

Summary of spatial, temporal, demographic, and behavioral characteristics of groups of Cook Inlet beluga whales (*Delphinapterus leucas*) encountered during photo-id surveys conducted 2005-2016.

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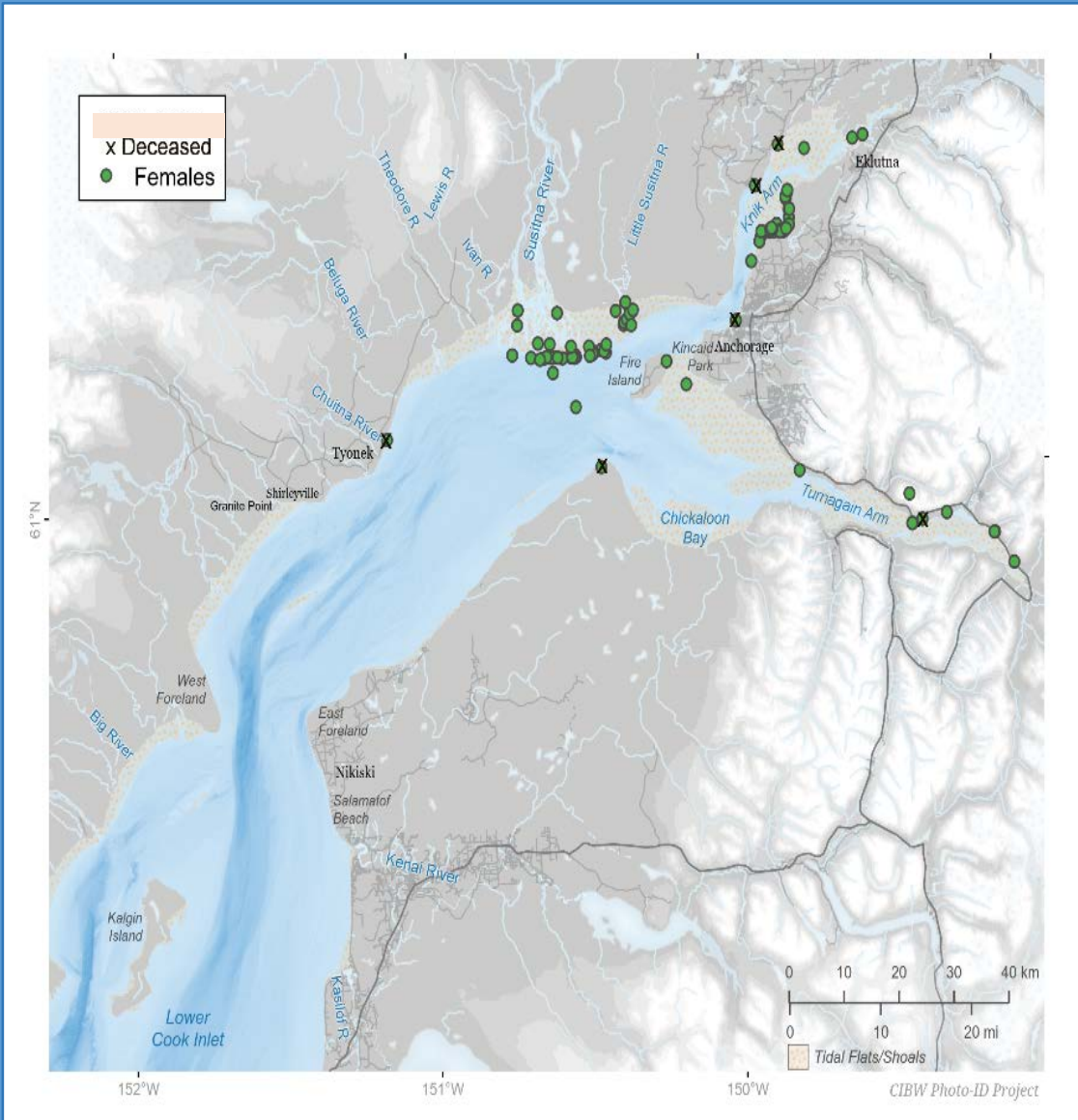
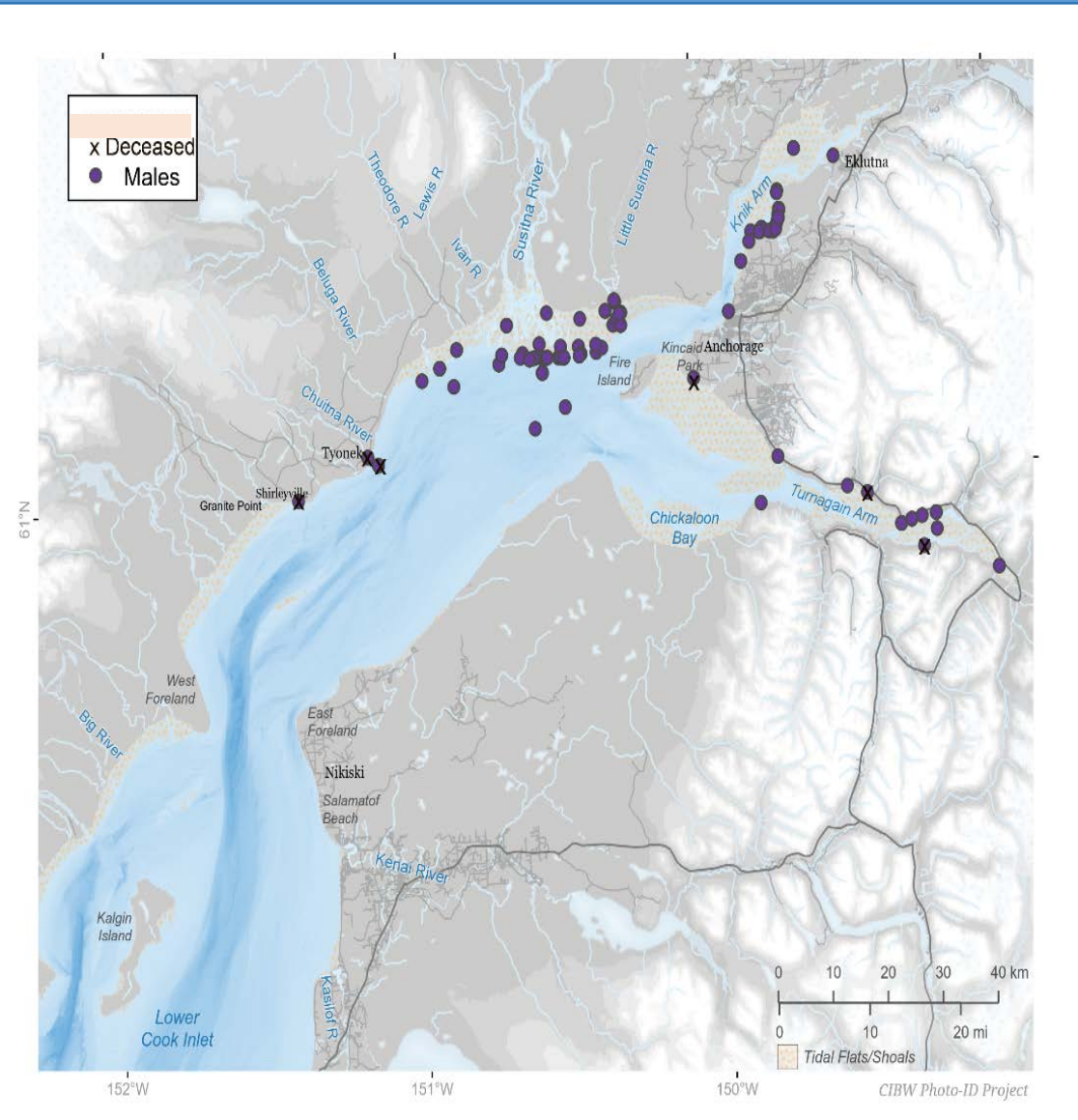


Here we summarize 12 years of sighting information (month, location, size, color/sex/age-class composition, and observations of feeding behavior) for 551 groups encountered during 421 photo-id surveys of Alaska’s endangered Cook Inlet beluga whale (CIBW) population (*Delphinapterus leucas*).

