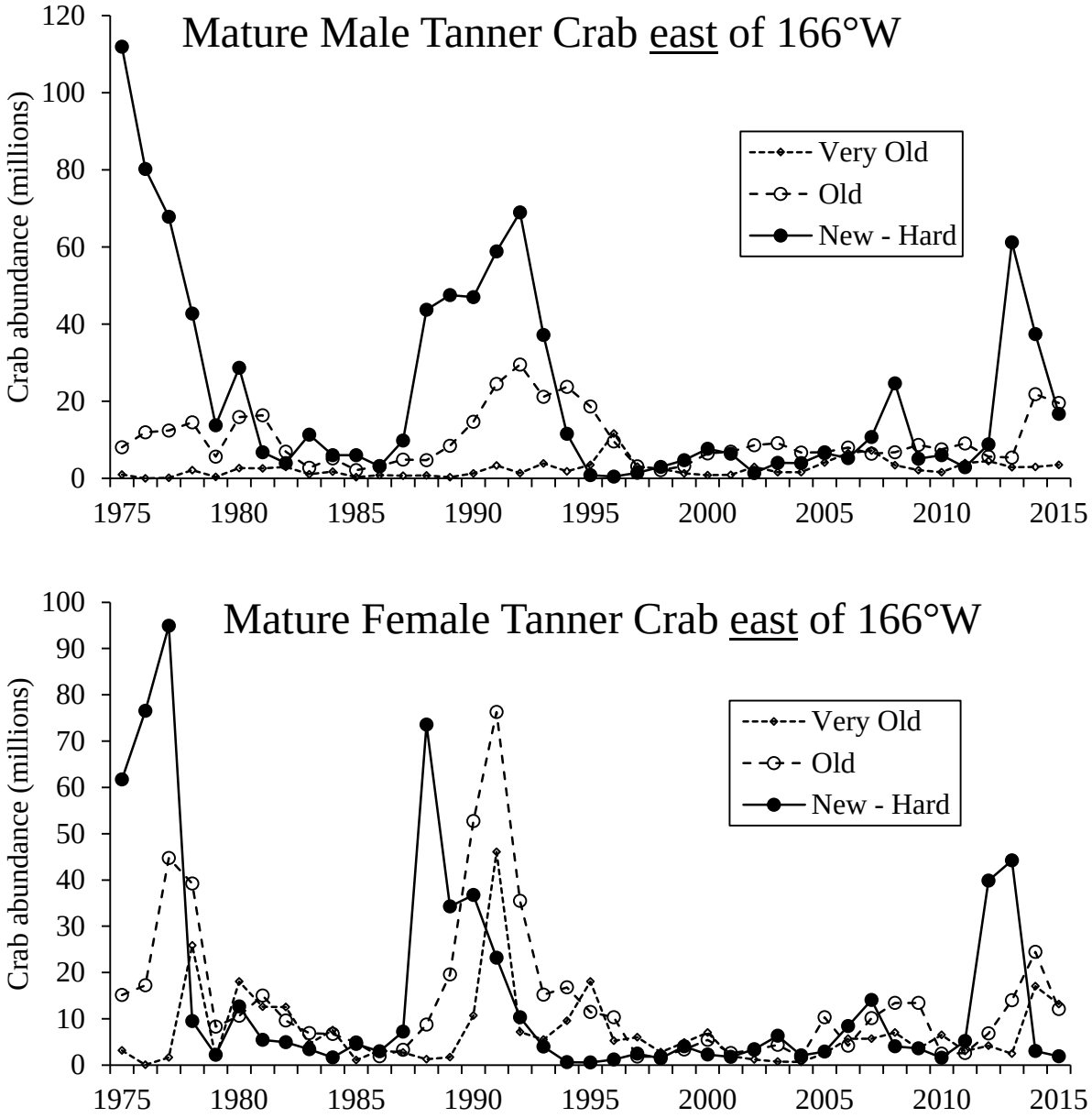

Figure 62. -- Time series of mature male (≥ 113 mm CW) and female (actual maturity) Tanner crab (*Chionoecetes bairdi*) east of 166° W by shell condition, 1975-2015. New-Hard = shell condition 2; Old = shell condition 3; Very Old = shell condition 4 and 5 combined.

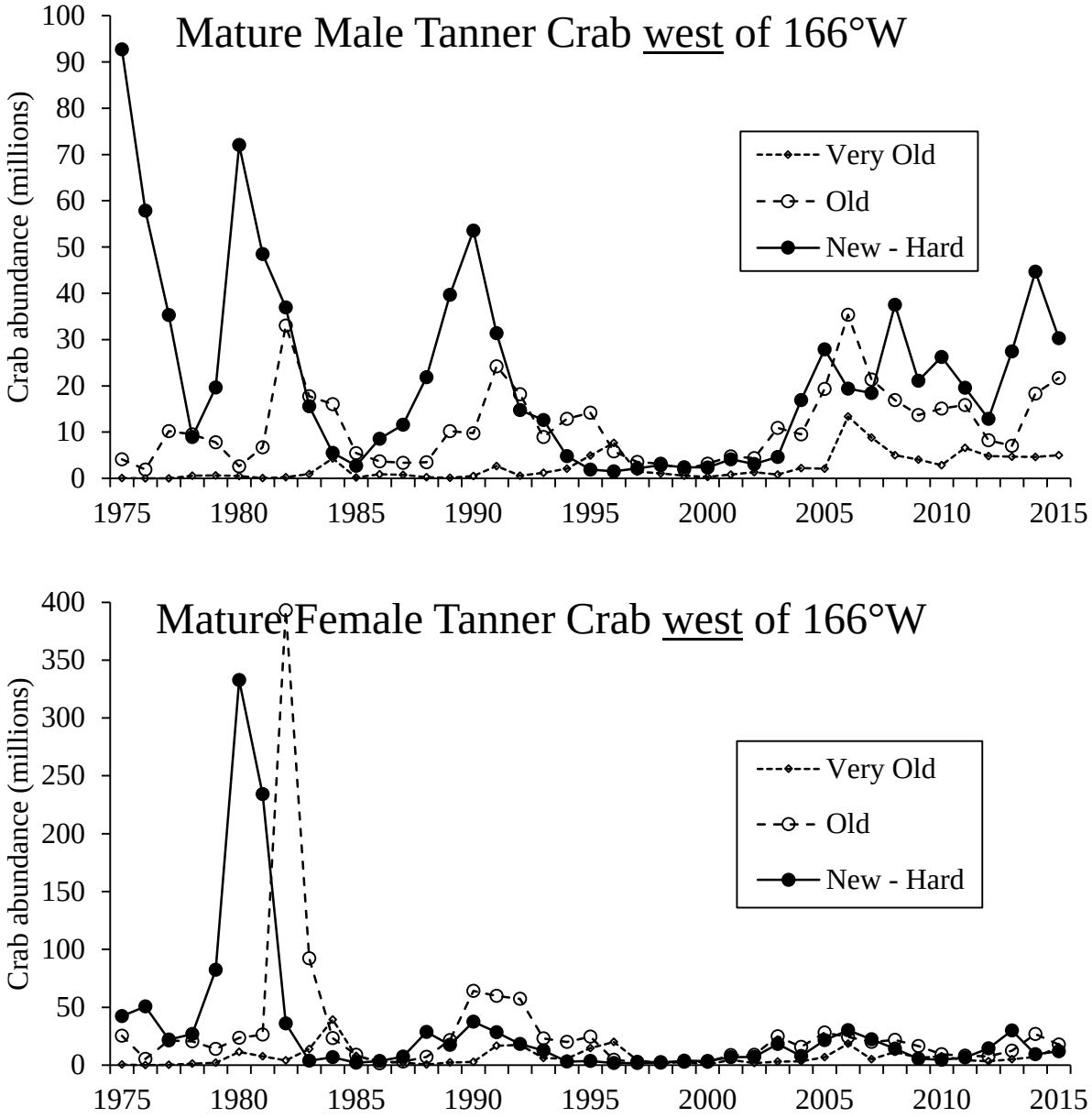

Figure 63. -- Time series of mature male (≥ 103 mm CW) and female (actual maturity) Tanner crab (*Chionoecetes bairdi*) west of 166° W by shell condition, 1975-2015. New-Hard = shell condition 2; Old = shell condition 3; Very Old = shell condition 4 and 5 combined.

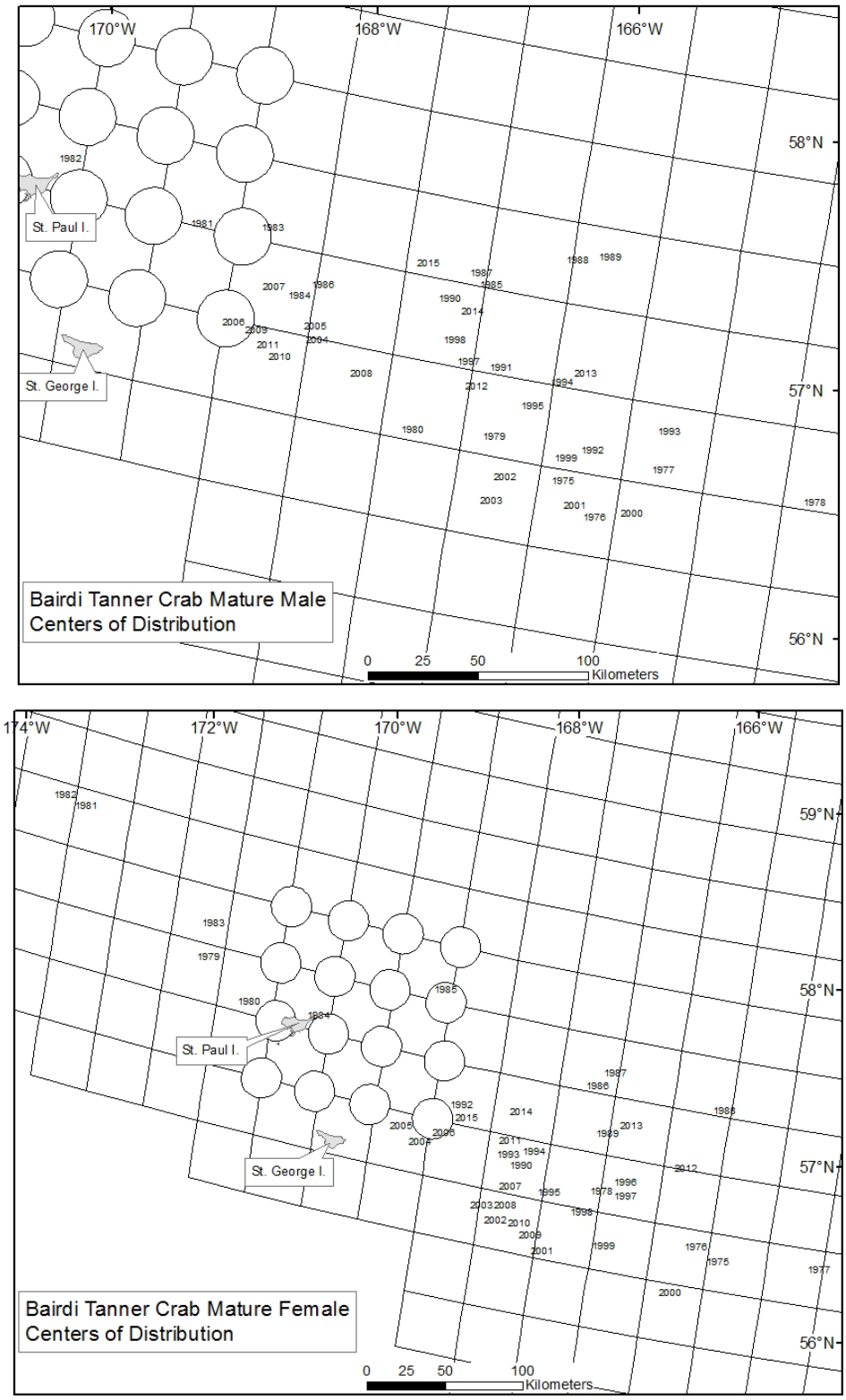

Figure 64. -- Centers of stock distribution of male and female Tanner crab (*Chionoecetes bairdi*) from 1975 to 2015.

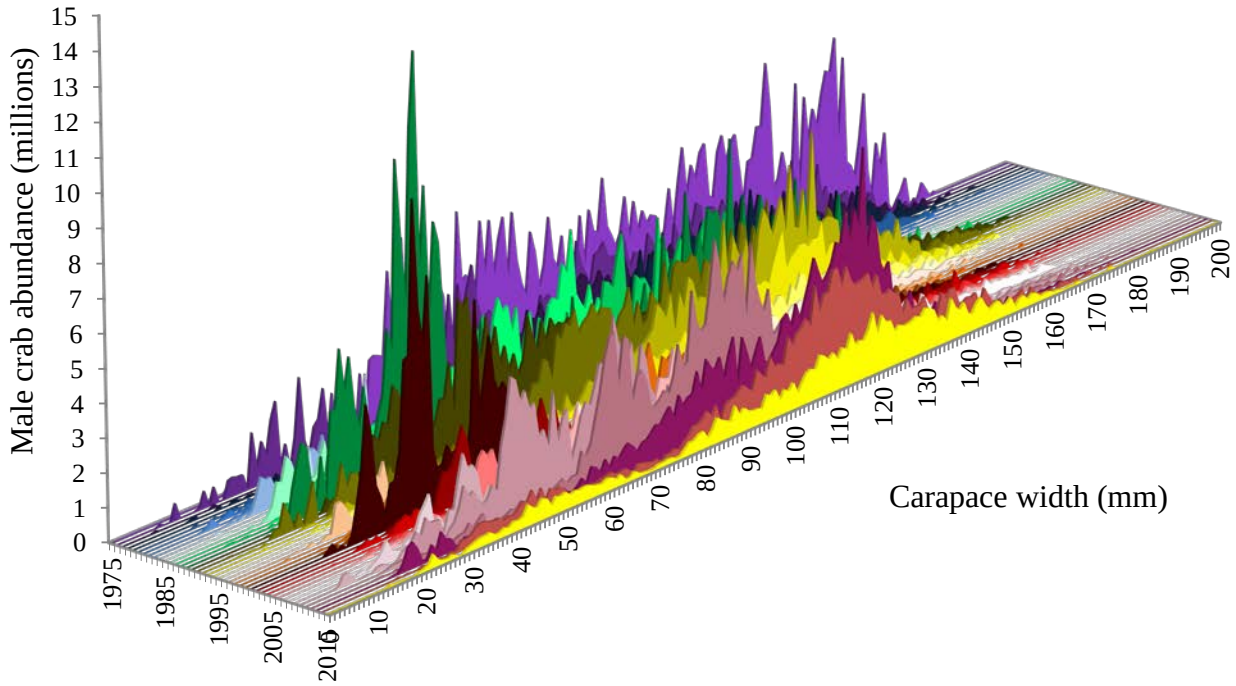

Figure 65. -- Historical size frequency by 1 mm width classes of male Tanner crab (*Chionoecetes bairdi*) east of 166°W, 1975 to 2015.

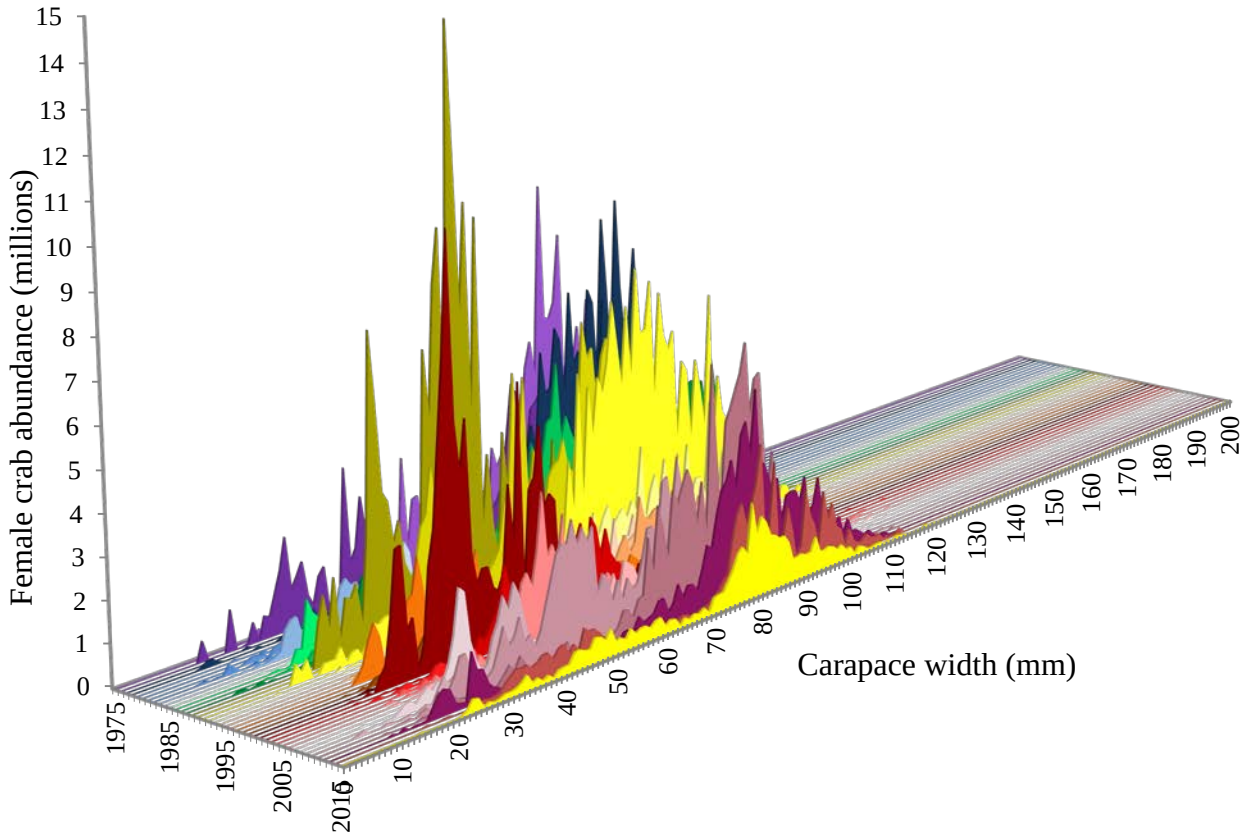

Figure 66. -- Historical size frequency by 1 mm width classes of female Tanner crab (*Chionoecetes bairdi*) east of 166°W, 1975 to 2015.

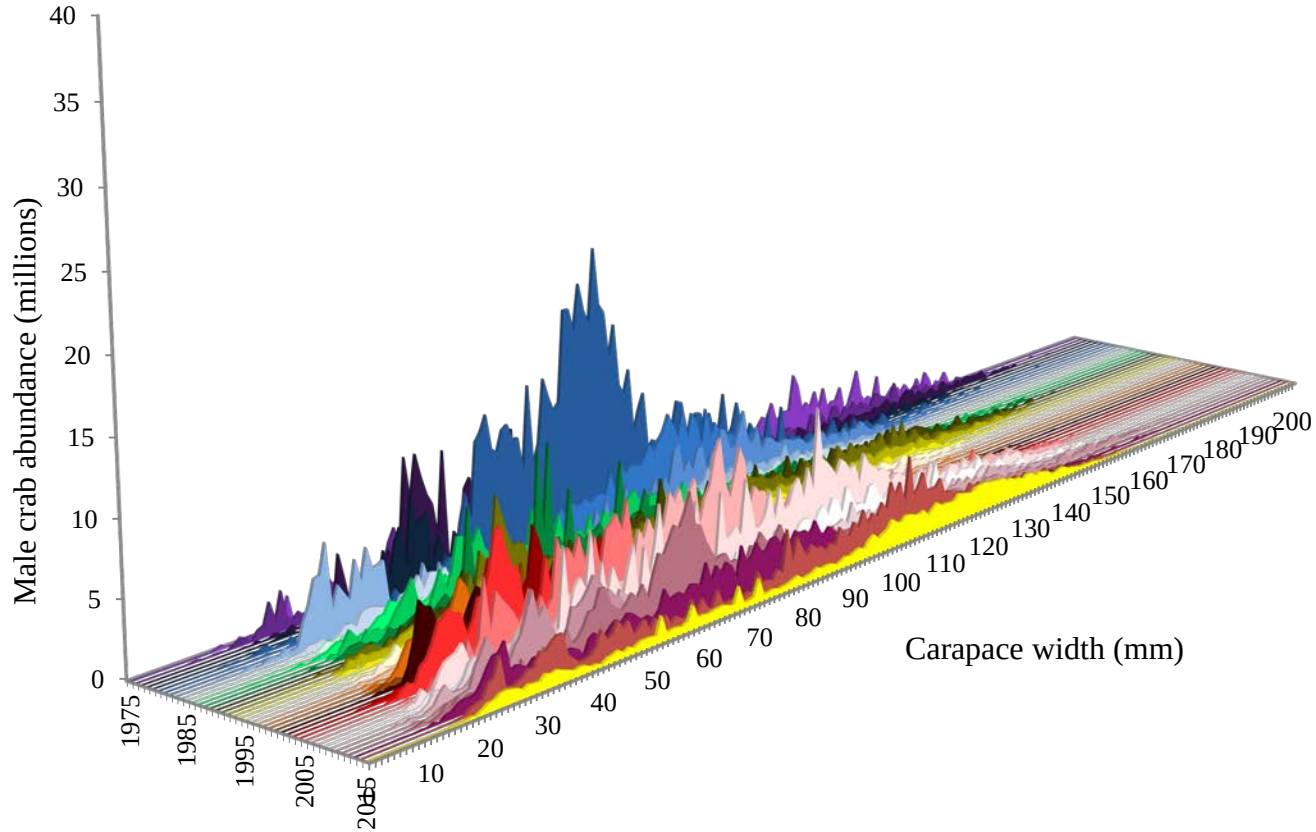

Figure 67. -- Historical size frequency by 1 mm width classes of male Tanner crab (*Chionoecetes bairdi*) west of 166°W, 1975 to 2015.

