UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

December 7, 2004

Mr. Ben Enticknap
Fishery Project Coordinator
Alaska Marine Conservation Council
Box 101145
Anchorage, Alaska 99510

Dear Mr. Enticknap:

Thank you for your letter regarding the National Marine Fisheries Service's (NMFS's) preliminary responses to public comments on the Draft Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska (EFH EIS). In particular, you asked for clarification of our analysis of the effects of bottom trawling on Bering Sea crab habitat and our use of related work by NMFS researchers Braxton Dew and Bob McConnaughey.

NMFS considered the alternative views advanced by Dew and McConnaughey that the area north of Unimak Island is a "primary broodstock area" for Bristol Bay red king crab, is essential for rebuilding the Bristol Bay population, and has been adversely affected by bottom trawling. NMFS considered their presentations (cited in your letter), an early version of their related manuscript that has now been accepted for publication, and the other references that you cited, along with other data and the professional opinions of other NMFS scientists. Dew and McConnaughey's work reflects an intriguing theory, but does not fully take into account survey results on crab distributions prior to 1975. Nor does it fully address the history of fishery management measures and regulations that have been adopted to control trawl bycatch and limit habitat impacts. The enclosed document provides a more detailed explanation of the information about crab habitat that NMFS used in the draft EFH EIS.

We appreciate your concern about this issue. NMFS shares your interest in ensuring that the North Pacific Fishery Management Council's decisions regarding EFH are informed by the best available scientific information, including open discussion regarding differences of professional opinion.

Sincerely,

For James W. Balsiger
Administrator, Alaska Region

Enclosure

cc: North Pacific Fishery Management Council

Background Information Regarding the Analysis of the Effects of Bottom Trawling on Bering Sea Crab Habitat in the Draft Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska

Bycatch of Bering Sea crabs has been a longstanding concern for the North Pacific Fishery Management Council and the National Marine Fisheries Service (NMFS). Bycatch has increased mortality of Bristol Bay Red King Crab (BBRKC) over the levels associated with landings and natural mortality, and has engendered considerable controversy. Bycatch must have increased the rate of decline for BBRKC, but probably was not the primary cause of a decline that has almost certainly reduced year class strength and recruitment and increased the mortality rate. NMFS and the Council were not able to determine that trawl bycatch was a conservation concern in the 1980s because existing evidence did not show that trawl bycatch numbers were a significant source of mortality in BBRKC or other stocks. Rather, the Council determined that bycatch was wasteful and should be minimized as a precaution.

Bycatch of various crabs in the Bering Sea / Aleutian Islands (BSAI) area has been one of the most widely debated issues by the Council. It was the subject of a formal work-study group, several appointed committees, emergency actions, and at least five Amendments (10, 12a, 21, 37 and 41) to the BSAI groundfish plan. Trawl bycatch of BBRKC was among the first such issues the Council addressed and has been an issue in all succeeding bycatch discussions, leading to progressively more restrictive measures to control bycatch. The intense Council and agency scrutiny, public awareness, and new regulations had the effect of reducing bycatch of BBRKC considerably. According to the 2004 Crab Stock Assessment and Fishery Evaluation (SAFE) Report, trawl bycatch of BBRKC has not exceeded 100,000 crabs since 1994. This number has been far exceeded by incidental catch in crab fisheries in each year since 1995. The SAFE document indicates that BBRKC bycatch mortality from all sources has not exceeded 1% of the trawl survey population abundance index in more than a decade.

The NMFS observer database for 1975-2002 shows that males were more than 40% of the sampled red king crab bycatch in all but four years. Most pertinently, males made up less than 40% in 1981 and 1982 due to high prevalence of females in joint venture (JV) fisheries. The 1981-82 JV fisheries occurred almost entirely to the east of the Unimak Island area (much effort was actually east of the pot sanctuary in the 1980s). It is particularly unlikely that JV fisheries were as important a cause of the decline in RKC as concluded by Dew and McConnaughey. Abundance in the area immediately north of Unimak Island declined drastically in the late 1970s and by 1980 the area north of Unimak Island was no longer very important for RKC. This area dominated the distribution of BBRKC adult females for a short period of time during the 1970s as BBRKC abundance was growing. During the previous peak (circa 1959-1961) the area was not particularly important although some mature females were found there. Some survey work was conducted in the late 1950s as the population was approaching its previous peak (Figure 1 is representative). The distribution of BBRKC in 1959 was not as well covered by trawl surveys, but the data depict the relative abundance east and west of False Pass (~163 degrees West longitude) which separates the Alaska Peninsula from Unimak Island (see Figure 1, which was