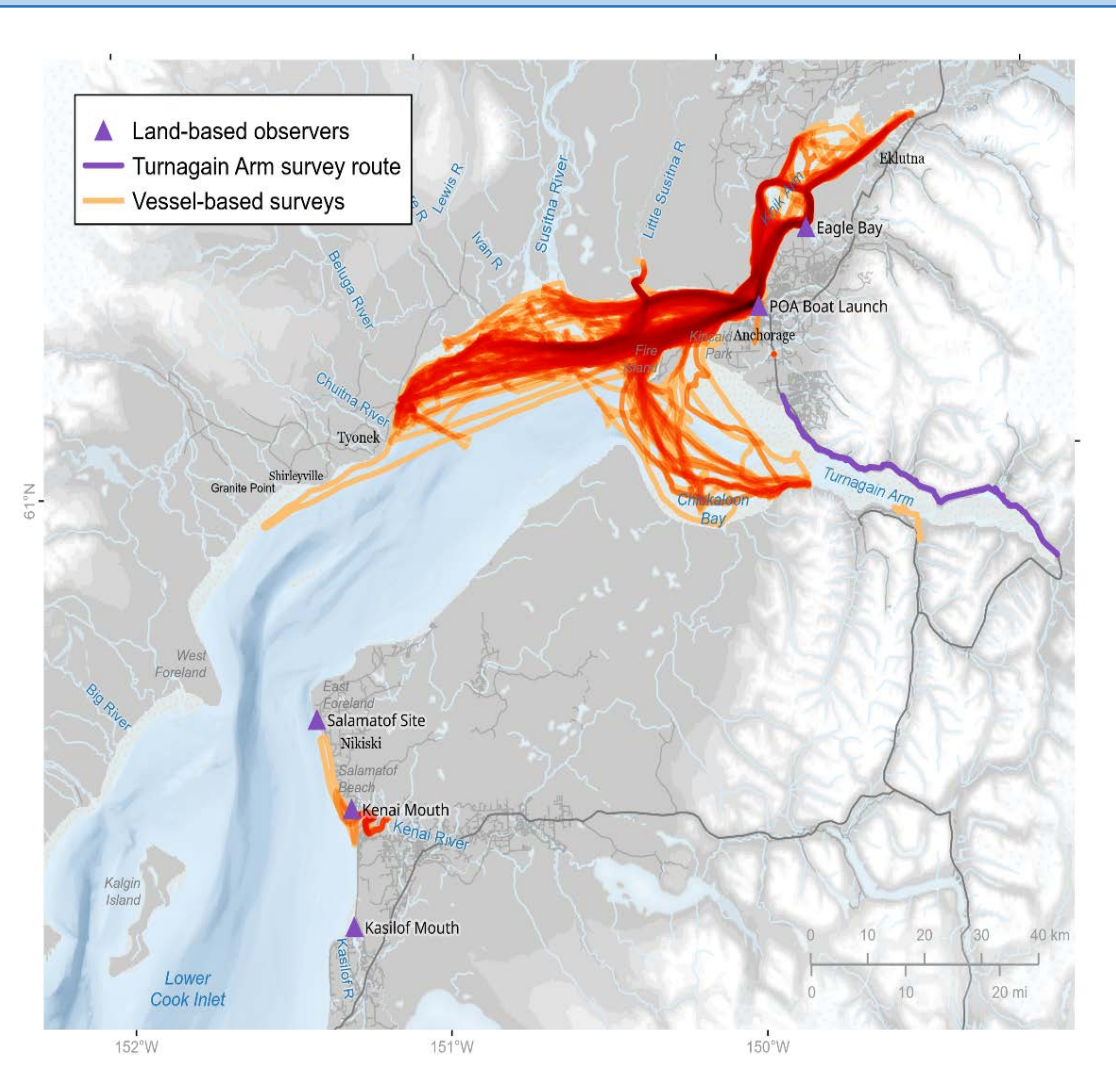
Results are presented as maps to assist managers in evaluating seasonal/area restrictions for mitigation, monitoring, and permitting purposes of human activities with the potential to affect CIBWs or their habitat.

Data were collected by the CIBW Photo-ID Project during vessel- and shore-based surveys April through October 2005-2016 in Cook Inlet. Most of the effort was concentrated in the Susitna River Delta, Knik Arm, and Turnagain Arm, with some effort in the Kenai River Delta and Chickaloon Bay/Fire Island.

