

Proposal

Using Photo-Identification to Monitor Dolphin Health in the Mississippi Sound

Institute for Marine Mammal Studies

Proposal Description:

Bottlenose dolphins (*Tursiops truncatus*) are a highly abundant apex predator in the Mississippi Sound. This area houses one of the largest populations of bottlenose dolphins in the United States. This is important because bottlenose dolphins are sentinel species in which their health is a reflection of the health of the ecosystem, which makes them a very important species for continuous, long-term monitoring. The Institute for Marine Mammal Studies has been monitoring the population in the Mississippi Sound since 2010 through a long-term photo-identification study. This has provided important information on dolphin habitat use, distribution, and movements both within and outside the Mississippi Sound. This long-term study also allows for the evaluation of short term variability, acute changes, and overall trends of this dolphin population in response to specific events.

Dolphins in the Mississippi Sound are especially important to monitor because this area is highly affected by anthropogenic impacts that can negatively impact the local dolphin population, surrounding ecosystem, and fishing industries. The biggest impacts are from freshwater diversions that introduce trillions of gallons of freshwater into this area. The Bonnet Carre Spillway in particular is a diversion that was constructed to artificially divert water into the Mississippi Sound during periods of substantial flooding of the Mississippi River. This pumps polluted freshwater into this area, which significantly lowers the salinity within the Sound. Dolphins have a certain threshold of freshwater that they are able to tolerate, after which their health is negatively impacted, causing disease and death to the animals. One major indicator of health deficits is the presence of freshwater lesions on the skin of animals exposed to low salinity water for long periods of time. The Institute for Marine Mammal Studies recently published a study showing that freshwater input, particularly from the Bonnet Carre Spillway, correlates with increased stranding events and presence of lesions. The presence of these lesions indicates that there is a severe environmental threat facing the surrounding ecosystem, including economically important fishing industries.

Similar to epidemiology in humans monitoring population health through symptom reports, our goal is to continue to monitor the health of our bottlenose dolphin population through the prevalence of skin lesions. By continuing to use photo-identification methodologies to monitor the location, seasonality, and environmental conditions surrounding these lesions within the Mississippi Sound, we can estimate and predict the current and future health of the ecosystem. Future work will continue to monitor these lesions and work to identify their source, such as pollution, freshwater inputs, or disease outbreaks within the population. This information can be combined with information gathered from our ongoing stranding program, which allows for pathological assessment of causes of death of stranded bottlenose dolphins. This combination of live-animal health monitoring and pathology of deceased individuals will allow for identification of potential environmental stressors and future predictions of impacts on ecosystem health.