taken from a document submitted to the International North Pacific Fisheries Commission (INPFC) by the United States). This distribution was documented just before the Japanese no trawl zone was negotiated in 1960. Almost all catches exceeding 10 crabs per pot would be protected by the current closed areas. Surveys and exploratory fishing conducted in the late 1930s were not as explicit as those in the 1950s in their coverage of the Unimak Island area, but also indicated that most of the mature female population was found in the area east of False Pass. Surveys conducted by the USSR, Japan and the International Pacific Halibut Commission during the 1960s support the idea that the North Unimak Island area, though of varying importance, was at the western edge of the distribution of female BBRKC. The U.S. began to survey BBRKC again in the late 1960s, and the distribution of females at that time probably produced the large year classes that supported record fisheries in the late 1970s. This information calls into question the Dew and McConnaughey conclusion that the area north of Unimak Island is a "primary broodstock area" for Bristol Bay red king crab. In addition, subsequent surveys were conducted in all years except 1971, when a partial survey was conducted. The data depicted in Figure 2 were taken from the spring 1968 survey. Survey data clearly show that the area north of Unimak Island did not become a dominant area for the reproductive potential of BBRKC until 1972. The winter of 1971-1972 was among the coldest on record, and cold conditions in Bristol Bay may have affected BBRKC distribution as well.

Distribution charts for Japanese, Soviet, and IPHC surveys are included in baseline documents for the Outer Continental Shelf Environmental Assessment Program (e.g., Pereyra, Reeves and Bakkala 1975, Demersal Fish and Shellfish Resources of the eastern Bering Sea in the Baseline year 1975, Northwest Fisheries Center Processed Report, Oct. 1976. 2 vol.). Early US surveys were documented in INPFC annual reports and associated documents. The pre-1980 history of the BBRKC fishery and associated research is largely covered in INPFC literature. For female distribution, the Annual Reports for 1971, 1972 and 1973 are useful and the 1974 survey is contained in Document 1734. While surveys prior to 1975 are not quantitatively identical to later surveys, for most purposes they are adequate to judge the relative distribution of female RKC. The area north of Unimak Island was very important or even dominant from 1972 to 1974, but the dominant area began to shift eastward in the late 1970s to the area more typical of the years prior to 1972. In this regard the distribution was transitional in 1975 and 1976 (also a cold period) and near complete by 1978.

Figure 3a shows that the majority of the population of females greater than the size at 50% maturity was west of 163 degrees until 1977 and that the area west of 163 degrees ceased to be dominant in 1978 (before trawling began in the Pot Sanctuary). Note that 163 degrees is just east of False Pass and hence marks the approximate eastern limit of the Unimak Island area, as well as the western limit of the seasonal closure area for trawling which is entirely closed east of 162 degrees (excepting a small yellow fin sole area in northern Bristol Bay). In viewing Figure 3, we note that areas west of 164 are protected by inshore closure areas designed for protecting Steller sea lions and bycatch caps; areas from 163 to 164 are protected by the King crab savings area and caps; areas from 162 to 163 degrees are protected by the seasonal closure area, the savings area and caps; and areas east of 162 degrees are almost wholly protected from trawling (excepting the

small yellowfin sole fishing area south of Togiak Bay). Figures 3b and 3c show that the north Unimak Island area was not of large importance at any time during the 1980s, while Figure 3d shows that the same area has not, on average, been very important to females in the period since 1975 and is probably more important to males. Figure 4 shows that the center of distribution for the same period of time has almost always been east of 163 degrees just as it was in 1959. If we were to define a primary area of BBRKC reproductive potential, it would have to be east of 163 degrees, and even east of 162 degrees in some years.