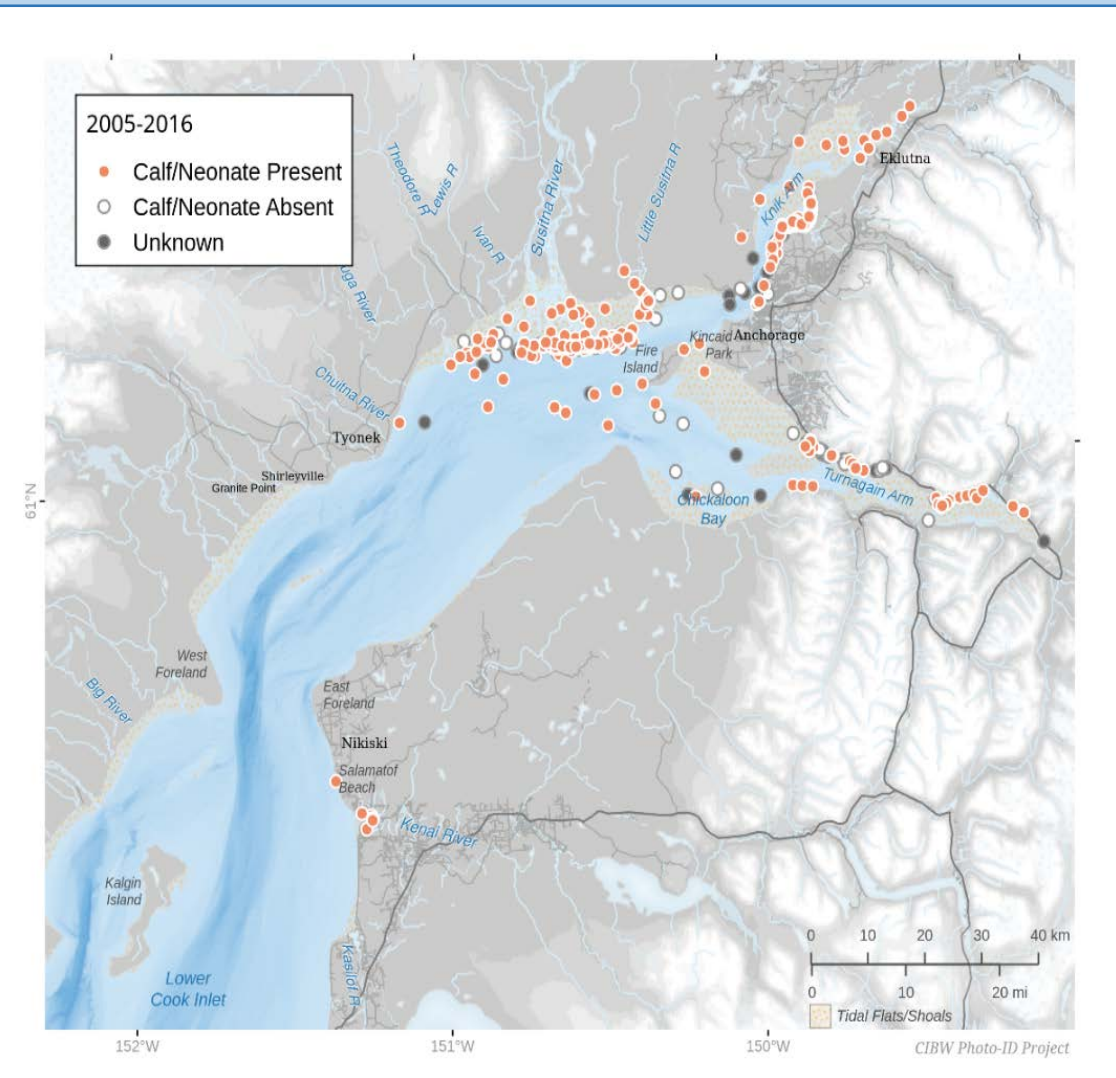
- In each of the field seasons, the largest group encountered annually occurred in the Susitna River Delta during a 2.5-week period between mid-July and early August.
- Maximum group size has been increasing in recent years; groups of 200 or more individuals were first seen in 2012 and the maximum group of 313 whales was seen in 2015. Maximum group size in 2016 returned to levels seen in 2005-2011.
- Most groups encountered consisted of a mix of white belugas, gray belugas, and calves/neonates, although the relative percentage of each varied by year, month, and area.
- Data from known-sex individuals showed little difference between the sexes in terms of the groups and areas in which they were sighted.
- Calves were seen in all areas, months, and years surveyed.
- The first neonate sighting each year was in the Susitna River Delta between early July and early August. Neonates were seen as late as mid-October, and in all areas surveyed.