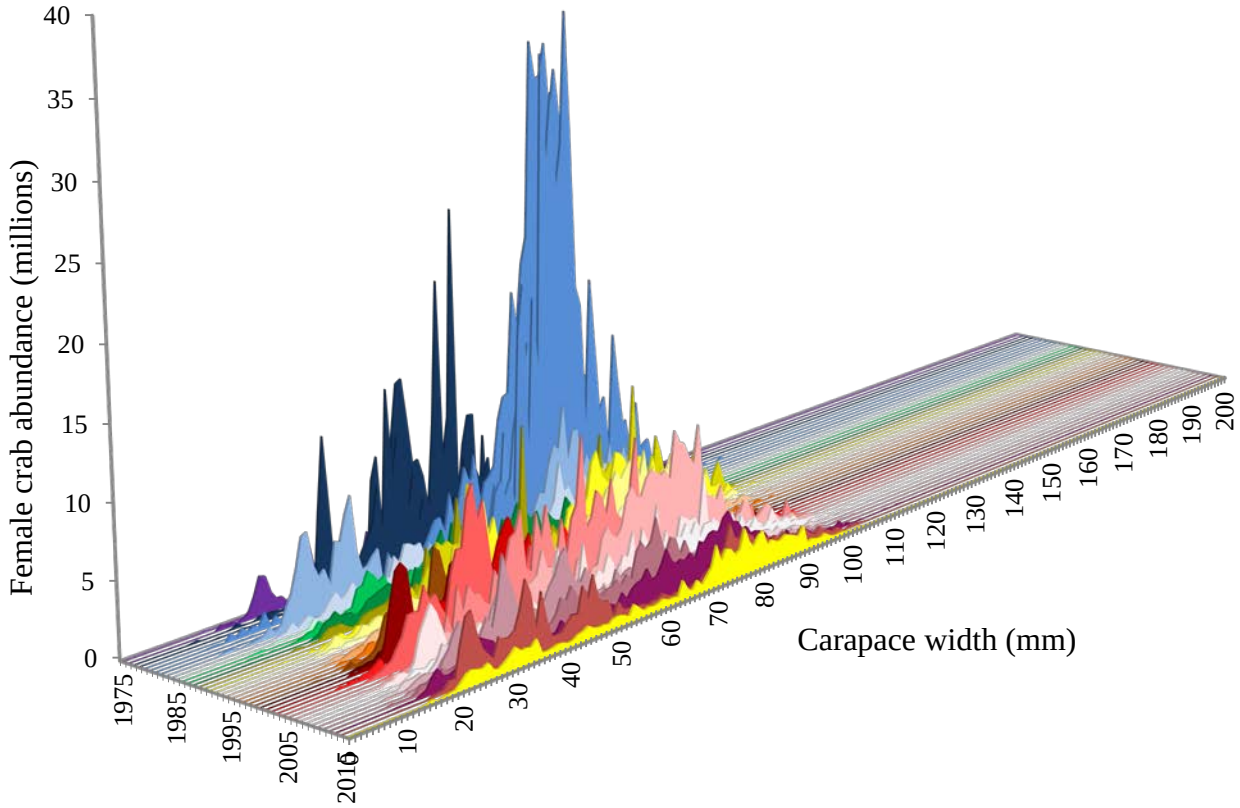

Figure 68. -- Historical size frequency by 1 mm width classes of female Tanner crab (*Chionoecetes bairdi*) west of 166°W, 1975 to 2015.

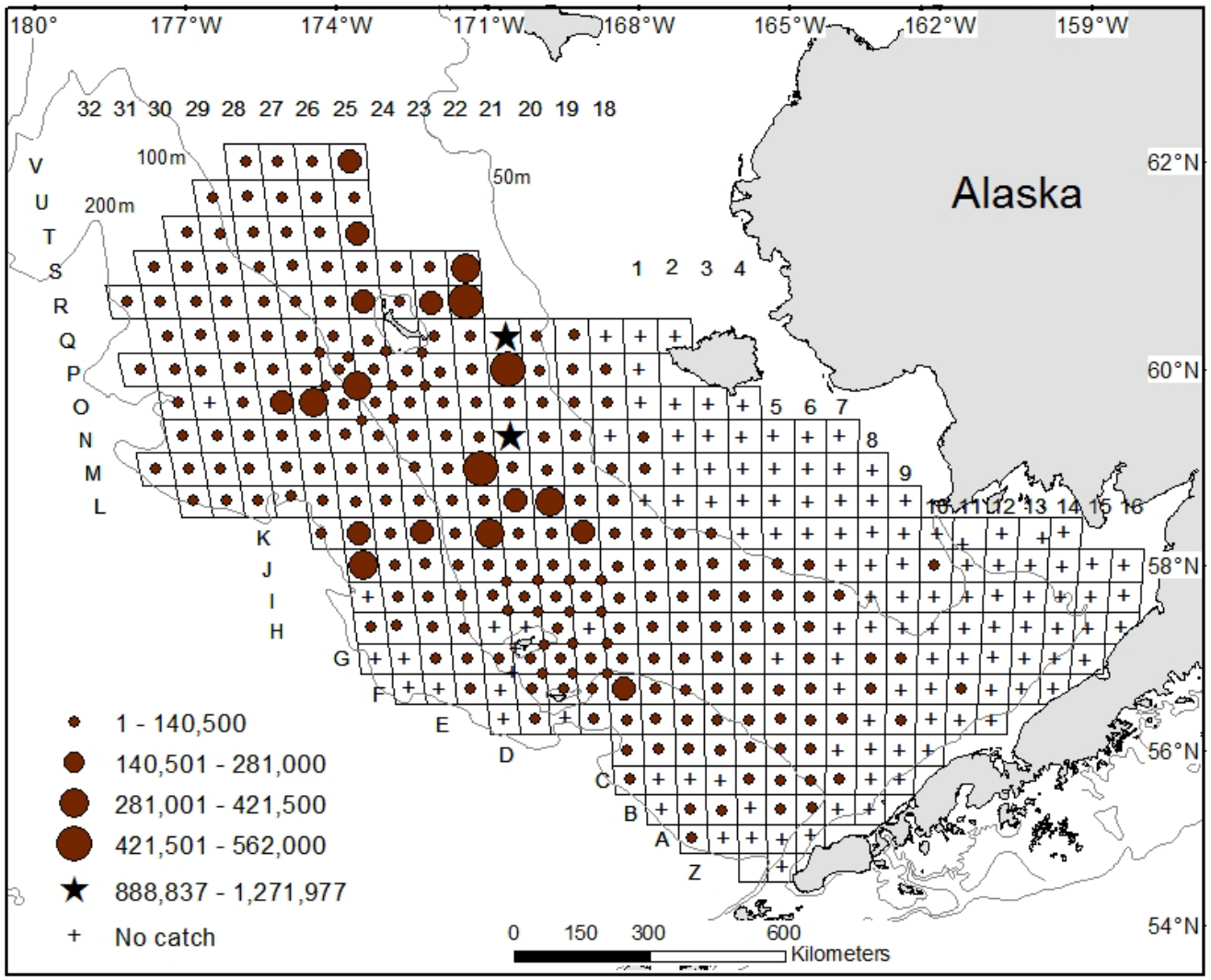

Figure 69. -- Total density (number nmi^{-2}) of snow crab (*Chionoecetes opilio*) at each station sampled in 2015. Data depicted by circles are equal interval densities, while stars are densities larger than the standard scale.

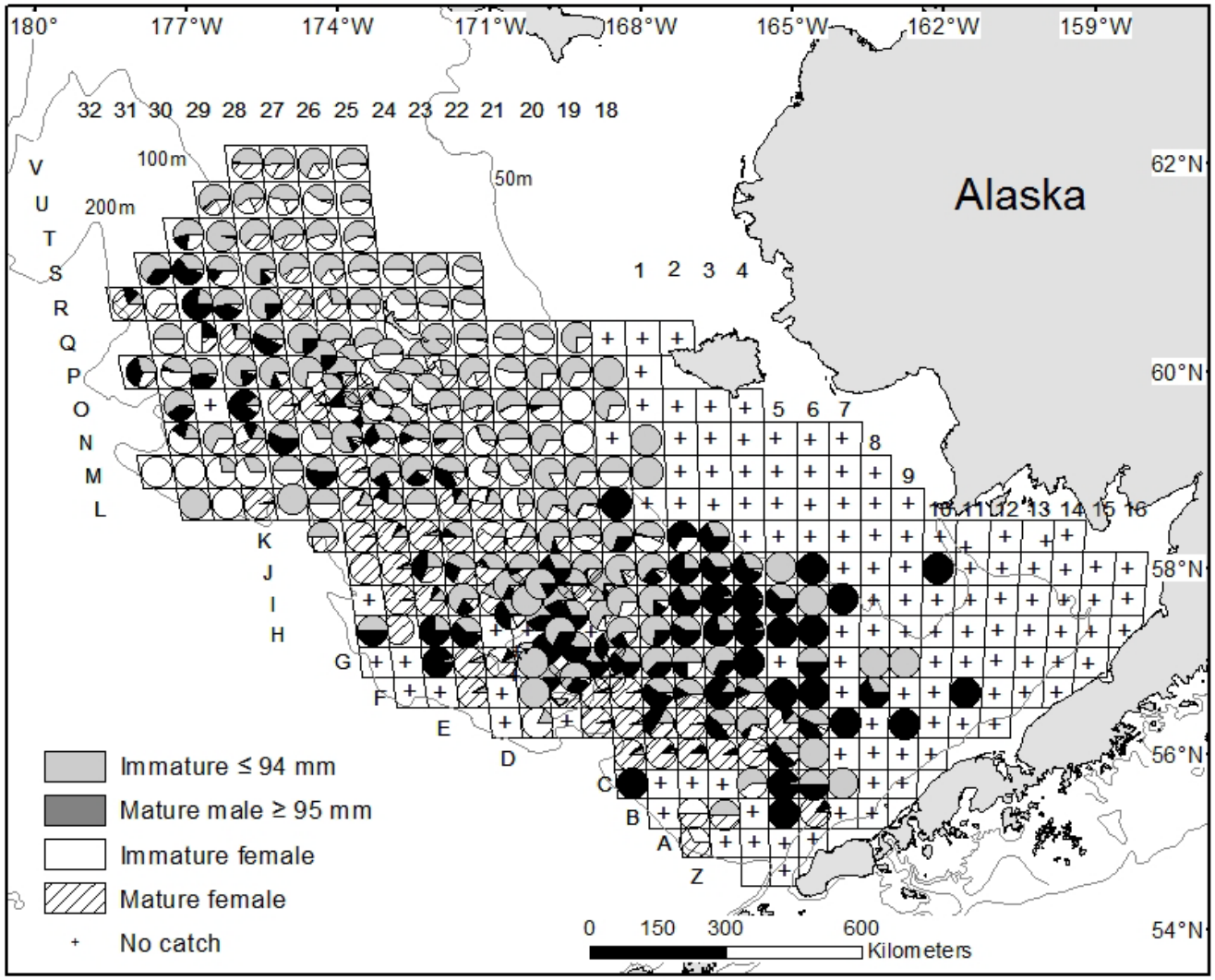

Figure 70. -- Percentage of male and female snow crab (*Chionoecetes opilio*) maturity categories at each station sampled in 2015.

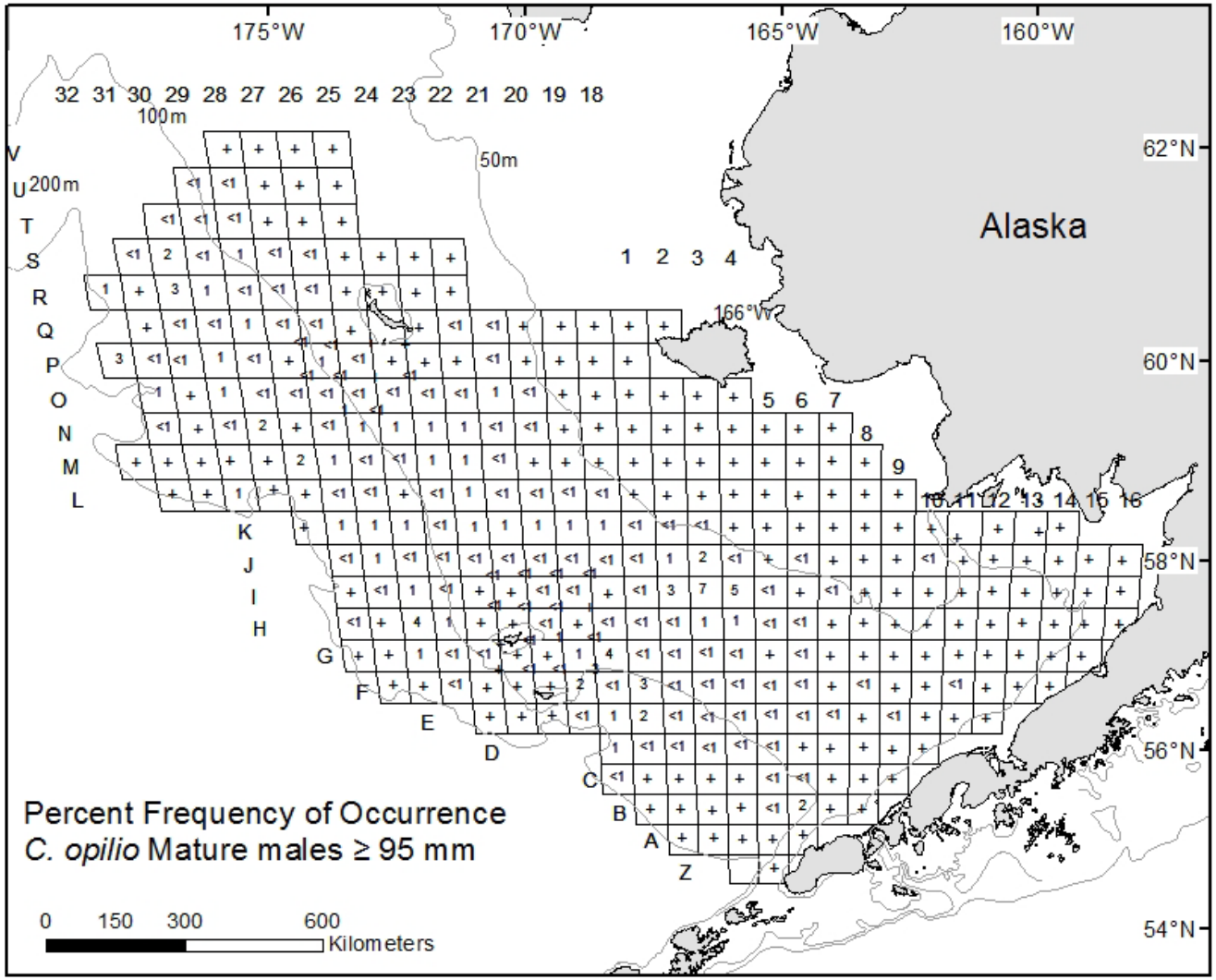

Figure 71. -- Percent frequency of occurrence of mature male snow crab (*Chionoecetes opilio*) at stations sampled in 2015.

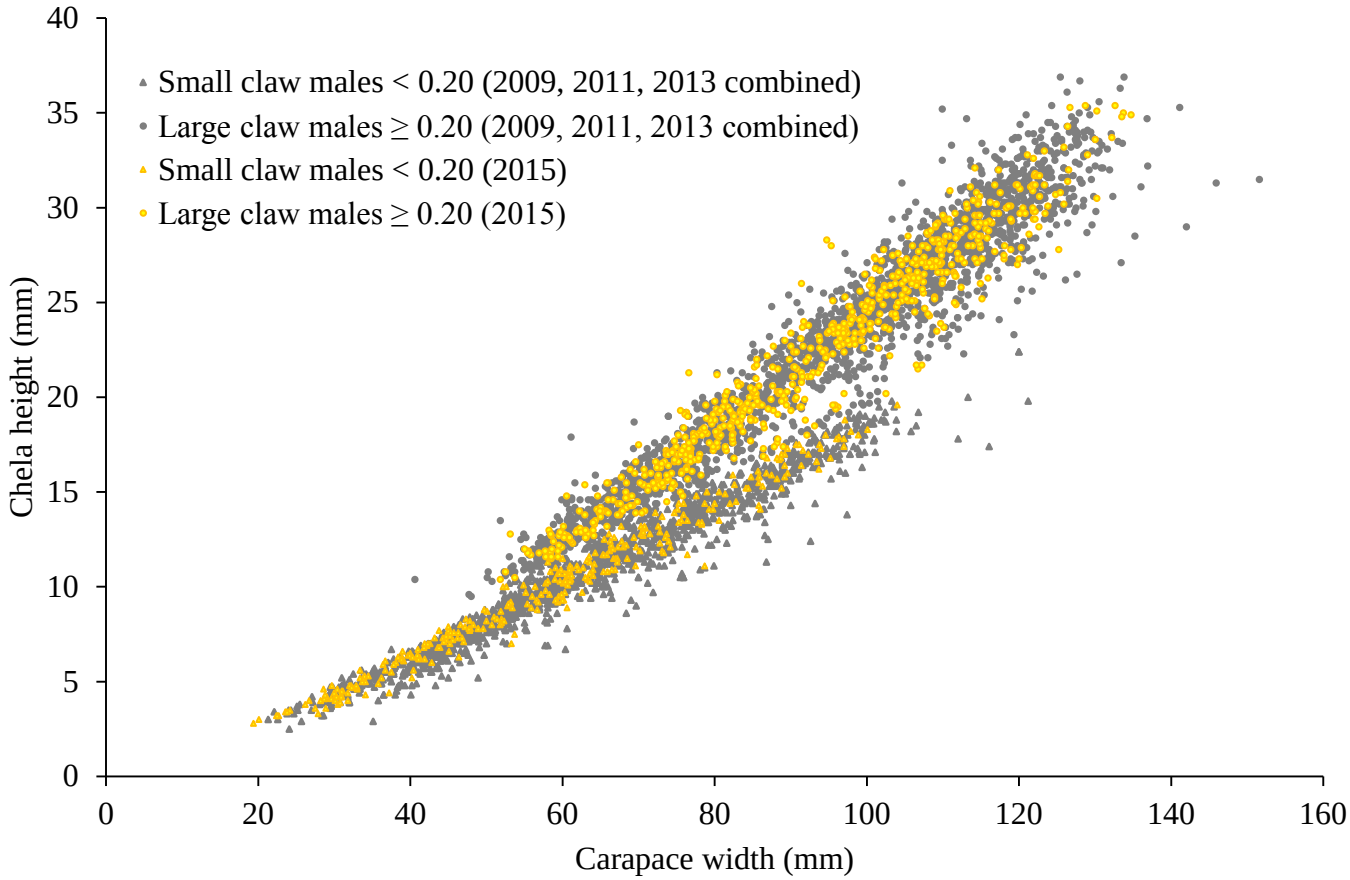

Figure 72. -- Male snow crab (*Chionoecetes opilio*) chela height versus carapace width measurements collected during the 2009, 2011, 2013, and 2015 (all years combined, n = 4,606) National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. 2009, 2011, and 2013 data combined are indicated by grey, while 2015 data are indicated by yellow.