We note also that almost all areas of the Gulf of Alaska west of Cape Suckling that were known to be important for red king crab breeding and nursery areas have been closed to trawling and scallop dredging for long periods of time (15 to more than 30 years). The red king crab fishery has been closed over most of this area since 1982 and all of it since 1983. The most recent Alaska Department of Fish and Game crab surveys do not indicate any substantial recovery nor have they at any time since 1982. Likewise, many closure areas exist in the eastern Aleutian Islands (Dutch Harbor management area) where the red king crab stock continues in low abundance since the fishery was closed in 1983. Also, blue king crab abundance in the Pribilof Islands District has declined steadily throughout the period since the area was closed to trawling. As with Bristol Bay, protection of reproductive potential as well as known or even suspected (north shore of Bristol Bay) nursery areas may be appropriate even though direct evidence linking trawl closure areas to king crab recovery is scant.

Some recruitment to the north Unimak Island area may also derive from allochthonous larvae. The Alaska Coastal Current, which flows along the south side of the Alaska Peninsula, turns northward through Unimak Pass and enters the Bering Sea, following closely along the north side of the Peninsula. The Aleutian North Shelf Current sweeps the north side of the Aleutian Island chain and mixes with the waters of the Alaskan Coastal Current in the north Unimak Island area. Relative peaks in population abundance in the South Peninsula and Dutch Harbor area coincided with record populations in the EBS and north Unimak Area. Populations of red king crab in this western most portion of Bristol Bay may be augmented by advection of larvae by these currents. Extreme declines in adjacent populations occurred contemporaneously with those in Bristol Bay and few larvae would have been available from these sources from 1983 onward.

In retrospect, the idea that trawl closures in the Gulf of Alaska and the eastern Bering Sea constitute most of the area critical to crab populations may be somewhat of an overstatement, particularly with respect to snow crab and certain deepwater species. Critical areas for snow crab have not been determined and may be time period specific. However, some measure of protection is still provided by caps which provide a disincentive to fishing in areas where concentrations of snow crab are found. As noted in the 2004 Crab SAFE document, estimated bycatch of snow crab in trawl fisheries has not exceeded six million crabs since 1994, and bycatch mortality from all sources has exceeded 0.6% of the survey abundance index only once in that time period. This suggests that snow crabs and hence their habitats are not being seriously disrupted.

Figure 1. The Relative distribution of female red king crab taken during a 1959 survey conducted by the Bureau of Commercial Fisheries. The size of 89 mm carapace length is relevant because this is the size at which 50% of females are mature. The areas of maximum catch per tow are located at the western end of the Alaska Peninsula between Port Heiden (ca 160 degrees W) and Isonoski Strait or False Pass (ca 163 degrees W.) which separates Unimak Island from the Alaska Peninsula.

