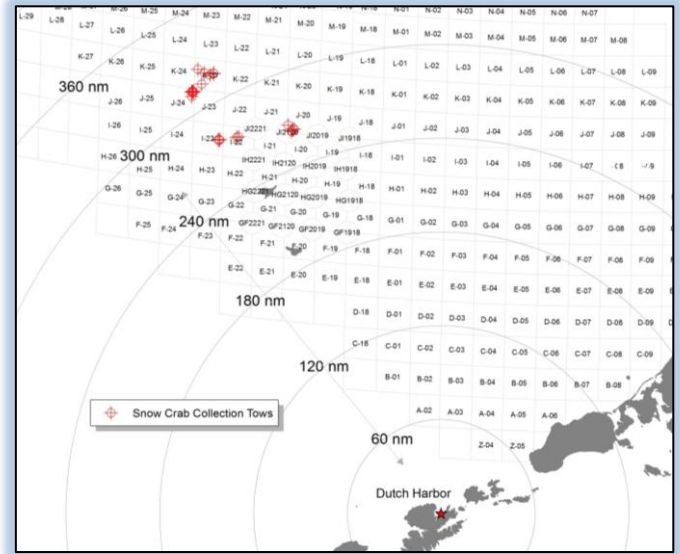


## **2011 Bering Sea Snow Crab Growth Collection Cooperative Survey**

The *F/V Half Moon Bay* was chartered by the Bering Sea Fisheries Research Foundation (BSFRF) for a 7-day snow crab survey to collect live pre-molt crabs for a snow crab growth-per-molt study. This work was a cooperative research effort between BSFRF, the National Marine Fisheries Service (NMFS) and the Alaska Department of Fish and Game (ADF&G). The main objective of this research was to collect juvenile snow crab during the spring when they are known to molt, transport them from the molting areas on the northwest Bering Sea shelf to holding facilities both at Dutch Harbor and at the NMFS Alaska Fisheries Science Center Kodiak laboratory and maintain them until they molt. The data from this experiment would then be analyzed to produce a function that will allow the prediction of postmolt carapace width from premolt width. The resulting information would be used in the snow crab stock assessment model to improve the estimation of snow crab growth per molt within the model.



The collection of samples was completed successfully with more than 5,000 crabs sorted and 800 collected during three days of towing in the Bering Sea (see map). The sampling was conducted April 11-13 capturing several thousand crab. The large majority of these were not in the condition of choice (pre-molt or older shell near pre-molt) for retention as part of the study. Heavy ice flows and an ice edge prevented searching for more crab of choice sizes and conditions. Of the 15 size/sex bins planned for collection, in only one were no crab captured (males 110-120mm). Onboard holding was setup in two on-deck tanks (2 x 200 gal insulated) with recirculating seawater, onion bags, and individual containers for some crab. Onboard survival was high and several crab molted in the onion bags onboard and some preliminary measurements of pre-post-molt crab were recorded. Transfer of crab to the dock tanks at Unisea (50% of crab) and transit to Kodiak (other 50% of crab) was completed as efficiently as possible. A number of issues however, related to transfer, handling, tank holding, feeding and survival of snow crabs became apparent for the different groups of crabs held during the study. Results from measurements of crabs that molted were analyzed in groups; those that molted onboard the capture vessel, molts in tanks at Dutch Harbor and molts in holding at Kodiak. Prior research data of snow crab growth per molt were treated as another group for comparison. Selection of data to be used for the final development of Bering Sea snow crab growth function was complicated by differences among the groups of crab. The Dutch Harbor holding data was not significantly different from the Dutch Harbor transit data and was pooled. NMFS prior research data was not significantly different from the pooled data and was also pooled. The Kodiak holding data was significantly different from the pooled data and was excluded from the function. Finally, prior ADF&G holding data was significantly different from the pooled data and was also excluded from the function. Both of the excluded data sets had postmolt widths that were less than predicted by the pooled data.



These results emphasize the importance of keeping the duration of the premolt holding period as short as possible. For the two experiments where the premolt crabs were maintained with feeding for a longer period in a laboratory setting, the growth per molt was less than crabs experiencing less handling and a shorter holding duration. In addition, for the experiment where the crabs were maintained in nets without feeding, molting stopped and mortality increased after 2-3 weeks of captivity. The relationship between premolt and postmolt width currently used in the snow crab stock assessment model is expressed as a straight line which was based on data from a 2003 seasonality study. This function produces a slight overestimate of premolt width for small crabs compared to the models based on the new data. Although the new growth function does not materially change the predicted growth per molt, the increased range of premolt width and the greater number of crabs included in the new data greatly reduces the uncertainty in the relationship. Final review of these results is underway which includes the use of the new function in the snow crab stock assessment model.