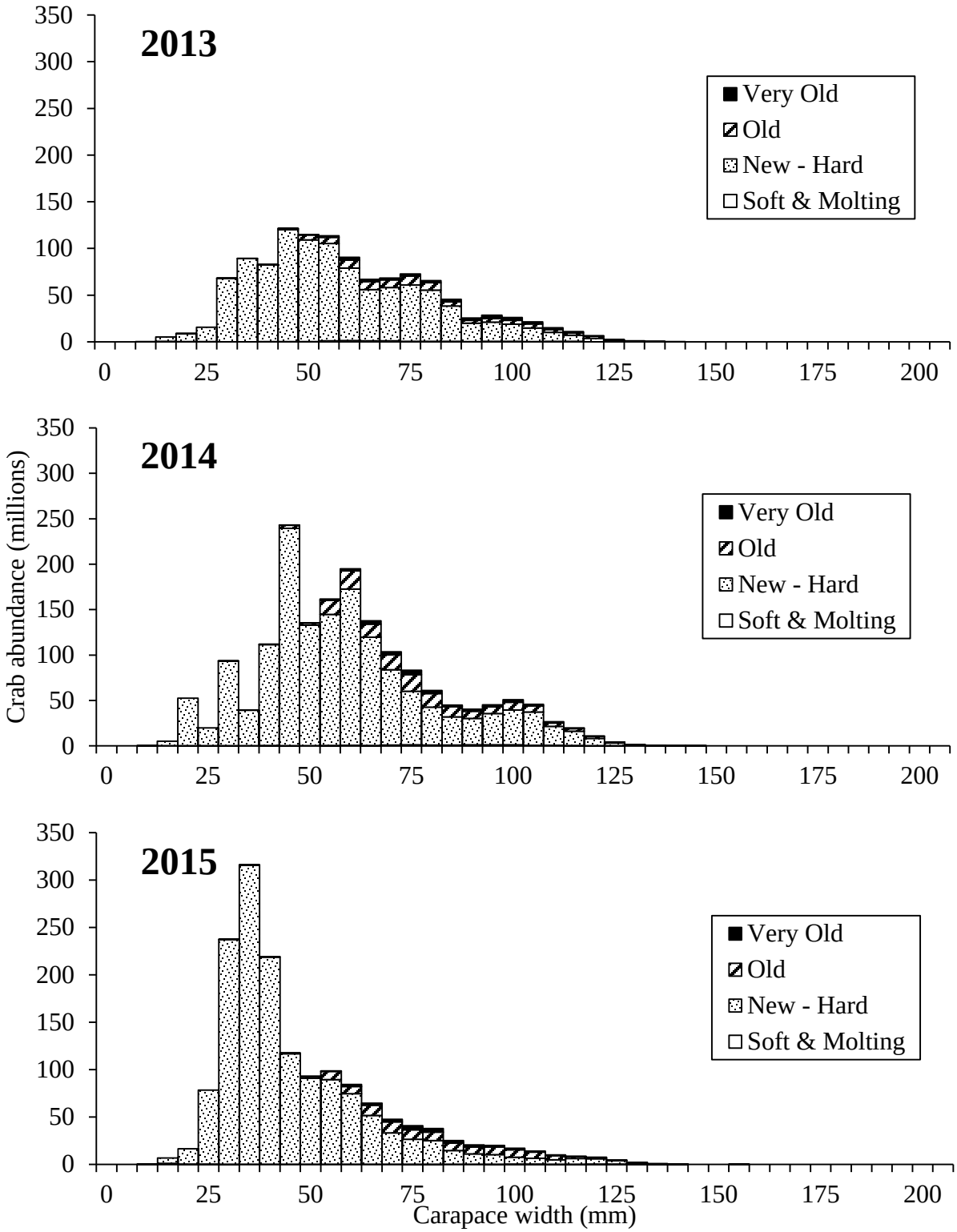

Figure 73. -- Size frequency by shell condition of male snow crab (*Chionoecetes opilio*) by 5 mm width classes of all districts combined, 2013-2015.

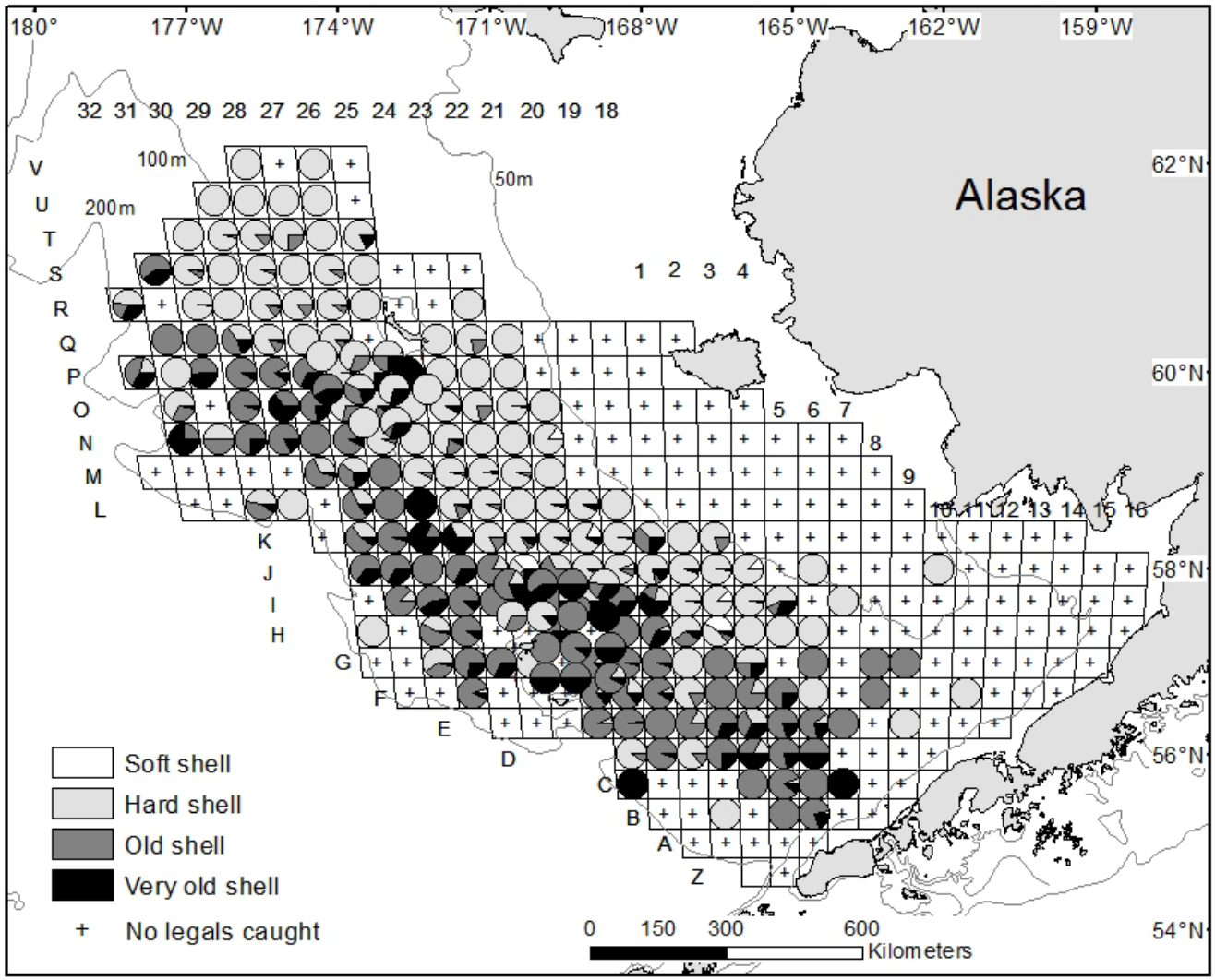

Figure 74. -- Distribution of legal-sized male snow crab (*Chionoecetes opilio*) caught at each station in 2015 and distinguished by shell condition.

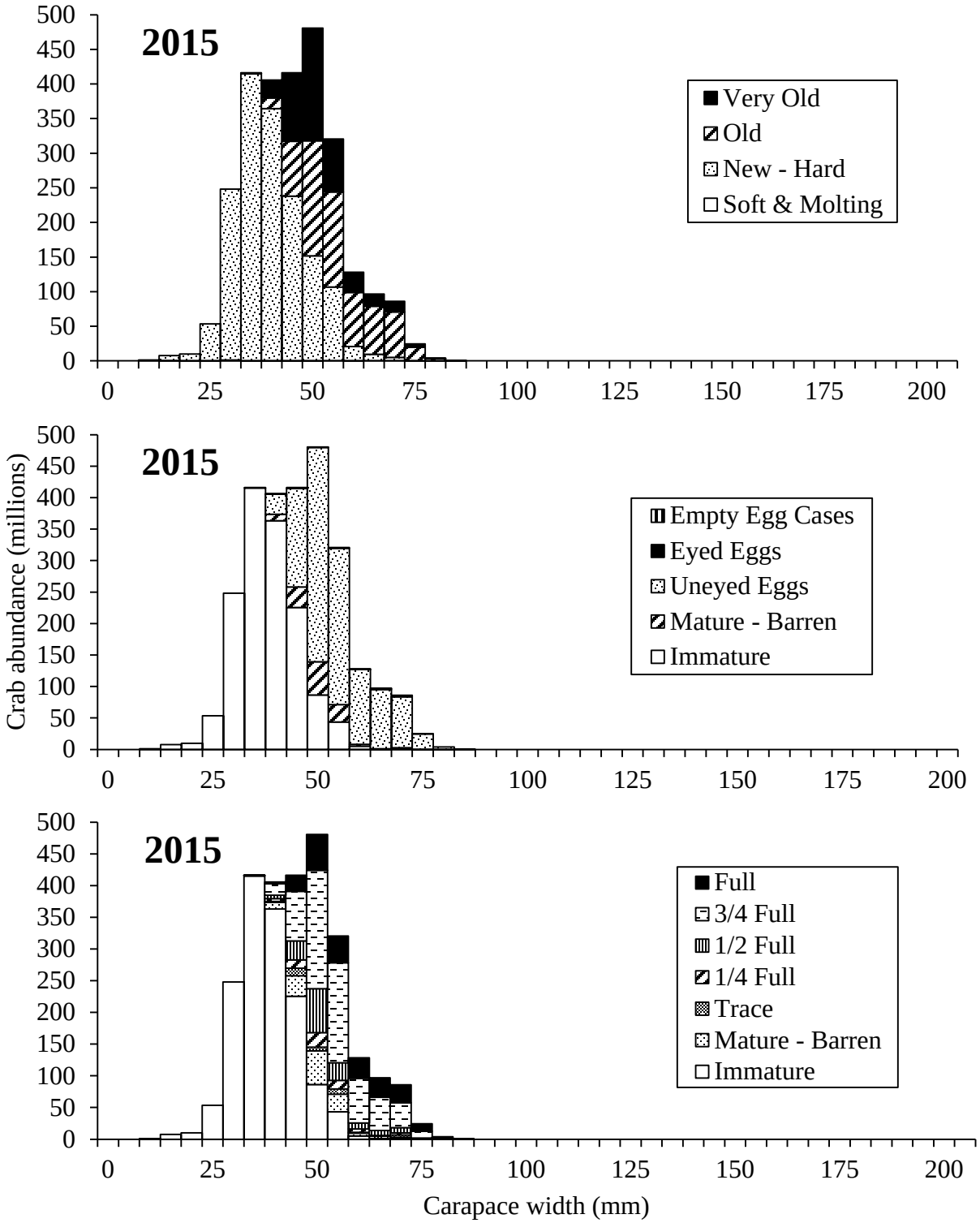

Figure 75. -- Size frequency by shell condition, egg condition, and clutch fullness of female snow crab (*Chionoecetes opilio*) by 5 mm width classes of all districts combined in 2015.

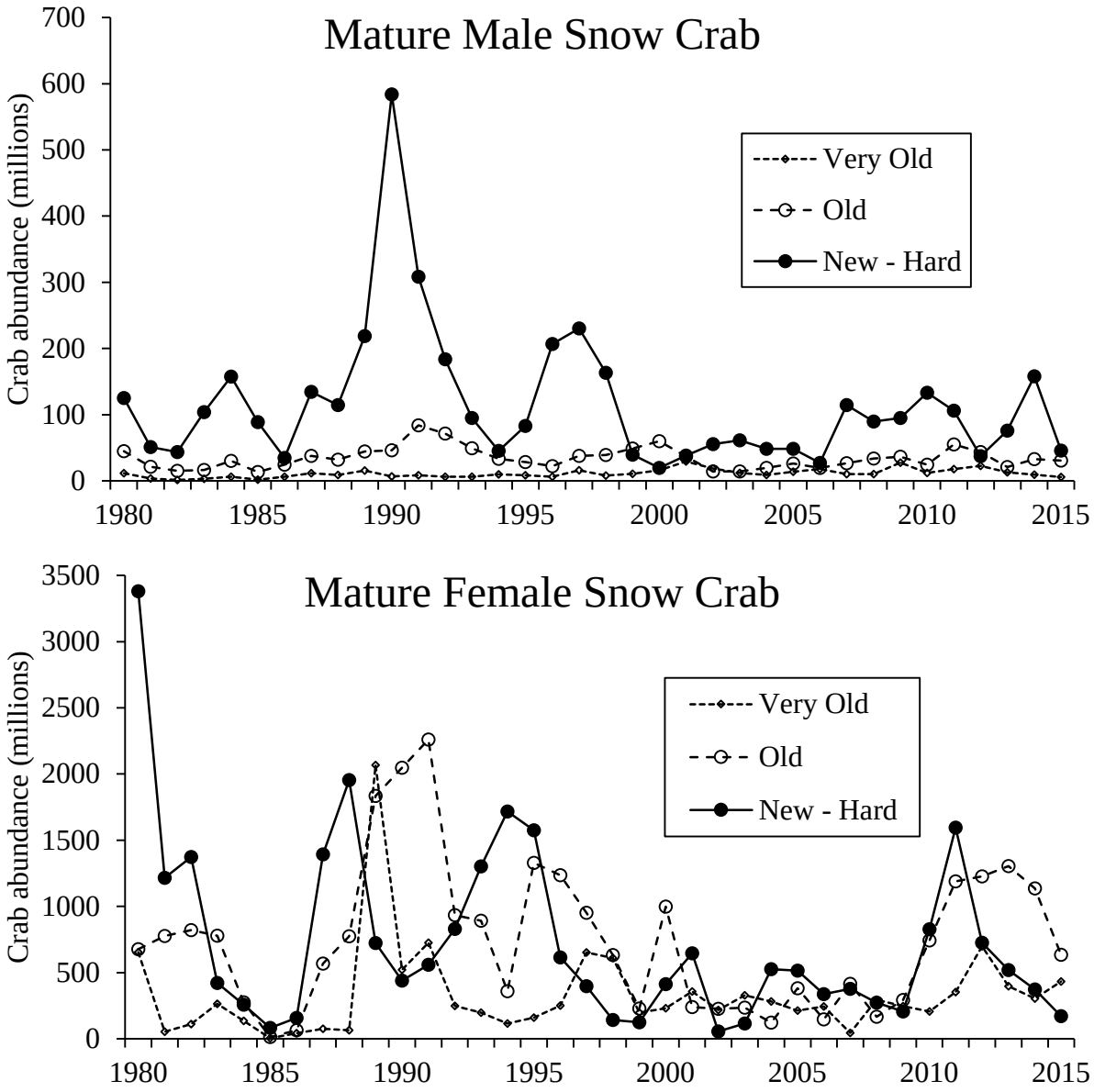

Figure 76. -- Time series of mature male (≥ 95 mm CW) and female (actual maturity) snow crab (*Chionoecetes opilio*) by shell condition, 1980-2015. New- Hard = shell condition 2; Old = shell condition 3; Very Old = shell condition 4 and 5 combined.

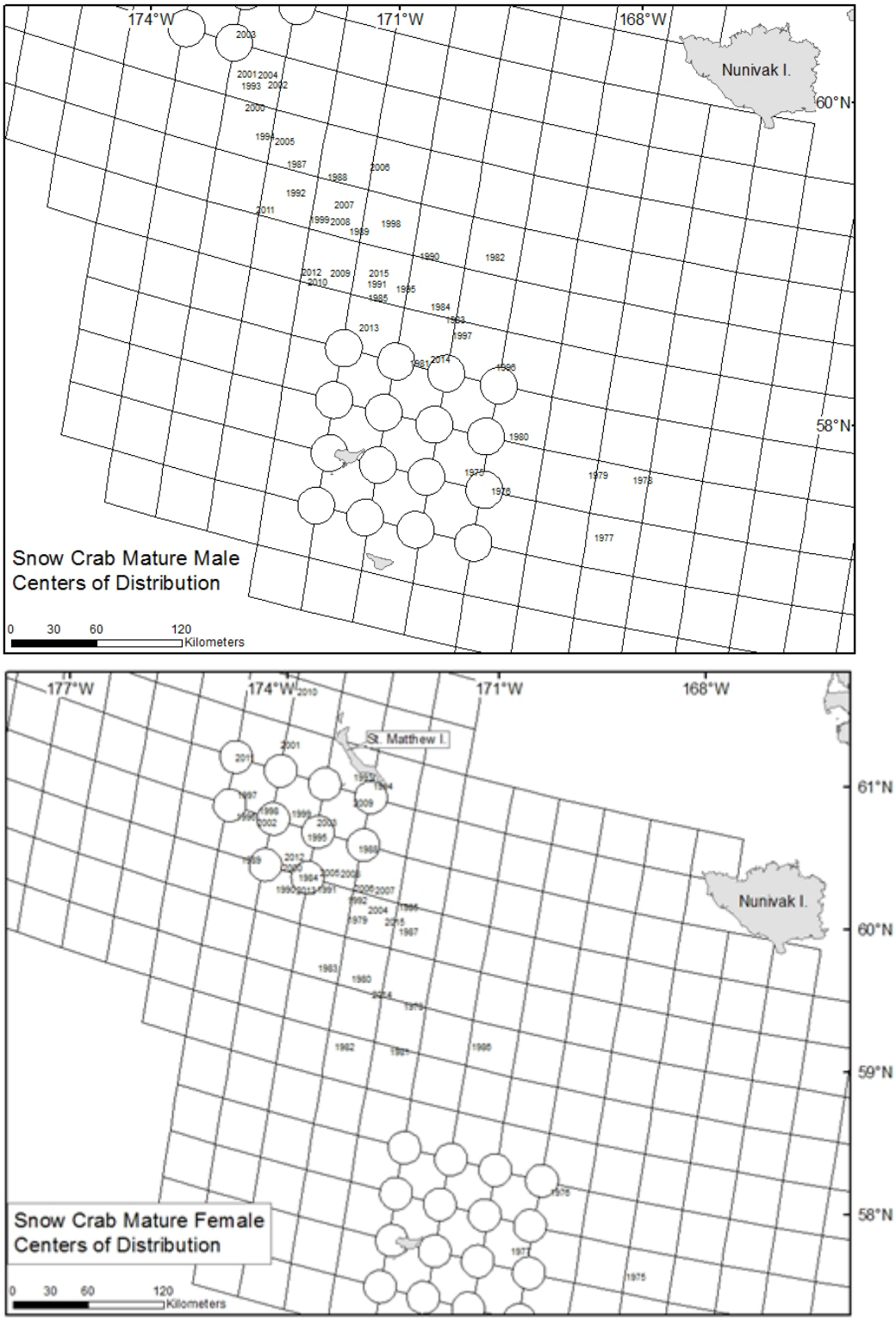

Figure 77. -- Centers of stock distribution of male and female snow crab (*Chionoecetes opilio*) from 1975 to 2015.

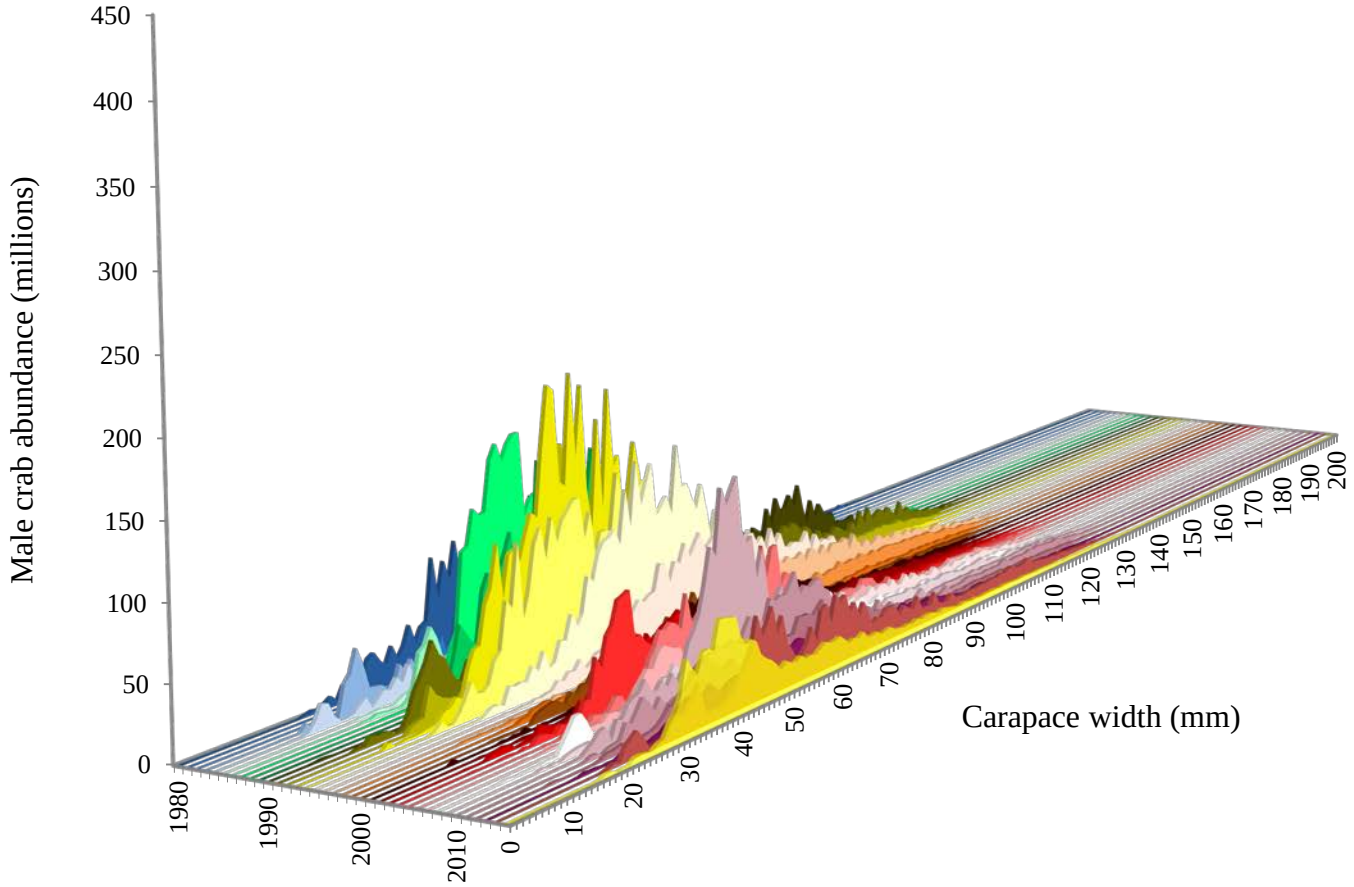

Figure 78. -- Historical size frequency by 1 mm width classes of male snow crab (*Chionoecetes opilio*), 1980 to 2015.