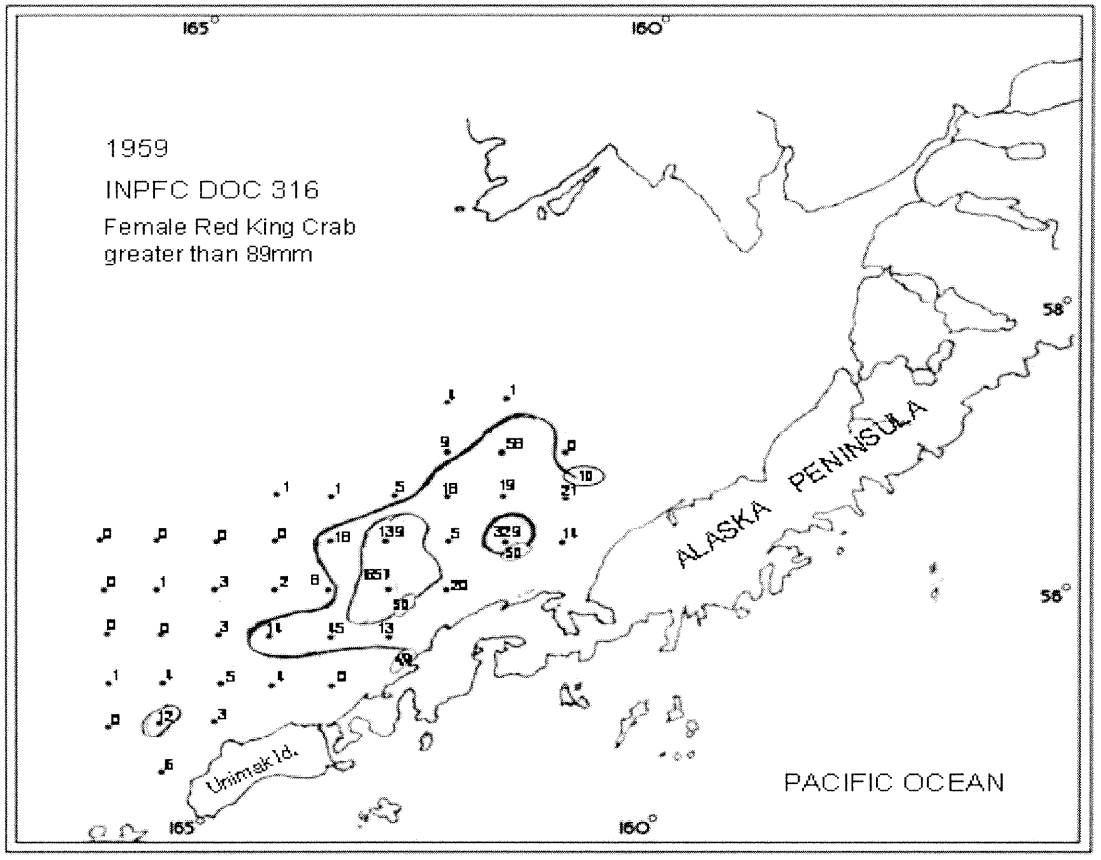
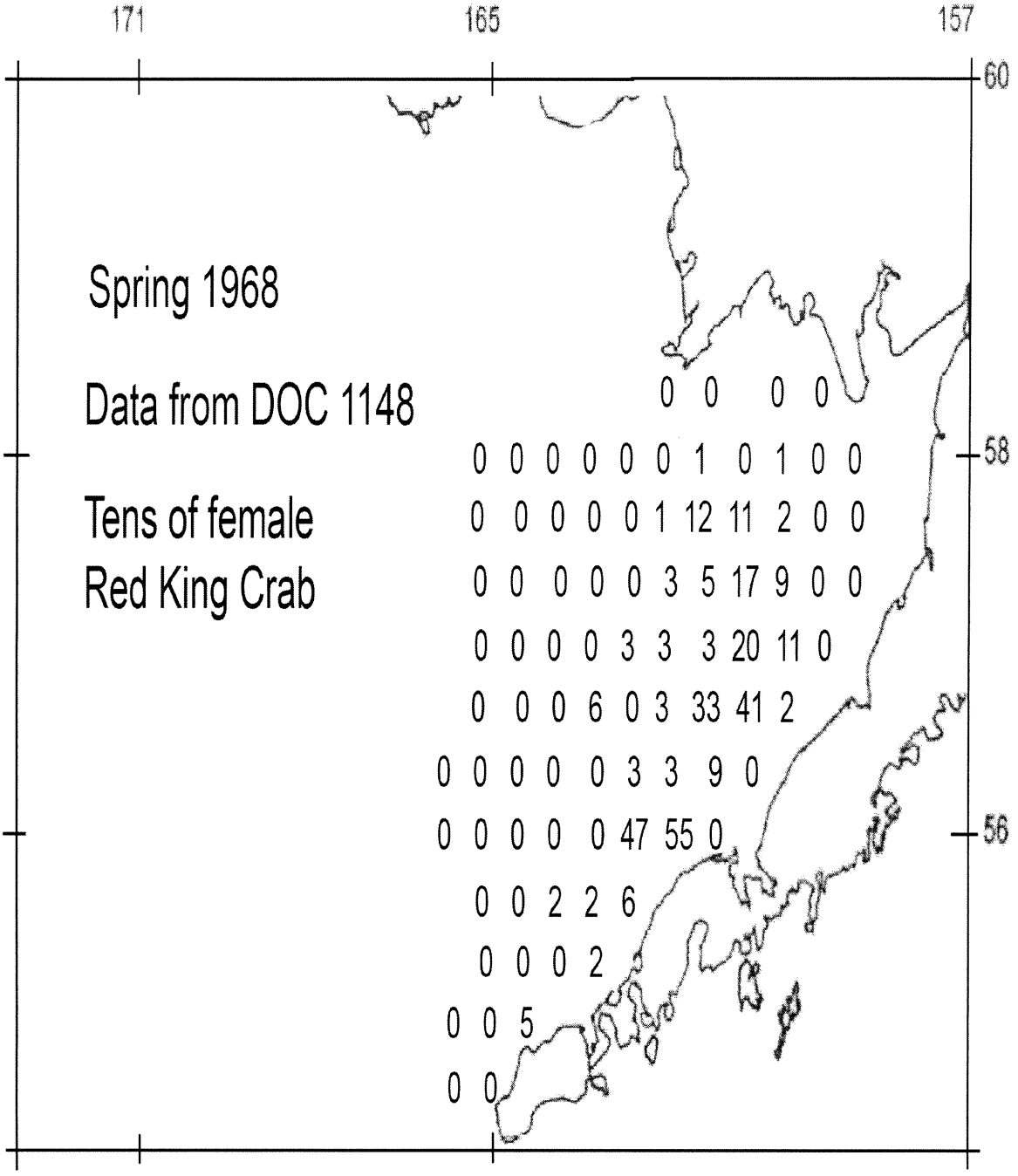
