

Bradley Stevens (NOAA/NMFS, Kodiak Laboratory):

## **Mounds and mounds of Tanner crabs**

web link: <http://www.afsc.noaa.gov/kodiak/photo/bairdi.htm>

The population levels of snow and Tanner crabs in Alaskan waters are subject to severe swings; the yearly catch reached a peak value of \$400 million in 1991, but current population levels are so low that the fishery has been closed in the Gulf of Alaska and Bering Sea. Other crab species and many fish apparently respond to oceanographic changes associated with the Pacific Decadal Oscillation, but the snow and Tanner crab populations are not correlated with those species. What drives the population cycles in the snow and Tanner crabs?

In 1991, with funding from NURP's West Coast & Polar Regions Undersea Research Center, Brad Stevens and colleagues from the NMFS (Kodiak) discovered huge aggregations of Tanner crabs during the spring mating season in Chiniak Bay, Alaska. The reproductive females assembled in mounds up to a meter high and several meters long, spread over an area approximately the size of two soccer fields and containing hundreds to thousands of individuals. Prior to mating, each female releases a few hundred thousand larvae that have been brooded since the previous year's mating. Males were scattered on the seafloor around the mounds. Systematic observations by Stevens and others over the past decade have led to a hypothesis that the timing of the Tanner crab mating aggregations is controlled by the spring high tide and is decoupled from other environmental controls. This suggests that environmental conditions in a given year at the time of the spring high tide might dramatically affect recruitment of Tanner crabs and related species (e.g., snow crabs).

The West Coast & Polar Regions Undersea Research Center is currently co-sponsoring a study by Brad Stevens (NMFS, Kodiak) and Dan Urban (Alaska Dept of Fish & Game). During the 2002 field season they used a Phantom HD2 ROV and a custom-built video camera sled to survey the crab mounds weekly during the spring, and monthly through the rest of the summer. Preliminary results indicate that the spawning and mating aggregation is indeed synchronized with the spring tide. Environmental data collected through the season will be combined with previous years' data to construct a model for the timing of larval release and for predicted recruitment success, as an indicator of future population levels. The researchers also surveyed three other bays where large catches of female Tanner crabs have been reported; however, no mounds were found in those locations, suggesting that the Chiniak Bay site is uniquely important as a traditional spawning ground.