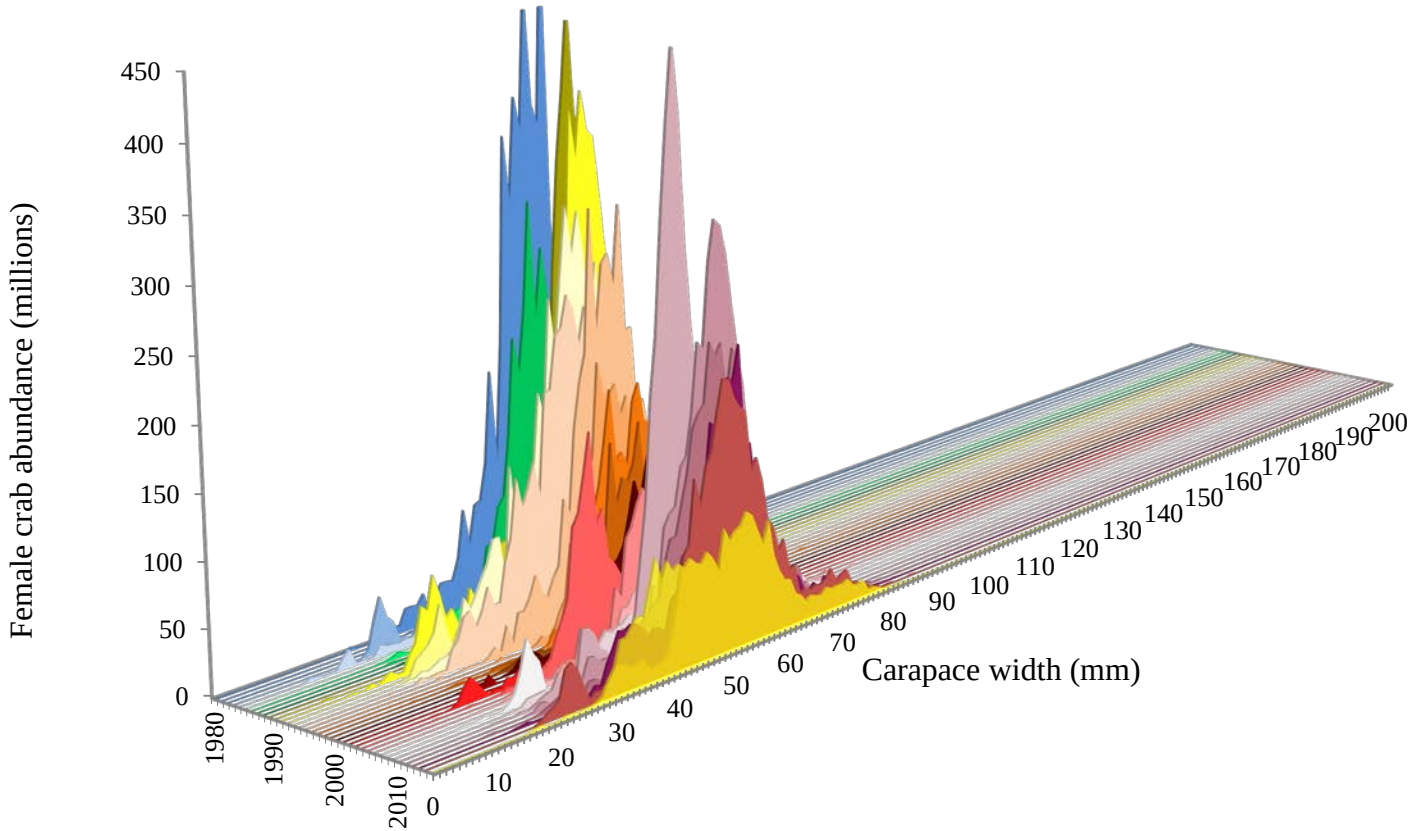

Figure 79. -- Historical size frequency by 1 mm width classes of female snow crab (*Chionoecetes opilio*), 1980 to 2015.

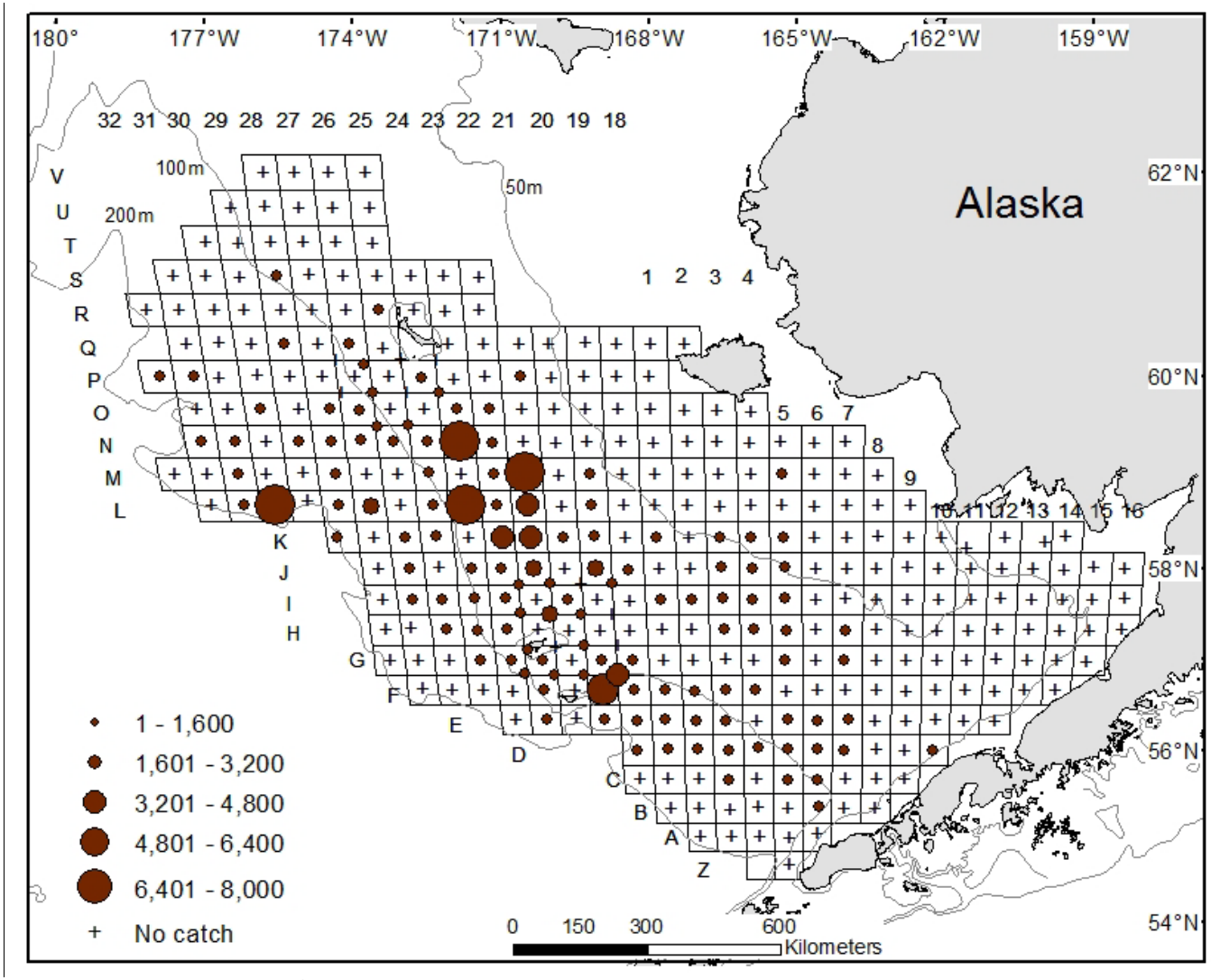

Figure 80. -- Total density (number nmi^{-2}) of *Chionoecetes* spp. hybrid crab at each station sampled in 2015. Data depicted by circles are crab densities at equal intervals.

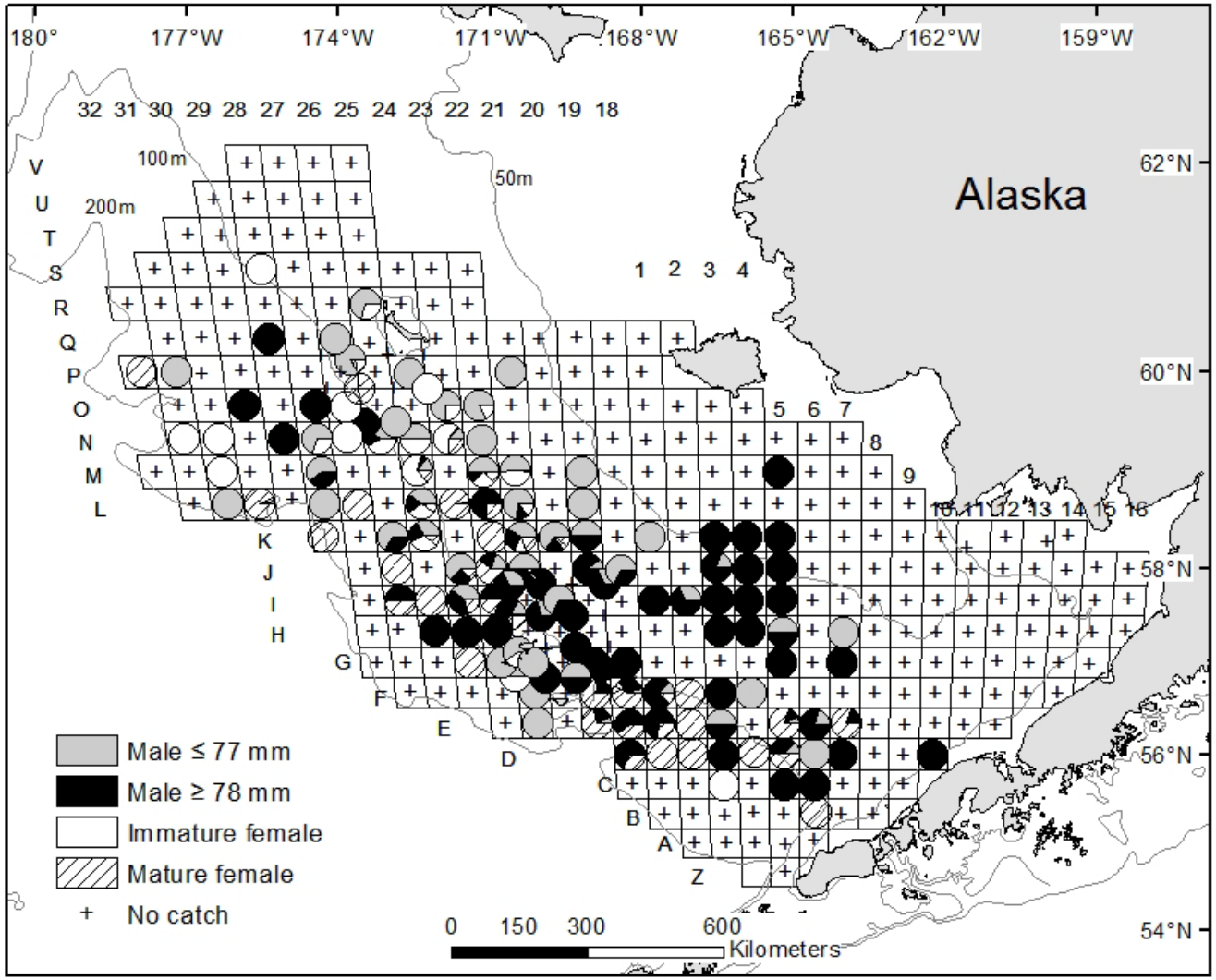

Figure 81. -- Percentage of male and female *Chionoecetes* spp. hybrid crab size and maturity categories at each station sampled in 2015.

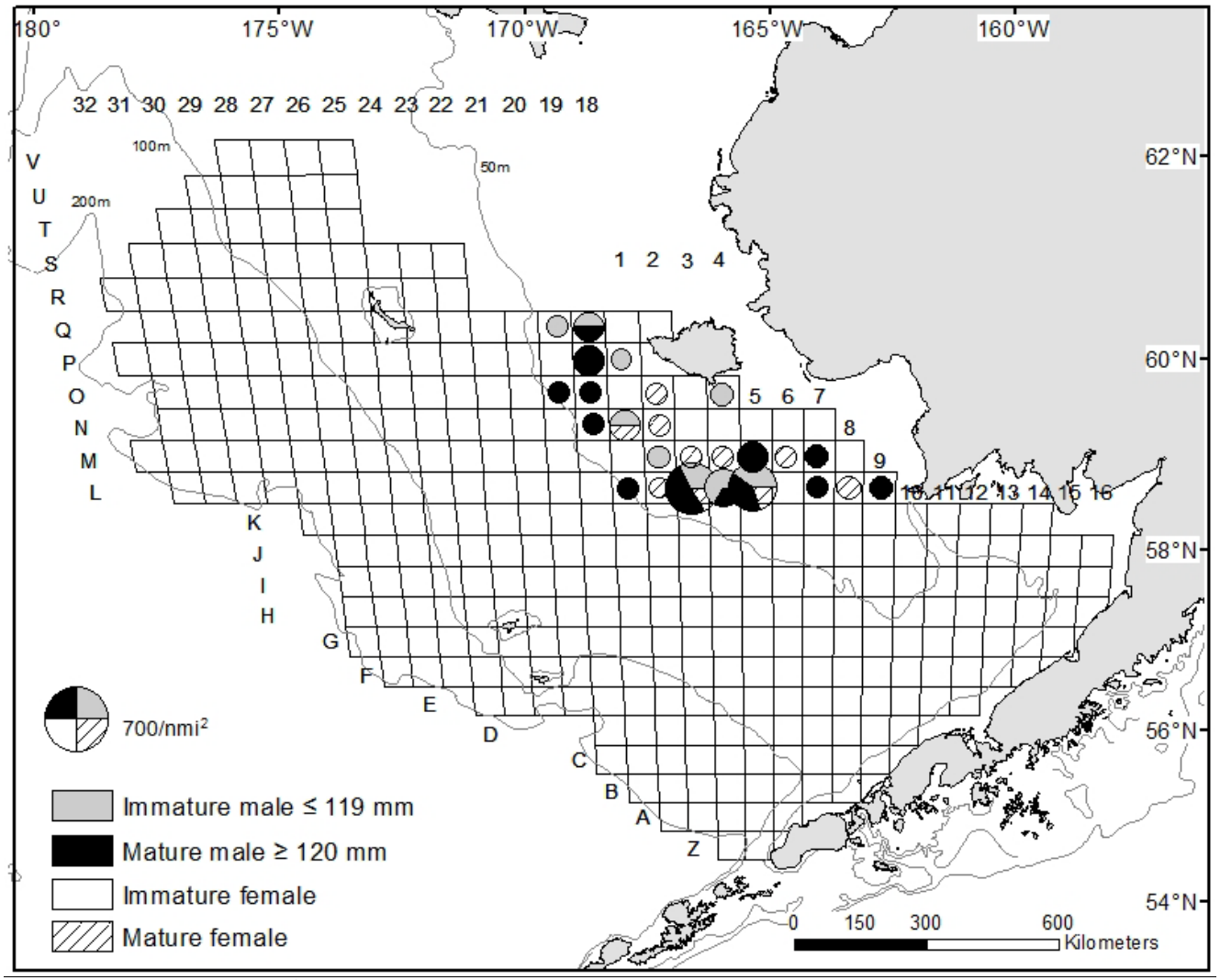

Figure 82. -- Total density (number nmi^{-2}) and percentage of male and female red king crab (*Paralithodes camtschaticus*) maturity categories at each station sampled in the Northern District in 2015.

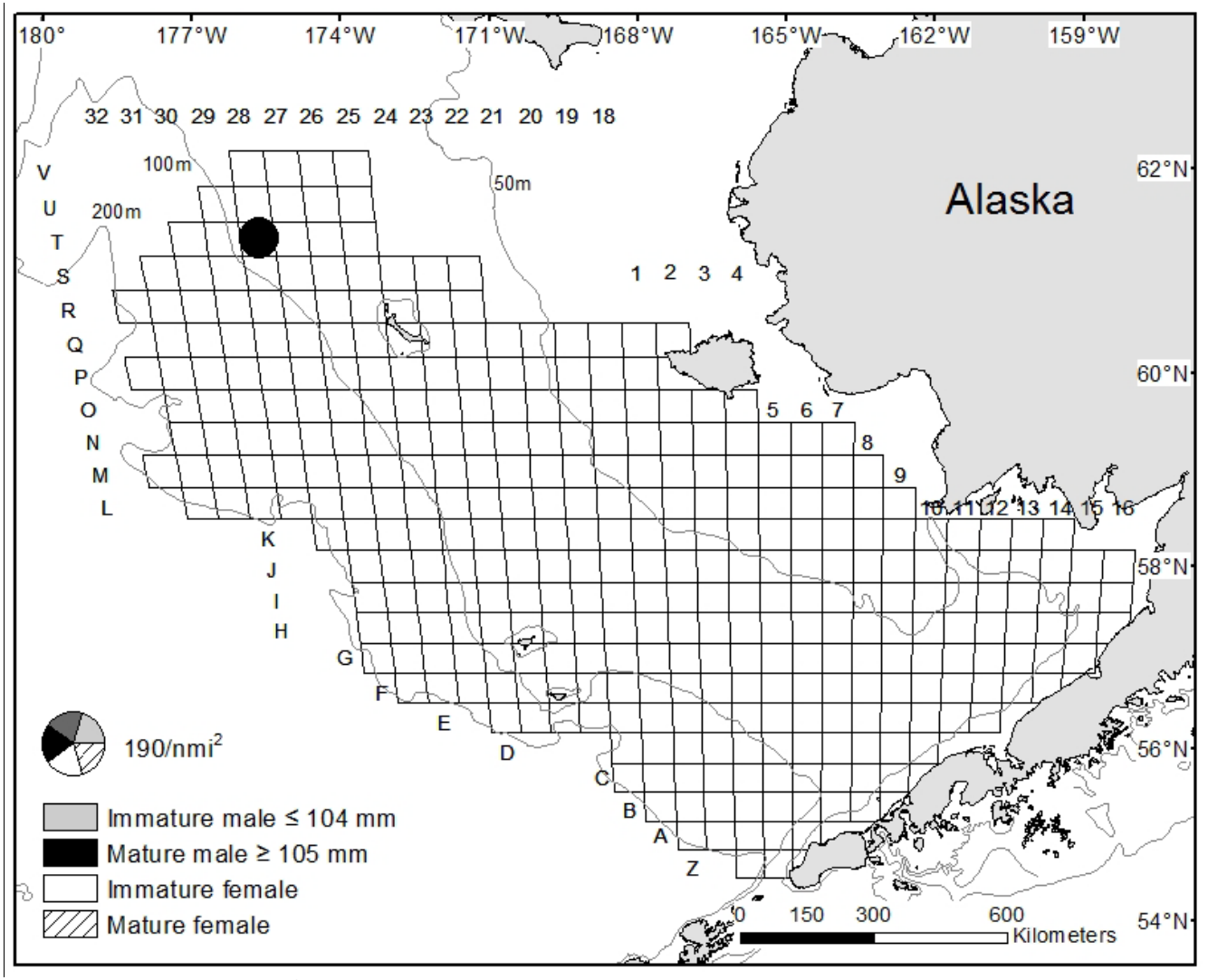

Figure 83. -- Total density (number nmi^{-2}) and percentage of male and female blue king crab (*Paralithodes platypus*) size and maturity categories at stations sampled outside of the Pribilof District and St. Matthew Island section of the Northern District in 2015.