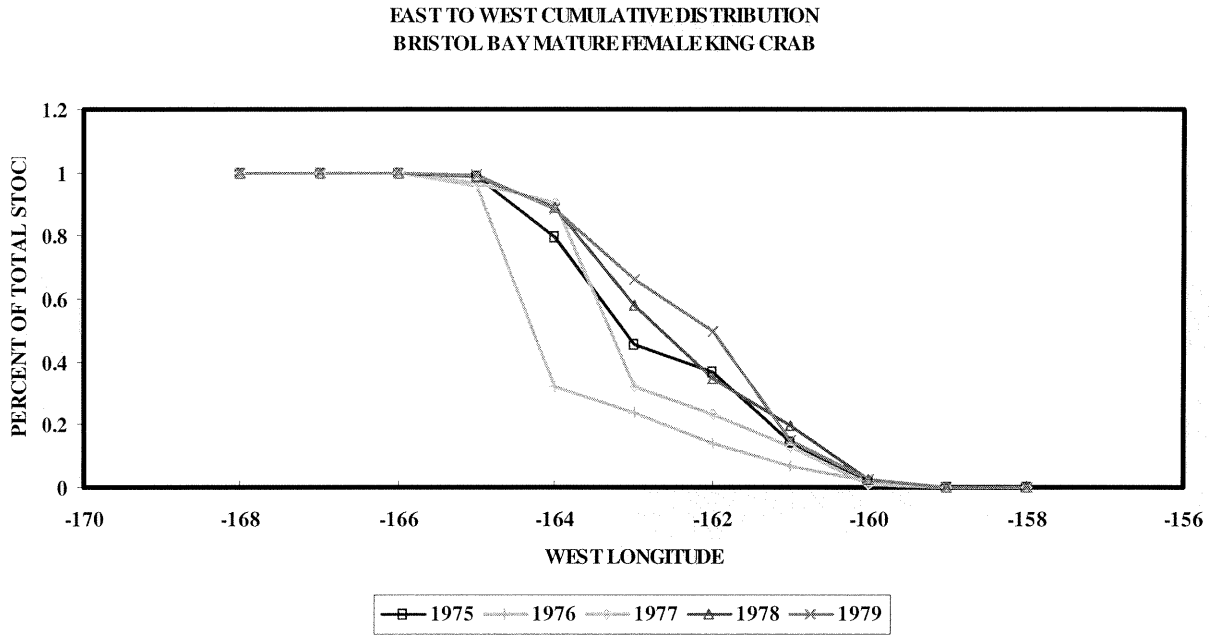


