Cook Inlet beluga whale behavioral observations via video-monitoring

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Project Summary

Alaska SeaLife Center initiated the Cook Inlet Beluga Remote Monitoring pilot study in the summer of 2011. Two cameras were located 1.5 miles up the Little Susitna River

Objectives:

•Evaluate the capabilities of remote video monitoring.

•Monitor the frequency of occurrence, relative abundance, and surface behavior of beluga whales.

Methods

•Cameras controlled remotely with real time video displayed.

•Scans of the study area were conducted every 20 minutes.

•Data collection included beluga presence, group location, size, composition, and behaviors as well as environmental conditions, human presence, and interactions with other marine mammals.

•Group behaviors were recorded as primary secondary or tertiary.

Behavior	Description
Unknown	Behavior indistinguishable due to monitoring conditions and/or lack of ability watch whale for length of time to determine behavior.
Traveling/Moving	Belugas progressing in a particular direction.
Diving	Beluga has arched back usually with tail fluke briefly coming out of water before disappearing.
Spyhopping	Leading with the head beluga comes out of water perpendicular to the surface.
Breaching	At least 3/4 of body clears the water (not directly perpendicular to surface).
Feeding Suspected	Belugas thought to be foraging based on movement patterns and/or environmental proxy.
Milling	Random movement in multiple directions.
Startled Effect	Sudden drastic change in behavior.
Tail Slapping	Rapid peduncle flex causing fluke to quickly hit surface of the water with force producing a splash.
Other	Behavior that is distinguishable but not listed above.

Results

•Primary behaviors of beluga whales: milling, traveling, and unknown.

•Secondary behaviors: milling, traveling, feeding suspected, diving, spyhopping, and other.

•Tertiary behaviors: traveling, feeding suspected, diving, spyhopping, tail slapping, and other.

•Secondary or tertiary activities recorded as “other” were described as headstands, bobbing, listing while showing pectoral fins, and excessive splashing.

•The remotely captured behavioral information in this secluded location added finer detailed information to the existing body of knowledge about this species.

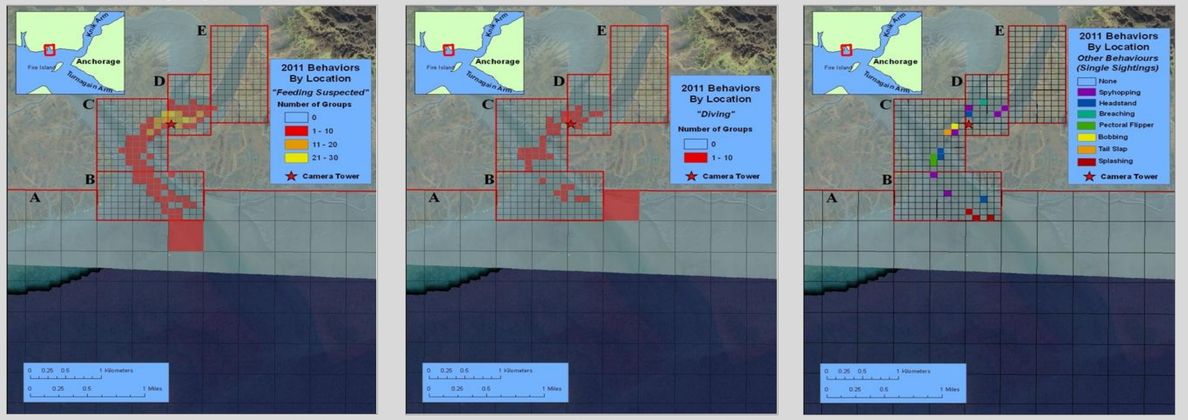
Beluga whale sighting data

Month	Max Sighting Duration (min)	Max White	Max Gray	Max Dk Gray	Max Unkn	Max Total*	Primary Behavior of Group	Secondary Behavior of Group	Tertiary Behavior of Group
May	33	15	16	6	0	30	1, 8	1, 2	-
June	344	36	5	3	21	46	0, 1, 8	1, 2, 7, 8	1 ,2
July	158	9	3	0	6	14	1, 8	1, 7, 8	7
August	498	38	15	4	26	59	0, 1, 8, 99	1, 2, 4, 7, 8, 88	1, 2, 4, 7, 10, 99

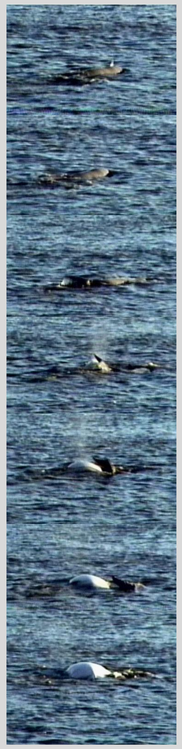
Activity Codes: 0-Unknown 1-Traveling/Moving 2-Diving 3-Mating 4-Spyhopping 5-Breaching 6-Feeding Observed 7-Feeding Suspected 8-Milling 9-Startled Effect 10-Tail Slapping 11-Avoiding Predation 12- Calving 13-Abrupt Dive 14-Disperse 99-Other

•Reported totals of white, gray, dk. gray, and unknown whales reflect the maximum number reported over all groups during the month. Relative numbers of each color class may change from scan to scan based on whales in view, lighting conditions, or distance from the camera. It is important to note that the total number of whales reported reflects the maximum number of whales recorded during that month and may NOT be equal to the sum of the color classes.

Behaviors by Spatial Distribution



Spatial distribution of sightings of beluga whale groups engaged in feeding suspected, diving, and other behaviors of interest in May – August 2011 with an inset of the relative position of the study area within Upper Cook Inlet. A sighting is defined as the presence of beluga whales during the duration of a single scan. Highlighted grid cells represent locations where beluga whale groups were observed engaged in diving behavior. Color scale indicates total number of sightings in each grid cell during 2011.

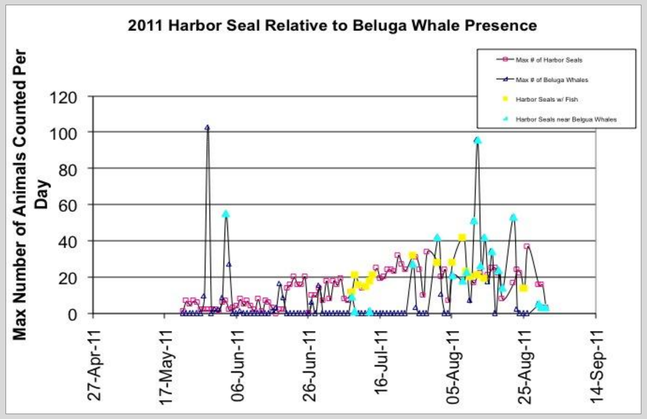


Beluga mother & neonate: Mother seems to be pushing baby to surface.

Beluga Whale and Harbor Seal Presence

•Harbor seals were seen feeding on fish within a meter of belugas.

•There was an increase in harbor seal numbers about two weeks before an increase in beluga whale numbers



Conclusions

Remote video monitoring can be a useful tool for capturing and observing beluga whale behavior.

•Cameras could be left on at night to capture video when observers were not present in the office.

•With no physical disturbance to belugas, cameras were able to capture extreme close-ups of individual whales, newborn calves, and behaviors.

•The ability to review video for data collection and validation purposes, results in a more accurate dataset than could be captured in real-time.

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