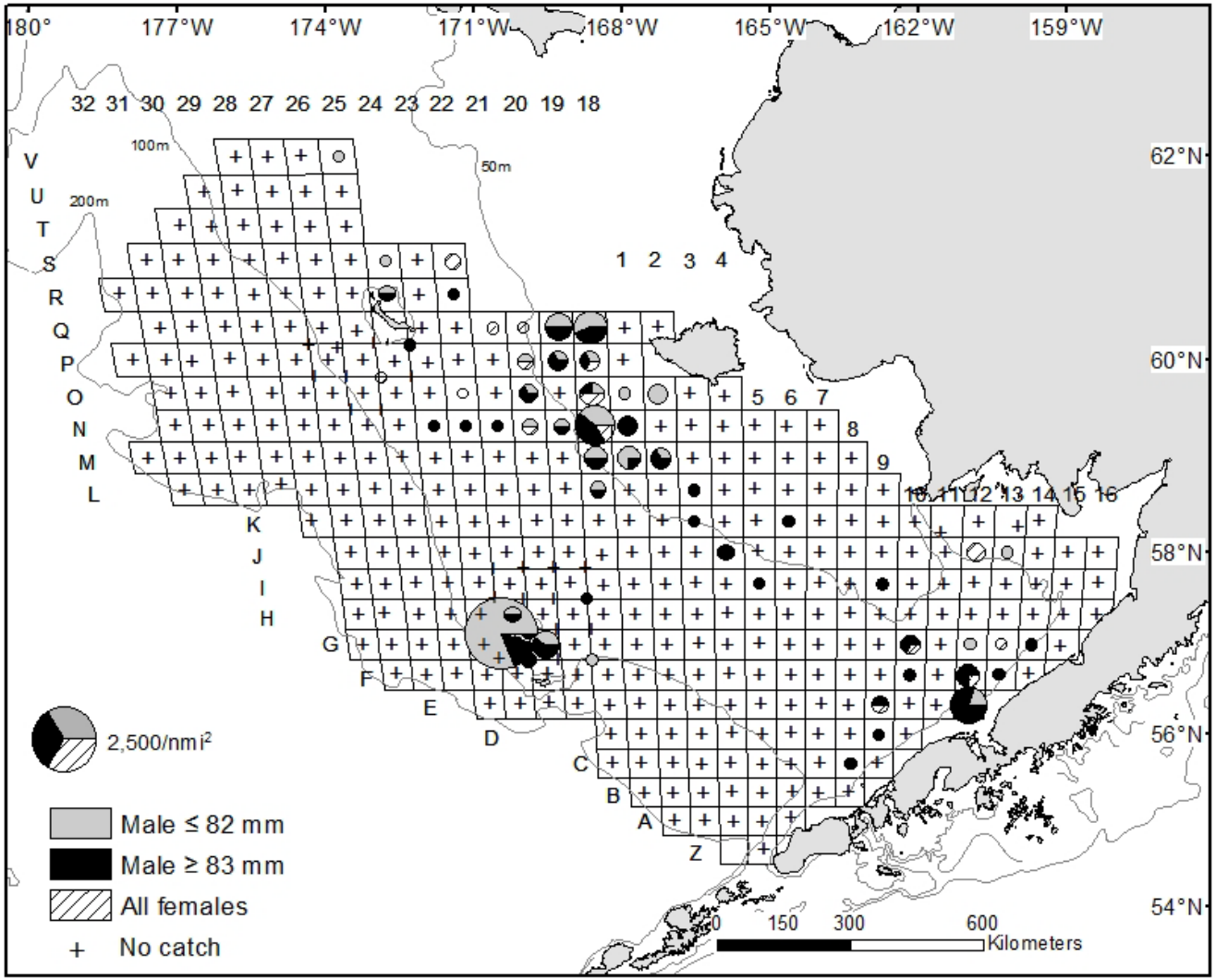

Figure 84. -- Total density (number nmi^{-2}) and percentage of male and female hair crab (*Erimacrus isenbeckii*) size categories at each station sampled in 2015.

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	A-02	A-03	A-04	A-05	A-06	B-01	B-02	B-03	B-04	B-05	B-06
Start Date	06/21/2015	06/21/2015	06/21/2015	06/09/2015	06/09/2015	06/22/2015	06/22/2015	06/17/2015	06/17/2015	06/11/2015	06/09/2015
Duration (hour)	0.53	0.51	0.53	0.52	0.51	0.51	0.51	0.51	0.51	0.53	0.53
Distance Fished (km)	2.93	2.76	2.86	2.92	2.73	2.78	2.85	2.86	2.8	3.01	2.88
Mid-Latitude (ºN)	55.01	55.01	55	55	55.04	55.33	55.34	55.32	55.34	55.33	55.35
Mid-Longitude (ºW)	-166.94	-166.32	-165.75	-165.15	-164.58	-167.55	-166.97	-166.34	-165.79	-165.17	-164.56
Bottom Depth (m)	155	142	130	111	65	149	140	133	120	112	101
Bottom Temperature (ºC)	4.5	4.6	4.8	4.9	5.8	4.4	4.9	4.7	4.8	5.1	5.1
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	7,078	3,444	1,064	1,075	0	3,935	5,002	9,324	2,744	386	1,137
Mature males	869	1,192	133	202	0	271	59	601	936	514	3,411
Legal	559	927	67	67	0	136	59	481	748	321	2,629
Immature females	4,643	1,798	1,663	806	0	6,784	5,270	6,755	1,247	321	355
Mature females	3,482	9,269	133	0	0	1,085	4,239	2,225	2,058	64	0
Total weight (kg)	25.45	39.26	3.17	3.68	0.00	9.33	17.93	25.18	22.94	6.41	42.71
Opilio Tanner Crab											
Immature males	0	0	0	0	0	0	0	60	0	0	1,990
Mature males	0	0	0	0	0	0	0	0	0	64	4,619
Legal	0	0	0	0	0	0	0	60	0	64	6,325
Immature females	62	0	0	0	0	0	59	0	0	0	0
Mature females	124	0	0	0	0	0	59	60	0	0	38,305
Total weight (kg)	0.27	0.00	0.00	0.00	0.00	0.00	0.11	0.40	0.00	0.57	121.35
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	142
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	B-07	B-08	C-01	C-02	C-03	C-04	C-05	C-06	C-07	C-08	C-09
Start Date	06/09/2015	06/08/2015	06/22/2015	06/22/2015	06/17/2015	06/17/2015	06/11/2015	06/12/2015	06/12/2015	06/08/2015	06/08/2015
Duration (hour)	0.51	0.53	0.52	0.52	0.52	0.52	0.53	0.52	0.52	0.51	0.51
Distance Fished (km)	2.71	2.9	2.76	2.81	2.89	2.82	3	2.88	2.84	2.85	2.71
Mid-Latitude (ºN)	55.33	55.34	55.67	55.67	55.66	55.67	55.65	55.66	55.68	55.66	55.67
Mid-Longitude (ºW)	-164.03	-163.42	-167.6	-166.98	-166.38	-165.8	-165.17	-164.57	-164	-163.38	-162.83
Bottom Depth (m)	78	53	135	135	127	119	110	97	94	82	51
Bottom Temperature (ºC)	5	5.8	5	4.9	5	5.1	5.1	4.9	4.8	4.8	5.6
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	71	0	0
Mature males	0	431	0	0	0	0	0	425	786	1,416	166
Legal	0	431	0	0	0	0	0	425	786	1,416	166
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	71	746
Total weight (kg)	0.00	32.44	0.00	0.00	0.00	0.00	0.00	23.90	41.88	65.74	22.04
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	75	72	834	6,164	1,621	3,928	1,280	4,882	1,500	1,133	13,681
Mature males	224	503	64	242	312	720	2,240	1,627	1,785	1,345	2,405
Legal	150	431	0	181	249	327	1,792	1,203	1,285	920	1,410
Immature females	75	72	449	1,269	561	2,423	256	3,962	500	212	2,736
Mature females	0	0	128	483	5,361	2,095	768	354	286	496	663
Total weight (kg)	2.35	5.49	1.89	12.31	20.47	17.02	27.15	25.64	27.82	19.81	58.36
Opilio Tanner Crab											
Immature males	0	0	0	0	0	196	64	71	71	0	0
Mature males	0	0	0	0	0	0	960	71	0	0	0
Legal	0	0	0	0	0	65	1,024	71	71	0	0
Immature females	0	0	0	0	0	131	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.37	9.21	0.87	0.22	0.00	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	0	0	0	0	0	0	64	142	0	0	0
Immature females	0	0	0	0	125	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.01	0.00	0.44	0.92	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	C-18	D-01	D-02	D-03	D-04	D-05	D-06	D-07	D-08	D-09	D-10
Start Date	06/30/2015	06/22/2015	06/22/2015	06/16/2015	06/16/2015	06/12/2015	06/12/2015	06/12/2015	06/08/2015	06/07/2015	06/08/2015
Duration (hour)	0.52	0.53	0.52	0.53	0.52	0.52	0.52	0.52	0.5	0.51	0.52
Distance Fished (km)	2.87	2.95	2.88	2.95	2.83	2.99	3	2.83	2.74	2.75	2.92
Mid-Latitude (ºN)	55.67	56.01	56	55.99	56.02	56	56.01	56	56.01	55.99	55.99
Mid-Longitude (ºW)	-168.19	-167.62	-167	-166.39	-165.78	-165.17	-164.58	-164.04	-163.39	-162.82	-162.25
Bottom Depth (m)	136	133	135	124	105	97	93	90	88	78	70
Bottom Temperature (ºC)	4.9	5	5.1	5.1	4.9	4.5	4.7	4.6	4.3	4.2	4.7
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	154	71
Mature males	0	0	0	0	0	0	66	144	809	694	994
Legal	0	0	0	0	0	0	66	144	515	617	923
Immature females	0	0	0	0	0	0	0	0	0	77	0
Mature females	0	0	0	0	0	0	0	0	0	3,625	71
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	3.55	6.48	27.52	84.45	49.13
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	1,435	1,236	1,075	557	1,476	3,710	726	431	5,591	1,003	426
Mature males	0	371	179	681	1,968	3,575	2,573	2,296	1,986	771	497
Legal	0	185	179	309	1,757	2,698	1,781	1,650	1,545	386	426
Immature females	1,981	1,545	299	309	633	4,183	396	0	3,164	231	0
Mature females	137	742	418	619	6,326	14,578	7,389	72	3,899	0	71
Total weight (kg)	1.16	7.78	4.09	8.49	40.71	78.81	52.61	29.70	36.09	9.77	6.72
Opilio Tanner Crab											
Immature males	0	556	119	0	281	472	132	0	0	0	0
Mature males	68	803	358	248	914	540	0	0	0	0	0
Legal	68	1,298	478	248	1,125	944	132	0	0	0	0
Immature females	0	0	60	0	0	0	0	0	0	0	0
Mature females	0	12,915	4,362	2,599	29,521	135	0	0	0	0	0
Total weight (kg)	1.02	38.50	13.75	8.30	64.61	7.05	0.55	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	67	66	0	0	0	0
Males ≥ 78 mm	0	0	0	124	0	202	0	215	0	0	71
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	124	60	0	422	270	0	0	0	0	0
Total weight (kg)	0.00	0.29	0.11	1.09	0.85	2.51	0.24	1.98	0.00	0.00	0.37

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	D-18	E-01	E-02	E-03	E-04	E-05	E-06	E-07	E-08	E-09	E-10
Start Date	06/30/2015	06/22/2015	06/22/2015	06/16/2015	06/16/2015	06/13/2015	06/13/2015	06/12/2015	06/08/2015	06/07/2015	06/07/2015
Duration (hour)	0.53	0.55	0.54	0.51	0.53	0.52	0.51	0.5	0.27	0.51	0.42
Distance Fished (km)	3	2.94	2.94	2.88	2.9	2.85	2.78	2.74	1.44	2.77	2.37
Mid-Latitude (ºN)	55.99	56.34	56.33	56.32	56.33	56.34	56.33	56.34	56.33	56.33	56.34
Mid-Longitude (ºW)	-168.23	-167.65	-167.04	-166.44	-165.8	-165.19	-164.58	-163.97	-163.42	-162.79	-162.19
Bottom Depth (m)	149	129	113	104	91	87	88	84	85	79	78
Bottom Temperature (ºC)	4.6	5.1	5	4.8	4.3	4.6	4.4	4	3.6	4.2	4.4
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	79	0
Mature males	0	0	0	0	0	0	0	290	0	476	659
Legal	0	0	0	0	0	0	0	290	0	238	471
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	159	2,260
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.73	0.00	16.52	52.76
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	970	960	254	1,008	1,318	3,579	5,193	1,305	1,583	476	377
Mature males	139	832	890	1,478	1,110	3,860	1,298	2,175	2,303	2,221	848
Legal	139	704	763	1,276	902	2,527	865	1,667	1,727	1,587	471
Immature females	416	704	445	873	902	842	4,832	652	288	159	0
Mature females	277	192	3,305	3,426	555	16,296	2,596	4,639	288	555	283
Total weight (kg)	3.29	9.34	18.11	22.71	15.96	91.47	24.18	33.94	14.67	23.83	8.73
Opilio Tanner Crab											
Immature males	2,010	1,919	572	336	555	351	433	0	0	0	0
Mature males	1,732	4,222	636	403	69	491	433	72	0	79	0
Legal	3,257	5,694	1,080	672	208	702	649	72	0	79	0
Immature females	0	64	0	0	208	0	72	0	0	0	0
Mature females	28,896	3,583	59,675	134	69	2,246	72	0	0	0	0
Total weight (kg)	55.95	50.24	122.82	6.07	1.31	8.64	4.35	0.45	0.00	0.74	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	67	0	70	72	0	0	0	0
Males ≥ 78 mm	139	512	0	67	0	140	288	72	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	69	192	191	0	0	912	0	290	0	0	0
Total weight (kg)	0.96	4.70	0.51	0.95	0.00	4.25	1.98	1.14	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	E-11	E-12	E-18	E-19	E-20	E-21	E-22	F-01	F-02	F-03	F-04
Start Date	06/04/2015	06/04/2015	06/29/2015	06/30/2015	06/30/2015	06/30/2015	07/01/2015	06/23/2015	06/23/2015	06/16/2015	06/16/2015
Duration (hour)	0.53	0.51	0.3	0.51	0.27	0.51	0.5	0.54	0.52	0.51	0.53
Distance Fished (km)	2.98	2.79	1.64	2.84	1.52	2.82	2.83	2.9	2.87	2.93	2.91
Mid-Latitude (ºN)	56.33	56.33	56.33	56.34	56.36	56.34	56.35	56.67	56.65	56.67	56.68
Mid-Longitude (ºW)	-161.63	-161	-168.25	-168.89	-169.47	-170.07	-170.68	-167.67	-167.07	-166.44	-165.85
Bottom Depth (m)	63	52	154	128	136	110	120	104	96	85	78
Bottom Temperature (ºC)	4.8	5.3	4.4	4.9	4.7	4.6	4.6	4.2	4.1	4	4
Red King Crab											
Immature males	713	0	0	0	0	0	0	0	0	0	0
Mature males	2,925	635	0	0	0	0	0	0	0	0	0
Legal	2,140	555	0	0	0	0	0	0	0	0	0
Immature females	71	0	0	0	0	0	0	0	0	0	0
Mature females	8,845	3,650	0	0	0	0	0	0	0	0	0
Total weight (kg)	280.85	92.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males											
Mature males	428	635	864	146	1,077	2,194	1,454	858	2,085	796	3,860
Legal	713	1,190	1,975	364	0	399	277	2,639	1,749	398	286
Immature females	571	1,031	1,481	364	0	133	208	2,243	1,547	332	143
Mature females	0	0	247	0	2,423	199	1,454	462	2,378	199	1,787
Total weight (kg)	214	0	1,481	3,276	0	1,064	69	396	6,854	133	1,358
	8.74	11.73	11.45	10.44	0.15	10.13	5.21	26.43	38.58	5.31	11.42
Opilio Tanner Crab											
Immature males	0	0	3,949	874	0	66	0	4,881	1,547	66	429
Mature males	0	0	1,604	582	0	0	0	6,596	605	398	143
Legal	0	0	4,196	946	0	0	0	10,290	740	398	357
Immature females	0	0	0	0	0	332	0	0	202	0	0
Mature females	0	0	105,644	41,715	0	0	0	528	1,412	0	429
Total weight (kg)	0.00	0.00	98.74	71.33	0.00	0.22	0.00	70.44	8.10	3.97	3.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	73	0	66	0	66	0	0	71
Males ≥ 78 mm	0	0	740	218	0	0	0	396	0	66	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	494	728	0	0	0	66	135	0	0
Total weight (kg)	0.00	0.00	3.02	3.15	0.00	0.06	0.00	3.31	0.29	0.45	0.19

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	F-05	F-06	F-07	F-08	F-09	F-10	F-11	F-12	F-13	F-14	F-18
Start Date	06/13/2015	06/13/2015	06/12/2015	06/08/2015	06/07/2015	06/07/2015	06/05/2015	06/04/2015	06/04/2015	06/04/2015	06/29/2015
Duration (hour)	0.51	0.53	0.51	0.52	0.53	0.5	0.27	0.52	0.52	0.51	0.51
Distance Fished (km)	2.95	2.87	2.78	2.83	2.99	2.76	1.43	2.8	2.8	2.77	2.85
Mid-Latitude (ºN)	56.66	56.67	56.66	56.67	56.66	56.67	56.67	56.66	56.67	56.67	56.66
Mid-Longitude (ºW)	-165.22	-164.59	-164.02	-163.37	-162.77	-162.18	-161.6	-161	-160.38	-159.76	-168.28
Bottom Depth (m)	76	75	75	75	73	71	88	68	61	38	107
Bottom Temperature (ºC)	4	3.9	3.5	4.1	4.3	4.4	4.3	4.5	4.7	5.5	4.7
Red King Crab											
Immature males	0	0	0	71	0	1,301	150	5,386	79	0	0
Mature males	0	0	0	921	551	1,788	300	1,214	236	0	0
Legal	0	0	0	921	413	975	300	834	157	0	0
Immature females	0	0	0	0	0	0	0	3,717	0	0	0
Mature females	0	0	0	0	0	406	150	7,206	1,257	175	0
Total weight (kg)	0.00	0.00	0.00	42.33	23.17	72.14	9.28	209.99	23.97	2.24	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	1,082	1,905	748	2,692	207	244	600	228	314	2,280	478
Mature males	649	1,270	408	1,629	413	894	6,597	3,034	864	263	2,596
Legal	216	988	272	1,063	207	406	5,698	2,731	786	175	2,322
Immature females	577	635	204	779	0	0	0	0	0	702	0
Mature females	144	353	0	496	0	0	150	0	0	0	615
Total weight (kg)	9.24	18.39	5.72	18.96	5.12	7.38	38.49	34.90	7.81	7.62	24.40
Opilio Tanner Crab											
Immature males	0	0	0	71	0	0	0	0	0	0	2,186
Mature males	289	141	0	142	0	0	150	0	0	0	751
Legal	289	141	0	142	0	0	150	0	0	0	1,981
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	141,185
Total weight (kg)	2.19	1.16	0.00	1.23	0.00	0.00	0.52	0.00	0.00	0.00	185.45
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	68
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	410
Immature females	0	0	0	0	0	0	0	0	0	0	68
Mature females	0	0	0	0	0	0	0	0	0	0	751
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.55