Figure 2. The distribution of female red king crab taken in the spring of 1968 during a survey conducted by the Bureau of Commercial Fisheries R/V John R. Manning (International North Pacific Fisheries Commission, Data from Document 1148, United States)





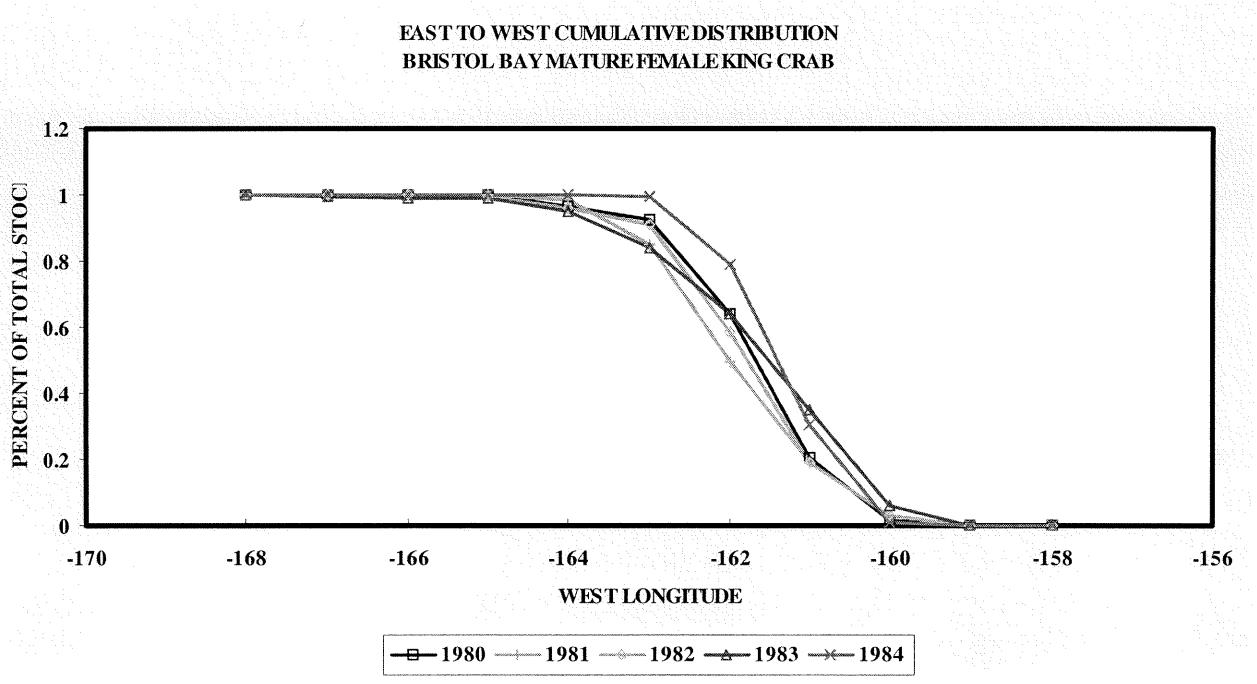


Fig 3a. 1975-79 E-W distribution of female red king crab larger than 89 mm carapace width.

Fig 3b. 1980-84 E-W distribution of female red king crab larger than 89 mm carapace width.

Figure 3c 1985-89 E-W distribution of female red king crab larger than 89 mm carapace width.