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	F-19	F-20	F-21	F-22	F-23	F-24	F-25	G-01	G-02	G-03	G-04
Start Date	06/29/2015	06/29/2015	06/30/2015	07/01/2015	07/02/2015	07/29/2015	07/29/2015	06/23/2015	06/23/2015	06/16/2015	06/16/2015
Duration (hour)	0.51	0.53	0.54	0.53	0.51	0.51	0.5	0.52	0.53	0.53	0.51
Distance Fished (km)	2.87	2.96	3.08	2.81	2.77	2.84	2.69	2.87	2.93	2.96	2.82
Mid-Latitude (ºN)	56.67	56.67	56.67	56.66	56.67	56.67	56.68	57	56.99	57.01	57
Mid-Longitude (ºW)	-168.91	-169.5	-170.13	-170.74	-171.36	-171.98	-172.57	-167.7	-167.09	-166.45	-165.86
Bottom Depth (m)	99	80	97	113	120	126	134	78	74	75	72
Bottom Temperature (ºC)	3.7	5.5	5.2	4.6	4.4	4.6	4.6	3.5	3.5	3.7	3.8
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	2,268	270	2,023	3,326	2,265	1,103	2,064	487	421	273	442
Mature males	3,332	541	522	1,203	142	74	0	557	632	683	442
Legal	2,410	541	392	991	71	74	0	418	351	615	147
Immature females	0	68	1,436	3,539	2,619	441	1,349	139	211	0	0
Mature females	15,298	0	522	212	496	0	635	0	0	0	0
Total weight (kg)	58.97	5.90	11.66	14.11	2.48	1.40	1.94	5.32	5.39	6.64	4.97
Opilio Tanner Crab											
Immature males	4,891	0	65	0	1,416	0	0	1,114	140	137	0
Mature males	3,686	0	0	0	708	0	0	557	70	68	294
Legal	6,167	0	0	0	1,345	0	0	1,392	140	137	294
Immature females	0	0	0	0	0	0	0	0	70	0	0
Mature females	124,120	68	0	0	21,521	0	0	0	0	0	0
Total weight (kg)	207.57	0.09	0.07	0.00	44.54	0.00	0.00	8.12	1.18	0.85	2.51
Hybrid Tanner Crab											
Males ≤ 77 mm	71	0	392	0	0	0	0	0	0	0	0
Males ≥ 78 mm	1,134	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	4,395	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	14.16	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	G-05	G-06	G-07	G-08	G-09	G-10	G-11	G-12	G-13	G-14	G-15
Start Date	06/13/2015	06/13/2015	06/12/2015	06/08/2015	06/07/2015	06/07/2015	06/05/2015	06/05/2015	06/04/2015	06/03/2015	06/03/2015
Duration (hour)	0.52	0.52	0.5	0.5	0.52	0.51	0.52	0.52	0.51	0.51	0.52
Distance Fished (km)	2.95	2.83	2.72	2.7	2.89	2.82	2.91	2.83	2.87	2.74	2.85
Mid-Latitude (ºN)	57.01	57	57	57	57	57	57	57.01	57	57	56.99
Mid-Longitude (ºW)	-165.23	-164.61	-164.03	-163.39	-162.79	-162.17	-161.54	-160.96	-160.34	-159.72	-159.13
Bottom Depth (m)	70	69	68	66	61	61	69	63	63	55	33
Bottom Temperature (ºC)	3.6	3.3	3.6	4	4.6	4.9	4.6	4.4	4.5	4.8	6.5
Red King Crab											
Immature males	0	0	0	0	223	0	136	443	447	83	0
Mature males	0	0	0	77	669	152	340	1,623	744	166	0
Legal	0	0	0	0	520	152	340	1,180	447	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	76	544	2,582	1,489	1,080	0
Total weight (kg)	0.00	0.00	0.00	2.03	27.49	7.05	22.84	111.21	54.35	20.52	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	1,236	1,227	451	464	520	76	136	295	149	415	768
Mature males	275	722	376	619	0	0	204	369	3,424	2,659	85
Legal	206	505	376	387	0	0	136	295	3,349	2,243	85
Immature females	0	72	0	0	0	0	0	0	0	0	0
Mature females	69	72	75	77	0	0	0	0	0	0	85
Total weight (kg)	6.05	12.27	4.47	7.08	1.88	0.44	2.92	5.06	38.81	20.76	3.11
Opilio Tanner Crab											
Immature males	0	72	0	77	74	0	0	0	0	0	0
Mature males	0	72	0	0	0	0	0	0	0	0	0
Legal	0	72	0	77	74	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.35	0.00	0.29	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	69	0	75	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.63	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	G-18	G-19	G-20	G-21	G-22	G-23	G-24	G-25	G-26	GF1918	GF2019
Start Date	06/28/2015	06/28/2015	07/01/2015	07/01/2015	07/02/2015	07/02/2015	07/29/2015	07/29/2015	07/29/2015	06/29/2015	06/29/2015
Duration (hour)	0.52	0.53	0.51	0.52	0.52	0.53	0.35	0.49	0.51	0.51	0.52
Distance Fished (km)	2.74	2.77	2.77	2.88	2.86	2.98	1.89	2.69	2.75	2.92	2.9
Mid-Latitude (ºN)	57	57	57	57	57	57	57	57	57	56.83	56.83
Mid-Longitude (ºW)	-168.34	-168.95	-169.56	-170.16	-170.78	-171.41	-172.05	-172.65	-173.25	-168.62	-169.31
Bottom Depth (m)	80	80	60	68	95	109	117	121	142	96	80
Bottom Temperature (ºC)	3.7	4.2	4.8	5.2	4.9	4.3	4.3	4.5	3.9	3.9	4.4
Red King Crab											
Immature males	0	0	0	445	0	0	0	0	0	0	0
Mature males	0	0	0	10,160	0	0	0	0	0	0	0
Legal	0	0	0	9,640	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	6,971	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	772.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	222	0	0	0	0	0	0	0
Mature males	0	0	83	222	0	0	0	0	0	0	0
Legal	0	0	0	74	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	83	519	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	2.92	15.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	686	1,145	5,220	6,971	9,412	1,543	112	1,307	2,921	2,712	937
Mature males	2,059	6,107	2,817	3,040	3,115	386	112	0	0	11,417	2,378
Legal	1,754	5,038	2,486	1,557	2,302	386	112	0	0	9,419	1,945
Immature females	0	76	2,237	3,930	1,422	2,765	0	1,384	3,359	285	216
Mature females	1,297	76	994	964	1,625	129	0	154	73	3,568	72
Total weight (kg)	19.83	51.89	25.42	36.69	47.58	4.41	0.97	1.44	1.03	105.65	21.56
Opilio Tanner Crab											
Immature males	5,034	1,069	0	74	68	1,929	112	0	0	6,279	1,729
Mature males	8,390	1,145	0	0	135	836	2,128	0	0	5,637	793
Legal	12,127	1,832	0	74	203	2,186	2,240	0	0	8,991	2,017
Immature females	0	0	0	0	271	0	0	0	0	0	0
Mature females	0	0	83	0	745	30,477	0	0	0	83,058	144
Total weight (kg)	72.90	10.58	0.09	0.47	2.49	55.74	11.35	0.00	0.00	166.72	10.83
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	74	1,422	0	0	0	0	143	72
Males ≥ 78 mm	534	76	0	0	68	0	0	0	0	1,784	72
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	64	0	0	0	1,427	0
Total weight (kg)	3.65	0.75	0.00	0.13	3.47	0.12	0.00	0.00	0.00	15.65	0.84

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	GF2120	GF2221	H-01	H-02	H-03	H-04	H-05	H-06	H-07	H-08	H-09
Start Date	06/30/2015	07/01/2015	06/23/2015	06/23/2015	06/15/2015	06/15/2015	06/13/2015	06/13/2015	06/12/2015	06/08/2015	06/06/2015
Duration (hour)	0.52	0.52	0.53	0.51	0.52	0.52	0.51	0.52	0.51	0.5	0.5
Distance Fished (km)	3.01	2.86	2.88	2.79	2.78	2.81	2.81	2.83	2.78	2.72	2.8
Mid-Latitude (ºN)	56.83	56.84	57.33	57.33	57.34	57.34	57.32	57.33	57.33	57.34	57.33
Mid-Longitude (ºW)	-169.91	-170.5	-167.73	-167.12	-166.48	-165.88	-165.22	-164.63	-164.02	-163.38	-162.77
Bottom Depth (m)	73	101	74	70	70	68	67	65	61	53	49
Bottom Temperature (ºC)	5.4	4.7	2.9	3.1	3.4	3.2	3.2	3.5	3.8	4.8	5
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	156
Mature males	69	0	0	0	0	73	0	0	0	0	389
Legal	69	0	0	0	0	73	0	0	0	0	156
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	76	0	0
Total weight (kg)	5.09	0.00	0.00	0.00	0.00	4.94	0.00	0.00	0.92	0.00	13.44
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	1,240	3,066	427	442	380	803	1,024	504	604	235	0
Mature males	5,650	2,926	356	589	836	1,168	1,682	576	1,209	78	156
Legal	5,099	2,717	214	442	608	1,022	1,317	432	1,057	78	0
Immature females	138	2,160	0	0	0	0	0	0	0	0	0
Mature females	276	627	142	0	0	0	73	0	0	0	0
Total weight (kg)	59.55	34.51	4.11	4.19	6.30	12.42	18.07	6.85	11.56	2.01	0.93
Opilio Tanner Crab											
Immature males	345	0	997	368	684	73	0	0	0	0	0
Mature males	276	0	356	516	1,977	1,314	293	144	0	0	0
Legal	551	0	926	737	2,281	1,314	293	144	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	2.96	0.00	4.79	6.12	15.93	9.98	2.20	1.43	0.00	0.00	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	70	0	0	0	0	73	0	76	0	0
Males ≥ 78 mm	207	0	0	0	1,065	219	73	0	0	0	0
Immature females	0	70	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	1.94	0.04	0.00	0.00	8.77	1.74	0.88	0.00	0.24	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	H-10	H-11	H-12	H-13	H-14	H-15	H-16	H-18	H-19	H-20	H-21
Start Date	06/07/2015	06/05/2015	06/05/2015	06/04/2015	06/03/2015	06/03/2015	06/02/2015	06/28/2015	06/28/2015	07/01/2015	07/04/2015
Duration (hour)	0.5	0.48	0.54	0.5	0.51	0.51	0.52	0.53	0.53	0.52	0.51
Distance Fished (km)	2.78	2.69	2.9	2.75	2.85	2.83	2.82	2.9	2.93	2.81	2.81
Mid-Latitude (ºN)	57.33	57.33	57.34	57.34	57.33	57.33	57.34	57.33	57.33	57.32	57.33
Mid-Longitude (ºW)	-162.16	-161.52	-160.92	-160.3	-159.67	-159.08	-158.4	-168.37	-168.98	-169.6	-170.23
Bottom Depth (m)	51	58	66	62	55	49	32	73	69	61	55
Bottom Temperature (ºC)	5.3	4.9	4.2	4.5	4.8	5	5.8	3.3	4	3.8	6.5
Red King Crab											
Immature males	1,385	300	346	154	239	0	0	0	0	81	0
Mature males	1,154	375	1,038	0	398	0	0	0	0	81	0
Legal	769	225	969	0	159	0	0	0	0	81	0
Immature females	308	0	208	0	0	0	0	0	0	0	0
Mature females	462	525	3,945	540	398	475	0	0	0	0	0
Total weight (kg)	67.09	26.63	123.91	10.22	19.29	6.73	0.00	0.00	0.00	6.37	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	139	81	0
Legal	0	0	0	0	0	0	0	0	139	81	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	139	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.18	1.96	0.00
Bairdi Tanner Crab											
Immature males	385	75	277	154	558	475	608	281	279	725	542
Mature males	385	75	484	154	2,867	950	87	141	209	10,713	155
Legal	154	75	415	154	2,628	713	87	141	70	8,860	155
Immature females	0	0	0	77	0	0	0	0	0	0	0
Mature females	0	0	0	154	159	0	87	70	139	564	0
Total weight (kg)	4.55	1.08	6.11	3.22	30.27	7.98	2.34	2.73	2.46	71.47	2.85
Opilio Tanner Crab											
Immature males	0	0	0	0	0	0	0	211	0	322	0
Mature males	0	0	0	0	0	0	0	70	0	161	0
Legal	0	0	0	0	0	0	0	70	0	322	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	70	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.00	1.62	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	H-22	H-23	H-24	H-25	H-26	HG1918	HG2019	HG2120	HG2221	I-01	I-02
Start Date	07/08/2015	07/13/2015	07/29/2015	07/28/2015	07/28/2015	06/28/2015	07/01/2015	06/30/2015	07/04/2015	06/23/2015	06/23/2015
Duration (hour)	0.5	0.52	0.52	0.5	0.49	0.52	0.5	0.53	0.51	0.51	0.52
Distance Fished (km)	2.72	2.77	2.83	2.68	2.65	2.82	2.7	3.08	2.84	2.82	2.8
Mid-Latitude (ºN)	57.34	57.33	57.34	57.35	57.33	57.17	57.17	57.15	57.12	57.67	57.67
Mid-Longitude (ºW)	-170.86	-171.47	-172.1	-172.81	-173.33	-168.64	-169.32	-169.9	-170.46	-167.76	-167.12
Bottom Depth (m)	83	102	109	117	121	76	72	50	51	69	68
Bottom Temperature (ºC)	5.1	4.5	3.9	4.5	4.6	3.9	4.5	6.2	6.2	3.3	3
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	173	72	954	0	0
Legal	0	0	0	0	0	0	173	72	807	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	72	294	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	12.43	3.09	41.70	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	87	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	87	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	2.02	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	282	1,205	207	228	0	300	4,178	1,645	3,302	303	1,359
Mature males	2,749	1,771	275	0	0	824	15,011	501	954	4,236	11,688
Legal	2,538	1,417	275	0	0	599	11,607	358	440	3,631	10,737
Immature females	0	354	0	0	79	0	0	644	1,101	0	0
Mature females	564	71	0	0	79	0	0	0	0	0	0
Total weight (kg)	29.83	15.82	3.01	0.03	0.20	7.17	113.80	8.75	11.84	29.83	97.07
Opilio Tanner Crab											
Immature males	0	2,055	3,167	0	79	75	2,165	0	0	1,362	2,755
Mature males	0	3,118	9,018	0	79	75	3,032	72	0	303	5,727
Legal	0	4,676	11,703	0	79	150	4,504	72	0	756	6,887
Immature females	0	0	0	0	0	0	0	0	0	151	72
Mature females	0	213	0	381	0	75	0	0	0	0	0
Total weight (kg)	0.00	28.60	68.23	0.34	0.30	0.65	23.02	0.61	0.00	4.85	47.04
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	220	0	72
Males ≥ 78 mm	141	283	275	0	0	0	520	0	0	151	145
Immature females	0	0	0	0	0	0	0	0	147	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.74	2.36	3.01	0.00	0.00	0.00	2.72	0.00	0.40	0.84	0.93

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	I-03	I-04	I-05	I-06	I-07	I-08	I-09	I-10	I-11	I-12	I-13
Start Date	06/15/2015	06/15/2015	06/13/2015	06/13/2015	06/12/2015	06/09/2015	06/06/2015	06/07/2015	06/05/2015	06/05/2015	06/04/2015
Duration (hour)	0.51	0.53	0.52	0.52	0.51	0.5	0.5	0.52	0.49	0.53	0.53
Distance Fished (km)	2.84	2.87	2.95	2.83	2.76	2.82	2.82	2.8	2.63	2.91	2.97
Mid-Latitude (ºN)	57.67	57.66	57.67	57.66	57.67	57.66	57.66	57.66	57.66	57.67	57.67
Mid-Longitude (ºW)	-166.51	-165.89	-165.25	-164.61	-164	-163.37	-162.74	-162.14	-161.48	-160.88	-160.24
Bottom Depth (m)	66	64	61	53	51	46	43	47	53	57	55
Bottom Temperature (ºC)	2.9	3	3	4.1	4.5	4.9	5.2	5.3	3.9	3.3	4.6
Red King Crab											
Immature males	0	0	0	0	0	0	77	78	230	506	143
Mature males	0	0	0	0	78	0	77	545	537	1,373	499
Legal	0	0	0	0	0	0	77	545	461	867	285
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	79	155	0	230	78	307	1,156	285
Total weight (kg)	0.00	0.00	0.00	1.11	4.61	0.00	7.48	20.47	23.96	72.83	24.46
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	73	869	776	472	1,009	234	153	0	154	361	214
Mature males	3,930	2,099	705	945	2,717	389	77	311	307	361	356
Legal	3,712	1,592	705	866	2,252	234	77	156	230	217	214
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	29.53	20.53	9.57	8.24	24.80	3.63	1.14	2.25	2.82	4.89	4.08
Opilio Tanner Crab											
Immature males	873	434	212	79	0	0	0	0	0	0	0
Mature males	14,701	11,654	353	0	233	0	0	0	0	0	0
Legal	15,356	11,871	494	0	233	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	106.43	93.99	2.85	0.21	1.39	0.00	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	1,164	941	282	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	8.11	7.27	2.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	I-14	I-15	I-16	I-18	I-19	I-20	I-21	I-22	I-23	I-24	I-25
Start Date	06/03/2015	06/03/2015	06/02/2015	06/28/2015	06/27/2015	07/03/2015	07/04/2015	07/08/2015	07/08/2015	07/13/2015	07/28/2015
Duration (hour)	0.52	0.5	0.52	0.51	0.54	0.51	0.51	0.51	0.5	0.53	0.5
Distance Fished (km)	2.86	2.78	2.85	2.77	3.05	2.77	2.92	2.8	2.82	2.92	2.75
Mid-Latitude (ºN)	57.65	57.67	57.67	57.65	57.67	57.66	57.67	57.67	57.67	57.67	57.67
Mid-Longitude (ºW)	-159.63	-159.01	-158.36	-168.39	-169.04	-169.64	-170.28	-170.9	-171.53	-172.18	-172.8
Bottom Depth (m)	50	49	36	70	69	71	72	86	100	107	119
Bottom Temperature (ºC)	4.6	5.1	5.8	2.7	2.7	3.9	3.5	3.9	2.3	3.3	4.3
Red King Crab											
Immature males	638	0	0	0	0	0	0	0	0	0	0
Mature males	797	0	0	0	0	0	68	0	0	0	0
Legal	558	0	0	0	0	0	68	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	1,276	0	0	0	0	0	68	0	0	0	0
Total weight (kg)	56.12	0.00	0.00	0.00	0.00	0.00	5.47	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	239	148	83	150	674	625	479	70	1,188	69	0
Mature males	957	74	0	601	135	859	1,096	422	3,102	69	0
Legal	957	74	0	526	135	781	1,027	281	2,640	69	0
Immature females	0	0	0	0	0	0	0	0	1,584	275	0
Mature females	0	0	0	0	0	0	0	211	1,452	207	0
Total weight (kg)	10.26	1.20	0.31	4.69	3.12	8.32	10.57	3.92	35.33	1.02	0.00
Opilio Tanner Crab											
Immature males	0	0	0	376	6,070	391	205	351	1,452	3,650	1,008
Mature males	0	0	0	0	67	234	0	0	462	2,066	288
Legal	0	0	0	226	674	312	68	211	990	4,132	648
Immature females	0	0	0	150	67	0	0	0	0	0	0
Mature females	0	0	0	0	37,771	78	0	492	264	23,348	49,051
Total weight (kg)	0.00	0.00	0.00	1.04	46.94	2.60	0.50	1.80	7.23	54.15	48.57
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	156	0	0	132	0	0
Males ≥ 78 mm	0	0	0	0	0	78	0	70	132	0	72
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	70	66	69	72
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.54	1.36	0.13	0.98

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	I-26	IH1918	IH2019	IH2120	IH2221	J-01	J-02	J-03	J-04	J-05	J-06
Start Date	07/23/2015	06/28/2015	07/03/2015	07/04/2015	07/08/2015	06/24/2015	06/23/2015	06/15/2015	06/15/2015	06/14/2015	06/14/2015
Duration (hour)	0.52	0.53	0.51	0.5	0.52	0.52	0.52	0.51	0.51	0.52	0.52
Distance Fished (km)	2.89	2.97	2.75	2.65	2.93	2.85	2.77	2.96	2.79	2.94	2.86
Mid-Latitude (ºN)	57.66	57.5	57.5	57.49	57.51	57.99	58	58.01	58	58.01	58
Mid-Longitude (ºW)	-173.38	-168.74	-169.38	-170	-170.59	-167.8	-167.17	-166.52	-165.91	-165.24	-164.6
Bottom Depth (m)	144	71	71	67	75	67	64	61	55	50	46
Bottom Temperature (ºC)	4.1	3	4.1	4.3	4.8	2.9	3	3.1	3.7	4.5	4.8
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	1,902	975	0	0	71	0	0	0
Legal	0	0	0	1,598	975	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	80	0	0
Total weight (kg)	0.00	0.00	0.00	82.54	56.62	0.00	0.00	2.20	0.97	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	68	77	76	209	0	0	0	0	0	0
Legal	0	0	0	76	139	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	1.71	1.76	3.21	8.52	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	198	205	1,923	989	841	1,103	517	1,630	954	893	228
Mature males	132	0	3,000	6,773	11,351	4,117	1,331	1,488	795	447	455
Legal	132	0	2,308	5,403	10,651	3,308	961	992	318	447	379
Immature females	66	0	0	0	139	0	0	0	0	0	0
Mature females	0	0	231	380	3,204	0	0	0	0	0	0
Total weight (kg)	1.54	0.73	28.11	47.53	117.30	29.66	9.34	13.38	7.42	6.98	4.45
Opilio Tanner Crab											
Immature males	0	409	77	837	279	2,646	739	2,126	477	149	0
Mature males	0	0	154	685	348	956	2,218	3,402	954	0	76
Legal	0	136	231	1,218	418	2,058	2,513	4,890	1,273	0	76
Immature females	0	68	0	0	70	294	0	142	80	0	0
Mature females	0	136	0	0	139	221	0	0	0	0	0
Total weight (kg)	0.00	1.52	1.23	4.90	3.80	12.46	15.64	24.38	6.24	0.30	0.41
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	761	70	0	0	213	0	0	0
Males ≥ 78 mm	0	0	77	1,902	209	0	0	850	159	74	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	139	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.59	11.45	2.01	0.00	0.00	4.66	0.50	0.29	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	J-07	J-08	J-09	J-10	J-11	J-12	J-13	J-14	J-15	J-16	J-18
Start Date	06/11/2015	06/09/2015	06/06/2015	06/06/2015	06/05/2015	06/05/2015	06/04/2015	06/03/2015	06/03/2015	06/02/2015	06/28/2015
Duration (hour)	0.51	0.52	0.52	0.5	0.53	0.52	0.51	0.53	0.52	0.52	0.54
Distance Fished (km)	2.89	2.81	2.95	2.67	2.82	2.91	2.78	2.91	2.87	2.82	2.94
Mid-Latitude (ºN)	58	58	58.01	58	57.99	58	58	57.99	58.01	58	57.98
Mid-Longitude (ºW)	-163.99	-163.39	-162.74	-162.12	-161.45	-160.84	-160.21	-159.59	-158.98	-158.35	-168.42
Bottom Depth (m)	47	43	42	37	54	45	51	41	42	33	69
Bottom Temperature (ºC)	5.2	5.2	4.8	4.3	4.2	3.8	4.4	5.3	5.6	6	2.6
Red King Crab											
Immature males	72	0	0	259	75	362	80	0	605	685	0
Mature males	0	0	0	346	300	362	0	80	0	0	0
Legal	0	0	0	86	150	145	0	80	0	0	0
Immature females	0	0	0	86	0	0	0	0	529	942	0
Mature females	0	0	0	173	225	217	0	160	151	0	0
Total weight (kg)	1.10	0.00	0.00	11.70	13.08	18.03	1.29	5.94	5.65	3.89	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	217	0	0	346	599	1,447	478	561	0	0	1,514
Mature males	797	467	74	259	150	2,459	80	160	0	0	1,652
Legal	724	311	74	259	75	1,881	0	80	0	0	964
Immature females	0	0	0	0	0	0	80	0	0	0	0
Mature females	0	0	0	86	75	579	0	80	0	0	0
Total weight (kg)	8.34	3.78	0.39	3.45	3.37	29.32	2.53	3.53	0.00	0.00	17.45
Opilio Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	7,022
Mature males	0	0	0	86	0	0	0	0	0	0	413
Legal	0	0	0	86	0	0	0	0	0	0	2,203
Immature females	0	0	0	0	0	0	0	0	0	0	482
Mature females	0	0	0	0	0	0	0	0	0	0	895
Total weight (kg)	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	17.24
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	138
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	69
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	J-19	J-20	J-21	J-22	J-23	J-24	J-25	J-26	JI1918	JI2019	JI2120
Start Date	06/27/2015	07/03/2015	07/05/2015	07/08/2015	07/08/2015	07/13/2015	07/28/2015	07/23/2015	06/27/2015	06/27/2015	07/05/2015
Duration (hour)	0.51	0.5	0.52	0.52	0.51	0.51	0.52	0.51	0.52	0.53	0.52
Distance Fished (km)	2.78	2.76	2.88	2.76	2.88	2.8	2.89	2.72	2.91	2.81	2.89
Mid-Latitude (ºN)	58	58	57.99	57.99	58	58	58	58	57.83	57.84	57.84
Mid-Longitude (ºW)	-169.08	-169.71	-170.32	-170.98	-171.6	-172.24	-172.86	-173.49	-168.73	-169.37	-170
Bottom Depth (m)	70	70	75	87	98	104	109	118	70	66	73
Bottom Temperature (ºC)	2.5	2.6	2.9	2.6	1.3	1.9	2.7	4.4	2.6	3.6	3.4
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	69	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	1,532	526	4,011	825	450	641	68	218	346	444	270
Mature males	3,939	676	6,866	675	64	0	0	0	693	444	472
Legal	3,356	376	4,487	525	64	0	0	0	416	148	270
Immature females	73	0	0	375	257	641	68	3,352	0	0	0
Mature females	73	0	68	600	257	71	0	0	0	0	67
Total weight (kg)	29.56	5.86	53.68	6.78	2.17	0.76	0.01	0.32	5.73	4.14	4.95
Opilio Tanner Crab											
Immature males	5,325	75	1,428	1,125	1,543	285	3,932	2,610	4,848	1,258	337
Mature males	729	150	204	225	965	498	2,847	870	554	148	67
Legal	3,210	225	544	450	2,058	498	4,067	2,103	1,731	296	337
Immature females	73	0	0	75	0	0	0	0	0	0	0
Mature females	2,042	0	1,224	1,650	1,157	356	66,838	326,265	1,247	1,406	0
Total weight (kg)	17.72	1.44	5.27	4.86	12.77	5.61	109.03	209.28	14.79	4.43	1.74
Hybrid Tanner Crab											
Males ≤ 77 mm	292	0	1,088	75	322	0	0	0	69	0	0
Males ≥ 78 mm	1,313	0	816	75	129	0	0	0	139	0	67
Immature females	0	0	68	0	0	0	0	0	0	0	0
Mature females	0	0	204	225	64	0	68	0	0	0	0
Total weight (kg)	6.59	0.00	7.54	0.98	1.62	0.00	0.15	0.00	1.01	0.00	0.29

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	JI2221	K-01	K-02	K-03	K-04	K-05	K-06	K-07	K-08	K-09	K-10
Start Date	07/08/2015	06/24/2015	06/24/2015	06/15/2015	06/15/2015	06/14/2015	06/14/2015	06/11/2015	06/09/2015	06/06/2015	06/06/2015
Duration (hour)	0.52	0.52	0.51	0.51	0.52	0.51	0.53	0.49	0.5	0.51	0.49
Distance Fished (km)	2.89	2.98	2.77	2.92	2.9	2.82	2.8	2.67	2.7	2.79	2.75
Mid-Latitude (ºN)	57.83	58.33	58.33	58.34	58.33	58.33	58.33	58.33	58.34	58.33	58.32
Mid-Longitude (ºW)	-170.62	-167.84	-167.19	-166.56	-165.93	-165.28	-164.64	-163.99	-163.36	-162.72	-162.07
Bottom Depth (m)	79	60	52	48	44	46	42	41	37	33	47
Bottom Temperature (ºC)	4	3.1	4.3	3.8	4.2	4.5	4.8	5.1	5	4.8	5
Red King Crab											
Immature males	0	68	0	148	0	154	157	83	88	0	0
Mature males	0	0	0	0	0	154	157	83	0	82	160
Legal	0	0	0	0	0	154	157	0	0	82	160
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	76	231	78	0	0	0	160
Total weight (kg)	0.00	1.18	0.00	2.10	1.34	11.75	9.75	3.48	1.29	1.84	7.12
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	1,455	68	79	371	76	846	313	249	351	82	401
Mature males	8,247	135	79	74	227	1,614	470	83	176	0	0
Legal	6,168	135	79	74	152	999	235	0	0	0	0
Immature females	139	0	0	0	0	0	0	0	0	82	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	59.60	0.84	0.81	1.49	1.81	14.14	4.09	1.46	2.01	0.47	1.39
Opilio Tanner Crab											
Immature males	1,039	3,994	0	297	0	0	0	0	0	0	0
Mature males	277	135	157	593	0	0	0	0	0	0	0
Legal	693	542	157	741	0	0	0	0	0	0	0
Immature females	0	3,655	79	0	0	0	0	0	0	0	0
Mature females	208	677	0	0	0	0	0	0	0	0	0
Total weight (kg)	4.08	6.88	0.81	3.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	69	68	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	139	0	0	148	76	231	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	1.06	0.11	0.00	0.62	0.37	1.25	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	K-11	K-12	K-13	K-14	K-18	K-19	K-20	K-21	K-22	K-23	K-24
Start Date	06/06/2015	06/06/2015	06/04/2015	06/03/2015	06/27/2015	06/26/2015	07/03/2015	07/05/2015	07/07/2015	07/08/2015	07/13/2015
Duration (hour)	0.52	0.28	0.5	0.53	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Distance Fished (km)	2.93	1.54	2.79	2.98	2.85	2.91	2.82	2.86	2.82	2.81	2.79
Mid-Latitude (ºN)	58.22	58.32	58.28	58.34	58.34	58.34	58.33	58.33	58.33	58.33	58.34
Mid-Longitude (ºW)	-161.55	-160.77	-159.98	-159.57	-168.46	-169.12	-169.74	-170.39	-170.97	-171.64	-172.3
Bottom Depth (m)	41	24	41	26	65	68	69	74	83	96	103
Bottom Temperature (ºC)	5	6.6	4.7	5.2	2.3	1.7	1.6	0.5	1.2	0.6	1.1
Red King Crab											
Immature males	147	0	0	0	0	0	0	0	0	0	0
Mature males	147	0	80	0	0	0	0	0	0	0	0
Legal	74	0	80	0	0	0	0	0	0	0	0
Immature females	0	0	160	0	0	0	0	0	0	0	0
Mature females	74	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	7.37	0.00	4.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	74	0	0	0	285	3,329	6,866	68	2,256	66	3,811
Mature males	0	0	0	83	142	624	1,430	341	928	0	71
Legal	0	0	0	83	71	416	572	273	857	0	0
Immature females	0	0	0	0	0	0	501	68	3,799	131	3,317
Mature females	0	0	0	0	0	139	72	0	0	0	282
Total weight (kg)	0.16	0.00	0.00	0.56	1.94	10.36	27.55	2.33	9.37	0.10	2.88
Opilio Tanner Crab											
Immature males	0	0	0	0	3,130	121,982	20,741	15,549	37,128	263	8,469
Mature males	0	0	0	0	1,352	2,288	1,645	1,841	1,928	66	2,258
Legal	0	0	0	0	2,703	5,617	9,941	5,592	6,569	197	5,717
Immature females	0	0	0	0	71	87,447	715	30,961	72,185	66	353
Mature females	0	0	0	0	0	18,932	5,579	43,850	174,714	263	145,672
Total weight (kg)	0.00	0.00	0.00	0.00	14.43	182.14	59.92	89.87	259.34	1.29	183.57
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	416	930	1,978	0	0	212
Males ≥ 78 mm	0	0	0	0	0	416	286	1,228	0	0	141
Immature females	0	0	0	0	0	0	72	614	0	0	212
Mature females	0	0	0	0	0	0	143	955	3,784	0	71
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	2.97	3.91	9.26	3.30	0.00	0.84

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	K-25	K-26	K-27	L-01	L-02	L-03	L-04	L-05	L-06	L-07	L-08
Start Date	07/13/2015	07/26/2015	07/24/2015	06/24/2015	06/24/2015	06/15/2015	06/15/2015	06/14/2015	06/14/2015	06/11/2015	06/09/2015
Duration (hour)	0.53	0.51	0.52	0.52	0.53	0.52	0.52	0.53	0.51	0.51	0.51
Distance Fished (km)	2.99	2.8	2.78	2.88	2.9	2.85	2.87	2.81	2.79	2.72	2.71
Mid-Latitude (ºN)	58.33	58.33	58.34	58.67	58.67	58.66	58.67	58.68	58.66	58.68	58.67
Mid-Longitude (ºW)	-172.93	-173.57	-174.3	-167.86	-167.22	-166.55	-165.92	-165.31	-164.65	-164	-163.35
Bottom Depth (m)	110	115	162	47	44	42	37	39	36	34	32
Bottom Temperature (ºC)	3	3.6	3.7	3.6	4.1	3.7	4.8	5.2	5	4.9	4.7
Red King Crab											
Immature males	0	0	0	0	0	149	157	153	0	0	0
Mature males	0	0	0	72	0	224	78	153	0	83	0
Legal	0	0	0	72	0	75	78	76	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	69	75	0	76	0	0	90
Total weight (kg)	0.00	0.00	0.00	2.12	0.93	7.78	4.26	8.26	0.00	1.57	1.19
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	65	138	2,656	0	0	75	0	229	168	83	90
Mature males	0	0	0	0	0	0	0	76	84	0	0
Legal	0	0	0	0	0	0	0	0	84	0	0
Immature females	0	0	2,247	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.01	0.04	0.37	0.00	0.00	0.22	0.00	0.92	0.82	0.23	0.22
Opilio Tanner Crab											
Immature males	2,794	4,912	68	0	0	0	0	0	0	0	0
Mature males	1,560	1,315	0	0	0	0	0	0	0	0	0
Legal	2,859	3,321	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	19,364	167,849	68	0	0	0	0	0	0	0	0
Total weight (kg)	38.92	160.17	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	130	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	65	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	68	0	0	0	0	0	0	0	0
Total weight (kg)	0.46	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	L-09	L-18	L-19	L-20	L-21	L-22	L-23	L-24	L-25	L-26	L-27
Start Date	06/06/2015	06/27/2015	06/26/2015	07/04/2015	07/05/2015	07/07/2015	07/07/2015	07/07/2015	07/13/2015	07/26/2015	07/24/2015
Duration (hour)	0.53	0.52	0.52	0.53	0.53	0.51	0.51	0.5	0.27	0.52	0.5
Distance Fished (km)	2.81	2.86	2.85	2.87	2.93	2.82	2.82	2.81	1.54	2.92	2.88
Mid-Latitude (ºN)	58.67	58.67	58.68	58.66	58.67	58.67	58.67	58.67	58.67	58.66	58.67
Mid-Longitude (ºW)	-162.71	-168.49	-169.15	-169.78	-170.44	-171.08	-171.72	-172.36	-173.01	-173.63	-174.28
Bottom Depth (m)	21	53	63	67	73	83	93	102	112	126	158
Bottom Temperature (ºC)	4.8	2.8	1	1.2	0.2	-0.1	0	1.4	2.4	3.4	3.7
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	84	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	1.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	73	360	7,938	259	489	132	0	370	66	2,036
Mature males	0	0	0	214	0	70	0	0	123	0	0
Legal	0	0	0	0	0	70	0	0	123	0	0
Immature females	0	0	144	0	0	0	0	133	0	0	2,036
Mature females	0	0	0	0	0	0	0	0	0	594	66
Total weight (kg)	0.00	0.26	0.47	6.30	0.49	1.97	0.12	0.09	0.61	1.82	1.61
Opilio Tanner Crab											
Immature males	0	0	10,012	243,361	41,530	25,524	1,779	66	1,233	6,142	66
Mature males	0	73	360	357	906	3,147	1,054	0	740	660	0
Legal	0	73	864	8,937	5,175	9,580	1,383	66	1,357	4,161	0
Immature females	0	0	4,466	81,644	93,281	28,111	0	66	0	0	66
Mature females	0	0	576	25,523	35,449	70,208	8,037	0	2,714	29,587	0
Total weight (kg)	0.00	0.34	11.47	320.71	145.45	141.99	16.97	0.24	6.41	62.27	0.02
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	144	0	2,717	0	0	266	0	0	66
Males ≥ 78 mm	0	0	0	0	518	420	0	133	0	0	0
Immature females	0	0	0	0	518	0	132	199	0	0	0
Mature females	0	0	0	0	0	140	6,324	66	0	1,717	0
Total weight (kg)	0.00	0.00	0.18	0.00	7.00	2.75	5.44	1.07	0.00	3.55	0.02

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	L-28	L-29	L-30	L-31	M-01	M-02	M-03	M-04	M-05	M-06	M-07
Start Date	07/24/2015	07/25/2015	07/22/2015	07/27/2015	06/24/2015	06/24/2015	06/24/2015	06/24/2015	06/14/2015	06/14/2015	06/11/2015
Duration (hour)	0.52	0.5	0.52	0.5	0.53	0.51	0.51	0.51	0.52	0.53	0.5
Distance Fished (km)	2.85	2.69	2.97	2.84	2.85	2.78	2.86	2.85	2.98	3	2.75
Mid-Latitude (ºN)	58.72	58.67	58.67	58.67	59	59	59	59	59	59	59
Mid-Longitude (ºW)	-174.91	-175.56	-176.19	-176.87	-167.88	-167.23	-166.58	-165.93	-165.31	-164.64	-164
Bottom Depth (m)	160	135	141	136	42	39	34	31	27	27	28
Bottom Temperature (ºC)	3.7	3.6	3.6	3.3	3.6	5.5	5.8	6.5	5.3	5.2	5
Red King Crab											
Immature males	0	0	0	0	0	79	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	146	0	86
Legal	0	0	0	0	0	0	0	0	73	0	86
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	77	78	0	77	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.89	1.16	0.92	4.74	0.82	3.28
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	988	6,453	381	207	148	0	0	0	0	0	0
Mature males	0	3,625	0	0	0	0	0	0	0	0	0
Legal	0	2,175	0	0	0	0	0	0	0	0	0
Immature females	1,185	0	572	207	0	0	0	0	0	0	0
Mature females	0	39,292	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.11	113.04	0.32	0.32	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	66	1,595	0	207	665	0	0	0	0	0	0
Mature males	0	1,088	0	0	0	0	0	0	0	0	0
Legal	66	2,320	0	0	0	0	0	0	0	0	0
Immature females	0	0	191	0	0	0	0	0	0	0	0
Mature females	0	58,076	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.22	61.04	0.03	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	290	127	0	0	0	0	0	0	0	0
Males ≥ 78 mm	0	73	0	0	0	0	0	0	73	0	0
Immature females	0	218	0	0	0	0	0	0	0	0	0
Mature females	0	6,815	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	10.63	0.05	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	M-08	M-18	M-19	M-20	M-21	M-22	M-23	M-24	M-25	M-26	M-27
Start Date	06/09/2015	06/27/2015	06/26/2015	07/04/2015	07/05/2015	07/07/2015	07/07/2015	07/07/2015	07/13/2015	07/26/2015	07/27/2015
Duration (hour)	0.51	0.52	0.53	0.52	0.53	0.51	0.53	0.51	0.28	0.51	0.42
Distance Fished (km)	2.74	2.81	2.92	2.76	2.98	2.77	2.97	2.76	1.57	2.8	2.3
Mid-Latitude (ºN)	58.99	59	59	58.99	59.01	59	59	59.01	58.99	58.99	59
Mid-Longitude (ºW)	-163.36	-168.55	-169.19	-169.83	-170.51	-171.14	-171.79	-172.45	-173.09	-173.71	-174.35
Bottom Depth (m)	23	46	54	64	71	77	87	98	107	118	127
Bottom Temperature (ºC)	5.1	3	1.8	0	-0.8	-1.1	-1.3	-0.4	1.8	2.6	2.4
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	0	71	0	0	0	123	0	479	276	844
Mature males	0	0	71	0	0	0	62	0	0	138	84
Legal	0	0	71	0	0	0	62	0	0	138	84
Immature females	0	0	0	0	0	0	62	0	0	0	1,012
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.48	0.00	0.00	0.00	0.43	0.00	0.35	1.19	0.58
Opilio Tanner Crab											
Immature males	0	584	5,227	41,773	26,632	107,648	3,634	740	1,198	7,308	4,555
Mature males	0	0	0	0	557	1,952	2,833	337	479	1,517	4,724
Legal	0	0	0	1,252	2,292	10,266	5,912	942	839	4,688	8,013
Immature females	0	584	2,543	8,546	43,169	414,541	554	0	359	0	253
Mature females	0	0	0	442	8,547	37,666	862	135	0	125,482	84
Total weight (kg)	0.00	0.09	1.90	44.31	57.81	236.40	30.88	4.36	3.79	147.82	39.32
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	141	0	3,840	289	0	135	0	0	253
Males ≥ 78 mm	0	0	0	0	0	72	0	67	0	0	169
Immature females	0	0	0	0	3,592	145	0	606	0	0	0
Mature females	0	0	0	0	124	72	0	135	0	0	0
Total weight (kg)	0.00	0.00	0.07	0.00	4.84	1.23	0.00	0.56	0.00	0.00	1.24

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	M-28	M-29	M-30	M-31	M-32	N-01	N-02	N-03	N-04	N-05	N-06
Start Date	07/25/2015	07/22/2015	07/22/2015	07/27/2015	07/26/2015	06/24/2015	06/25/2015	06/25/2015	06/25/2015	06/14/2015	06/14/2015
Duration (hour)	0.52	0.51	0.52	0.51	0.51	0.53	0.52	0.53	0.52	0.53	0.54
Distance Fished (km)	2.9	2.98	3	2.83	2.86	2.85	2.84	2.91	2.85	3.03	3.03
Mid-Latitude (ºN)	59.01	59.01	59	58.99	59	59.33	59.33	59.34	59.32	59.33	59.33
Mid-Longitude (ºW)	-175.01	-175.74	-176.31	-176.95	-177.59	-167.91	-167.23	-166.6	-165.96	-165.32	-164.66
Bottom Depth (m)	129	134	135	136	135	40	32	28	24	21	22
Bottom Temperature (ºC)	3	2.8	2.9	3.4	3.5	3.8	5.9	7	7.1	5.6	5.8
Red King Crab											
Immature males	0	0	0	0	0	74	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	74	76	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	2.06	0.77	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	920	64	0	1,153	2,409	0	0	0	0	0	0
Mature males	0	0	0	68	468	0	0	0	0	0	0
Legal	0	0	0	0	201	0	0	0	0	0	0
Immature females	854	64	125	136	67	0	0	0	0	0	0
Mature females	0	64	0	0	67	0	0	0	0	0	0
Total weight (kg)	0.34	0.32	0.02	2.34	12.42	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	526	64	313	0	0	372	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	526	128	876	203	67	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.14	0.02	0.20	0.02	0.01	0.02	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	63	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	N-07	N-18	N-19	N-20	N-21	N-22	N-23	N-24	N-25	N-26	N-27
Start Date	06/11/2015	06/27/2015	06/26/2015	07/04/2015	07/06/2015	07/07/2015	07/06/2015	07/14/2015	07/14/2015	07/14/2015	07/14/2015
Duration (hour)	0.51	0.53	0.51	0.52	0.51	0.52	0.52	0.53	0.54	0.53	0.52
Distance Fished (km)	2.79	2.99	2.87	2.91	2.84	2.89	2.95	2.85	2.95	2.96	2.93
Mid-Latitude (ºN)	59.34	59.34	59.33	59.32	59.33	59.33	59.33	59.33	59.34	59.34	59.34
Mid-Longitude (ºW)	-164.01	-168.57	-169.24	-169.87	-170.55	-171.17	-171.83	-172.5	-173.17	-173.83	-174.44
Bottom Depth (m)	23	42	50	60	68	75	81	88	101	110	120
Bottom Temperature (ºC)	6.8	3.2	1.4	0	-0.9	-1	-1.3	-0.9	0.4	1.3	2.1
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	70	0	0	0	0	0	0	0	0	0
Legal	0	70	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	3.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	65	66	65
Legal	0	0	0	0	0	0	0	0	65	0	65
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28	1.11	1.91
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	274	520	132	1,888
Mature males	0	0	0	0	0	0	0	0	130	66	0
Legal	0	0	0	0	0	0	0	0	65	66	0
Immature females	0	0	0	0	0	0	0	0	260	66	1,302
Mature females	0	0	0	0	0	0	0	0	0	66	195
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	1.92	0.65	1.58
Opilio Tanner Crab											
Immature males	0	0	0	70,357	458,648	36,388	9,809	3,559	2,664	5,399	2,474
Mature males	0	0	0	137	495	1,961	1,211	1,300	2,014	527	0
Legal	0	0	0	480	5,516	9,740	5,449	3,833	3,834	4,346	130
Immature females	0	0	72	33,052	429,302	71,221	484	3,217	2,404	329	5,339
Mature females	0	0	0	617	354	9,942	8,174	411	585	329	0
Total weight (kg)	0.00	0.00	0.04	44.56	239.20	86.82	41.54	17.28	22.79	25.96	1.97
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	271	1,029	68	325	0	326
Males ≥ 78 mm	0	0	0	0	0	0	121	0	130	0	0
Immature females	0	0	0	0	0	0	4,783	68	325	66	130
Mature females	0	0	0	0	0	0	1,938	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.66	4.49	0.08	1.81	0.01	0.06