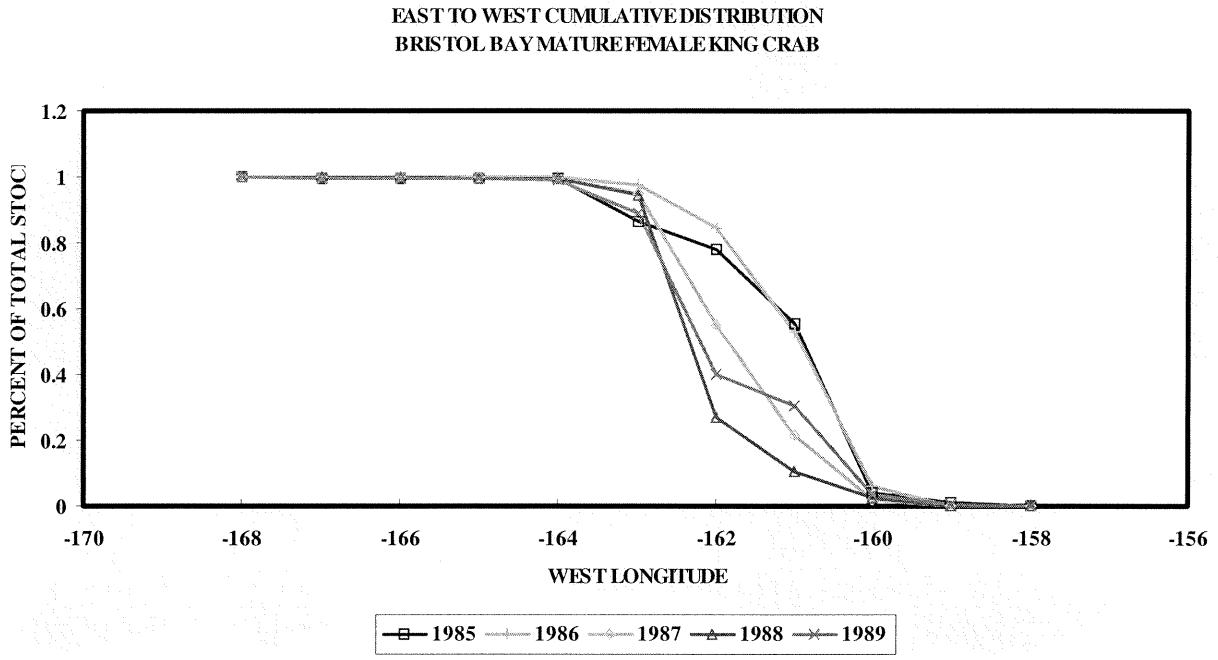


Figure 3d 1975-2002 average E-W distribution of female red king crab larger than 89 mm carapace width.

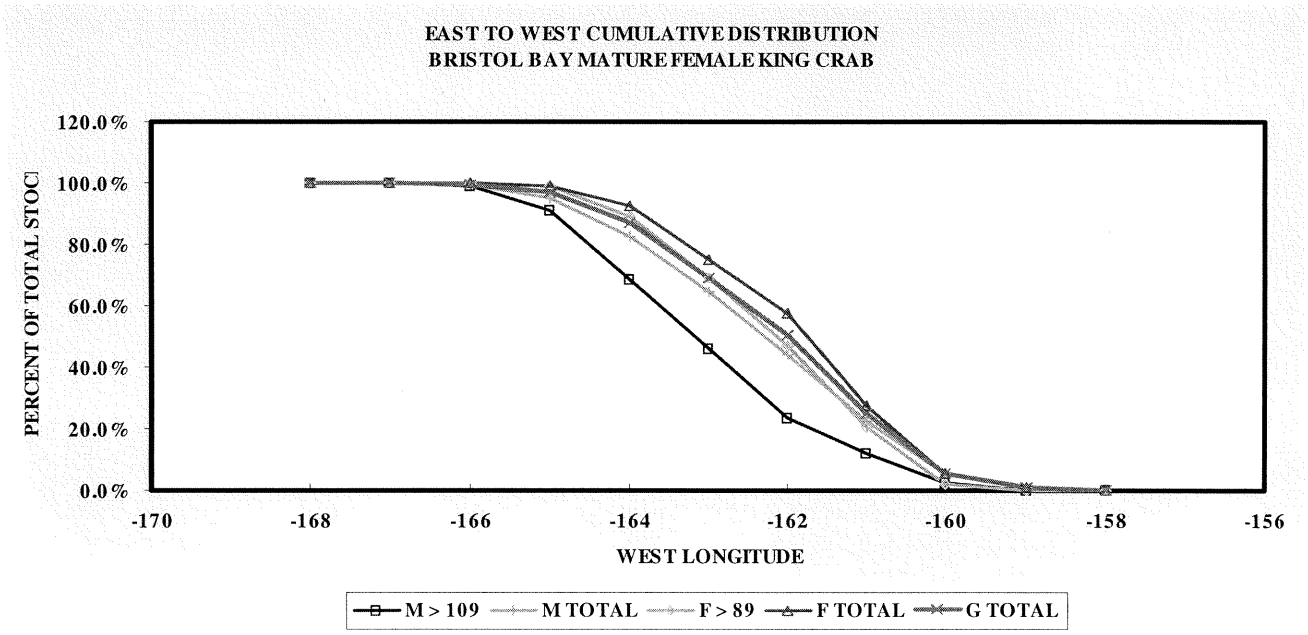


Figure 4. E-W distribution of red king crab stock components from NMFS surveys.