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	N-28	N-29	N-30	N-31	O-01	O-02	O-03	O-04	O-18	O-19	O-20
Start Date	07/21/2015	07/21/2015	07/24/2015	07/26/2015	06/26/2015	06/26/2015	06/25/2015	06/25/2015	06/26/2015	06/26/2015	07/04/2015
Duration (hour)	0.52	0.52	0.51	0.51	0.52	0.52	0.54	0.48	0.5	0.52	0.52
Distance Fished (km)	2.93	2.85	2.77	2.68	2.82	2.88	2.95	2.6	2.74	3.01	2.9
Mid-Latitude (ºN)	59.34	59.34	59.33	59.34	59.67	59.66	59.66	59.64	59.66	59.67	59.67
Mid-Longitude (ºW)	-175.1	-175.75	-176.37	-177.06	-167.96	-167.28	-166.63	-165.93	-168.62	-169.27	-169.92
Bottom Depth (m)	133	137	136	149	36	31	28	25	40	48	56
Bottom Temperature (ºC)	2.8	2.7	2.7	3.1	3.9	4.5	7.2	8	2.7	1.8	0.9
Red King Crab											
Immature males	0	0	0	0	0	0	0	85	0	0	0
Mature males	0	0	0	0	0	0	0	0	80	68	0
Legal	0	0	0	0	0	0	0	0	80	68	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	74	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.89	0.00	1.17	3.05	3.28	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	196	0	0	72	0	0	0	0	0	0	0
Mature males	0	67	0	0	0	0	0	0	0	0	0
Legal	0	67	0	0	0	0	0	0	0	0	0
Immature females	65	134	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	72	0	0	0	0	0	0	0
Total weight (kg)	0.06	0.51	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	4,308	134	142	287	0	0	0	0	398	0	553
Mature males	5,026	134	0	287	0	0	0	0	0	0	69
Legal	9,072	267	142	287	0	0	0	0	0	0	138
Immature females	131	200	71	862	0	0	0	0	159	203	484
Mature females	131	334	0	0	0	0	0	0	0	0	0
Total weight (kg)	39.58	1.61	0.53	2.51	0.00	0.00	0.00	0.00	0.22	0.02	1.09
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	196	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	71	72	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	1.46	0.00	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	O-21	O-22	O-23	O-24	O-25	O-26	O-27	O-28	O-29	O-30	O-31
Start Date	07/06/2015	07/06/2015	07/06/2015	07/14/2015	07/14/2015	07/15/2015	07/15/2015	07/21/2015	07/24/2015	07/24/2015	07/26/2015
Duration (hour)	0.51	0.53	0.51	0.51	0.52	0.53	0.52	0.53	0.51	0.5	0.49
Distance Fished (km)	2.79	3.01	2.85	2.84	2.82	2.88	2.87	2.93	2.7	2.74	2.66
Mid-Latitude (ºN)	59.67	59.66	59.67	59.67	59.67	59.66	59.67	59.66	59.68	59.66	59.67
Mid-Longitude (ºW)	-170.57	-171.24	-171.9	-172.56	-173.24	-173.86	-174.45	-175.1	-175.88	-176.53	-177.15
Bottom Depth (m)	66	72	78	85	95	104	116	126	137	136	170
Bottom Temperature (ºC)	-0.8	-1.1	-1.3	-1.3	-0.7	1.2	1.8	2.5	2.5	2.7	3.1
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	72	71	0	0	0	0	0	0
Legal	0	0	0	72	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	1.47	0.94	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	460	0	0	0	71	136	69	0	73	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	461	0	0	0	0	68	0	0	0	0	0
Mature females	0	0	0	0	0	0	69	0	0	0	72
Total weight (kg)	0.49	0.00	0.00	0.00	0.02	0.13	0.16	0.00	0.01	0.00	0.36
Opilio Tanner Crab											
Immature males	44,030	14,862	5,249	26,236	2,118	1,085	11,406	3,705	290	0	3,084
Mature males	1,336	124	266	143	282	746	893	128	2,540	0	1,793
Legal	4,572	2,612	1,595	860	706	1,492	4,947	1,469	2,830	0	4,159
Immature females	32,284	4,166	2,591	77,131	3,953	1,560	0	0	290	0	215
Mature females	563	7,462	1,927	8,029	212	203	280,823	247,067	0	0	0
Total weight (kg)	49.94	36.09	13.67	56.40	5.26	8.20	220.39	159.86	19.36	0.00	23.37
Hybrid Tanner Crab											
Males ≤ 77 mm	0	622	199	0	0	0	0	0	0	0	0
Males ≥ 78 mm	0	0	0	0	0	0	69	0	73	0	0
Immature females	0	124	66	0	0	136	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.48	0.21	0.00	0.00	0.06	0.54	0.00	0.42	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	ON2524	ON2625	P-01	P-18	P-19	P-20	P-21	P-22	P-23	P-24	P-25
Start Date	07/14/2015	07/14/2015	06/26/2015	06/26/2015	06/25/2015	07/05/2015	07/06/2015	07/05/2015	07/15/2015	07/15/2015	07/15/2015
Duration (hour)	0.52	0.53	0.54	0.51	0.51	0.51	0.51	0.51	0.52	0.51	0.35
Distance Fished (km)	2.92	2.83	3.08	2.79	2.8	2.82	2.81	2.78	2.81	2.76	2
Mid-Latitude (ºN)	59.5	59.49	60	59.99	60	59.99	60	60	59.98	59.99	60
Mid-Longitude (ºW)	-172.88	-173.51	-167.99	-168.66	-169.31	-169.96	-170.61	-171.32	-171.94	-172.59	-173.26
Bottom Depth (m)	94	103	26	39	46	54	64	69	67	66	76
Bottom Temperature (ºC)	-0.5	0.6	5.5	3.4	1.2	0.5	-1	-1.3	-0.7	-0.8	-1.1
Red King Crab											
Immature males	0	0	72	0	0	0	0	0	0	0	0
Mature males	0	0	0	153	0	0	0	0	0	0	0
Legal	0	0	0	77	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.89	3.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	68	346	0	0	0	0	0	0	0	77	104
Legal	68	208	0	0	0	0	0	0	0	77	104
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	2.35	9.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	1.87
Bairdi Tanner Crab											
Immature males	205	208	0	0	0	0	0	0	0	0	104
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	205	69	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.32	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Opilio Tanner Crab											
Immature males	1,297	1,522	0	230	865	220	219,537	20,647	34,856	693	15,033
Mature males	410	1,799	0	0	0	0	356	0	0	0	104
Legal	888	2,491	0	0	0	0	5,125	1,206	2,089	77	418
Immature females	1,775	1,522	0	0	432	73	259,614	4,683	11,091	693	28,917
Mature females	205	138	0	0	0	0	285	6,457	86,493	77	418
Total weight (kg)	6.74	14.50	0.00	0.03	0.23	0.14	173.50	32.61	119.04	1.09	17.74
Hybrid Tanner Crab											
Males ≤ 77 mm	341	0	0	0	0	0	71	0	0	154	0
Males ≥ 78 mm	0	277	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.38	1.73	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.10	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	P-26	P-27	P-28	P-29	P-30	P-31	P-32	PO2423	PO2524	PO2625	PO2726
Start Date	07/15/2015	07/17/2015	07/20/2015	07/24/2015	07/25/2015	07/26/2015	07/25/2015	07/15/2015	07/14/2015	07/15/2015	07/15/2015
Duration (hour)	0.53	0.53	0.51	0.52	0.5	0.51	0.49	0.52	0.52	0.52	0.53
Distance Fished (km)	2.79	2.93	2.93	2.88	2.69	2.78	2.62	2.94	2.88	3.05	2.96
Mid-Latitude (ºN)	60	60	60	60.01	59.99	60	60.01	59.84	59.83	59.83	59.83
Mid-Longitude (ºW)	-173.95	-174.6	-175.27	-175.94	-176.72	-177.23	-177.91	-172.25	-172.91	-173.59	-174.23
Bottom Depth (m)	97	109	117	128	141	137	142	75	81	95	107
Bottom Temperature (ºC)	-0.2	0.6	2	2.3	2.4	2.5	2.1	-1.1	-1.3	-1	0.6
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	66	0	0	0	0	0	0	141	130	198
Legal	0	0	0	0	0	0	0	0	141	65	132
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	4.60	2.90	5.63
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	394	203	0	0	0
Mature males	0	0	0	0	0	0	3,073	0	0	0	0
Legal	0	0	0	0	0	0	2,600	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	158	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	28.87	0.12	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	3,054	526	1,500	10,756	759	641	4,097	28,648	2,673	29,656	659
Mature males	1,180	0	261	2,466	607	71	5,830	135	0	260	66
Legal	3,054	395	1,109	11,030	1,291	285	8,746	676	492	6,165	461
Immature females	139	197	326	69	76	783	0	44,256	4,080	0	461
Mature females	1,249	0	65	617	0	0	3,861	1,216	281	344,125	856
Total weight (kg)	16.42	2.00	6.53	53.92	7.42	1.98	53.73	44.37	4.41	347.83	2.65
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	71	0	0	0	0	0
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	68	0	0	0
Mature females	0	0	0	0	0	0	158	0	0	584	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.04	0.40	0.02	0.00	0.50	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	Q-01	Q-02	Q-18	Q-19	Q-20	Q-21	Q-22	Q-23	Q-25	Q-26	Q-27
Start Date	06/25/2015	06/25/2015	06/25/2015	06/25/2015	07/05/2015	07/05/2015	07/05/2015	07/16/2015	07/16/2015	07/16/2015	07/17/2015
Duration (hour)	0.51	0.51	0.51	0.52	0.51	0.5	0.41	0.53	0.27	0.52	0.51
Distance Fished (km)	2.9	2.83	2.96	2.79	2.78	2.77	2.25	2.88	1.41	2.94	2.9
Mid-Latitude (ºN)	60.33	60.33	60.33	60.34	60.33	60.33	60.33	60.33	60.29	60.33	60.34
Mid-Longitude (ºW)	-167.96	-167.28	-168.65	-169.28	-170.02	-170.63	-171.36	-172.06	-173.38	-174.07	-174.72
Bottom Depth (m)	31	31	36	43	52	61	66	59	63	90	103
Bottom Temperature (ºC)	5.6	6	4.2	1.4	0.4	-1	-1.3	-0.6	0.2	-0.8	0.7
Red King Crab											
Immature males	0	0	73	73	0	0	0	0	0	0	0
Mature males	0	0	73	0	0	0	0	0	0	0	0
Legal	0	0	73	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	3.22	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	72	279	0	0
Mature males	0	0	0	0	0	0	0	145	279	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	3.09	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	140	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
Opilio Tanner Crab											
Immature males	0	0	0	3,433	155	606,496	55,606	1,087	1,536	6,776	2,088
Mature males	0	0	0	0	0	538	188	0	0	261	606
Legal	0	0	0	0	0	4,224	1,225	145	0	1,238	2,155
Immature females	0	0	0	1,169	233	664,627	54,758	0	1,257	847	67
Mature females	0	0	0	0	0	307	2,450	145	0	3,258	0
Total weight (kg)	0.00	0.00	0.00	0.54	0.08	361.10	53.22	1.74	0.61	18.02	10.99
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	65	0
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	Q-28	Q-29	Q-30	Q-31	QP2423	QP2524	QP2625	QP2726	R-22	R-23	R-24
Start Date	07/20/2015	07/23/2015	07/25/2015	07/25/2015	07/16/2015	07/15/2015	07/16/2015	07/16/2015	07/16/2015	07/16/2015	07/17/2015
Duration (hour)	0.52	0.5	0.51	0.44	0.52	0.52	0.53	0.51	0.52	0.52	0.52
Distance Fished (km)	3.04	2.8	2.83	2.39	2.81	2.97	2.87	2.81	2.91	2.84	2.86
Mid-Latitude (ºN)	60.33	60.33	60.34	60.33	60.16	60.18	60.13	60.16	60.67	60.66	60.67
Mid-Longitude (ºW)	-175.39	-176.04	-176.72	-177.37	-172.32	-173.02	-173.77	-174.35	-171.44	-172.12	-172.77
Bottom Depth (m)	112	122	136	148	59	59	89	100	63	61	45
Bottom Temperature (ºC)	1.2	2.1	2.3	2.1	2.8	0.3	-1.1	0.5	-1.3	-1.2	3.1
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	583	71	0	0	0	0	2,227
Mature males	0	0	0	0	728	71	0	210	0	0	6,144
Legal	0	0	0	0	291	71	0	70	0	0	3,917
Immature females	0	0	0	0	0	71	0	0	0	0	0
Mature females	0	0	0	0	73	0	0	0	0	0	77
Total weight (kg)	0.00	0.00	0.00	0.00	18.56	1.80	0.00	4.16	0.00	0.00	138.29
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	70	77
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08
Opilio Tanner Crab											
Immature males	1,748	2,057	0	169	364	1,698	5,191	210	221,063	100,193	230
Mature males	1,929	497	72	0	0	0	65	70	0	0	0
Legal	3,254	1,419	72	84	0	283	649	70	199	0	0
Immature females	0	0	145	169	219	1,627	2,466	0	274,756	108,613	384
Mature females	362	6,172	72	0	146	0	5,126	0	728	3,508	0
Total weight (kg)	19.38	15.14	0.80	0.34	0.36	1.80	15.89	0.82	193.43	113.29	0.21
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	324	0	0	0	0
Males ≥ 78 mm	60	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	65	0	0	0	0
Total weight (kg)	0.54	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	R-25	R-26	R-27	R-28	R-29	R-30	R-31	R-32	S-22	S-23	S-24
Start Date	07/17/2015	07/17/2015	07/17/2015	07/19/2015	07/23/2015	07/23/2015	07/23/2015	07/21/2015	07/17/2015	07/17/2015	07/17/2015
Duration (hour)	0.51	0.53	0.52	0.52	0.5	0.51	0.52	0.5	0.52	0.51	0.51
Distance Fished (km)	2.91	2.95	2.94	2.9	2.77	2.83	2.79	2.76	2.86	2.83	2.8
Mid-Latitude (ºN)	60.67	60.67	60.67	60.66	60.66	60.67	60.67	60.67	60.99	61	61
Mid-Longitude (ºW)	-173.48	-174.15	-174.82	-175.45	-176.2	-176.8	-177.52	-178.18	-171.45	-172.15	-172.81
Bottom Depth (m)	67	86	98	107	119	129	147	161	60	64	67
Bottom Temperature (ºC)	0	-0.8	-0.2	0.8	2	2.2	2.2	2.3	-1	-1	-0.2
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	68	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	72	0	0	0	0
Legal	0	0	0	0	0	0	72	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	73,445	31,649	6,103	3,431	3,040	1,945	0	2,352	137,743	42,560	59,492
Mature males	0	483	328	1,036	2,244	6,340	0	2,629	0	0	0
Legal	340	3,586	2,166	2,849	5,139	8,069	0	4,428	0	0	0
Immature females	58,008	5,861	0	0	0	72	143	208	179,905	33,600	59,879
Mature females	17,613	86,604	32,157	65	434	0	72	12,593	409	578	1,288
Total weight (kg)	83.27	124.70	46.48	19.33	26.19	46.38	0.11	37.59	98.61	26.23	52.47
Hybrid Tanner Crab											
Males ≤ 77 mm	476	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	0
Immature females	204	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	S-25	S-26	S-27	S-28	S-29	S-30	S-31	T-25	T-26	T-27	T-28
Start Date	07/18/2015	07/18/2015	07/19/2015	07/19/2015	07/21/2015	07/21/2015	07/21/2015	07/18/2015	07/18/2015	07/19/2015	07/20/2015
Duration (hour)	0.52	0.51	0.54	0.5	0.51	0.5	0.51	0.52	0.51	0.53	0.5
Distance Fished (km)	2.9	2.82	3.12	2.89	2.79	2.77	2.71	2.87	2.79	2.9	2.71
Mid-Latitude (ºN)	61	61	61.01	61	60.99	61	61	61.33	61.33	61.33	61.34
Mid-Longitude (ºW)	-173.5	-174.19	-174.88	-175.54	-176.28	-176.98	-177.63	-173.58	-174.33	-175	-175.66
Bottom Depth (m)	76	83	92	102	112	122	135	74	79	88	96
Bottom Temperature (ºC)	-1	-0.9	-0.6	0.7	1.1	1.7	2.1	-1.4	-1.5	-1.5	-0.6
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	73
Legal	0	0	0	0	0	0	0	0	0	0	73
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	71,275	67,701	14,606	6,547	3,116	2,776	784	82,902	45,825	10,171	9,327
Mature males	0	71	61	1,136	991	4,580	428	0	0	0	219
Legal	1,100	4,978	2,332	3,675	2,833	7,009	1,069	415	141	262	1,749
Immature females	58,835	23,468	1,411	735	2,266	278	0	61,071	29,302	1,640	73
Mature females	2,818	15,645	8,837	334	71	0	0	2,211	9,956	5,709	5,465
Total weight (kg)	75.15	102.88	41.48	23.34	14.75	39.86	5.63	55.23	46.63	19.00	21.91
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	67	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	T-29	T-30	U-25	U-26	U-27	U-28	U-29	V-25	V-26	V-27	V-28
Start Date	07/20/2015	07/20/2015	07/18/2015	07/18/2015	07/18/2015	07/20/2015	07/19/2015	07/18/2015	07/19/2015	07/19/2015	07/19/2015
Duration (hour)	0.52	0.51	0.51	0.51	0.5	0.52	0.5	0.51	0.52	0.51	0.46
Distance Fished (km)	2.88	2.76	2.77	2.87	2.95	2.76	2.72	2.73	2.85	2.81	2.53
Mid-Latitude (ºN)	61.33	61.34	61.66	61.66	61.67	61.67	61.67	62	62	62	62
Mid-Longitude (ºW)	-176.31	-176.97	-173.67	-174.4	-175.09	-175.79	-176.46	-173.75	-174.49	-175.18	-175.82
Bottom Depth (m)	107	116	71	77	85	96	105	63	73	81	90
Bottom Temperature (ºC)	1.1	1.3	-1.2	-1.3	-1.3	-0.6	0.7	-0.8	-1.1	-1	-0.4
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	14,551	1,565	27,707	49,112	3,171	7,112	3,617	82,825	4,165	1,319	3,890
Mature males	202	569	0	0	0	71	72	0	0	0	0
Legal	6,602	1,423	0	69	66	427	1,736	0	72	0	78
Immature females	0	783	22,791	70,160	2,246	2,774	0	71,025	1,221	440	156
Mature females	337	0	1,788	4,932	1,387	1,920	2,243	2,241	862	806	4,045
Total weight (kg)	40.91	7.52	15.75	47.50	3.65	11.73	11.07	55.90	4.78	1.83	7.44
Hybrid Tanner Crab											
Males ≤ 77 mm	0	0	0	0	0	0	0	0	0	0	0
Males ≥ 78 mm	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2015 eastern Bering Sea bottom trawl survey stations.

Station	Z-05
Start Date	06/09/2015
Duration (hour)	0.51
Distance Fished (km)	2.82
Mid-Latitude (ºN)	54.68
Mid-Longitude (ºW)	-165.14
Bottom Depth (m)	82
Bottom Temperature (ºC)	5.9
Red King Crab	
Immature males	0
Mature males	0
Legal	0
Immature females	0
Mature females	0
Total weight (kg)	0.00
Blue King Crab	
Immature males	0
Mature males	0
Legal	0
Immature females	0
Mature females	0
Total weight (kg)	0.00
Bairdi Tanner Crab	
Immature males	216
Mature males	0
Legal	0
Immature females	216
Mature females	0
Total weight (kg)	0.14
Opilio Tanner Crab	
Immature males	0
Mature males	0
Legal	0
Immature females	0
Mature females	0
Total weight (kg)	0.00
Hybrid Tanner Crab	
Males ≤ 77 mm	0
Males ≥ 78 mm	0
Immature females	0
Mature females	0
Total weight (kg)	0.00

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