- Feeding behavior was observed in most of the areas in which groups were encountered.
- Beluga groups were not distributed uniformly throughout the study area, but were instead associated with river mouths and channels connecting them, with strong tidal and seasonal patterns to their distribution and movements.
- The distinct areas where belugas are found seasonally, corridors connecting them, and “hotspots” of special biological significance (e.g., feeding, calving/calf rearing) should warrant concerted management and protection.



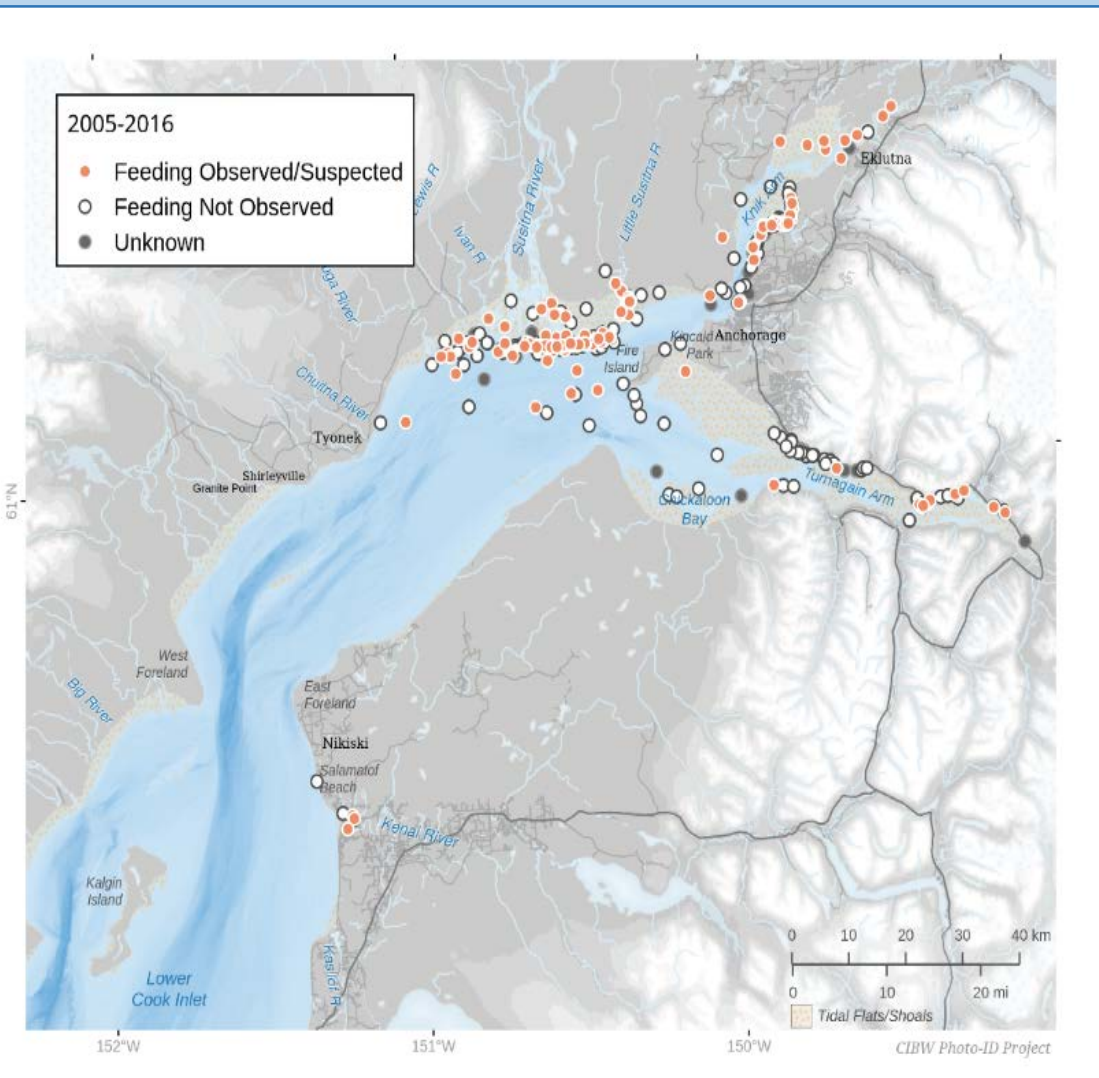
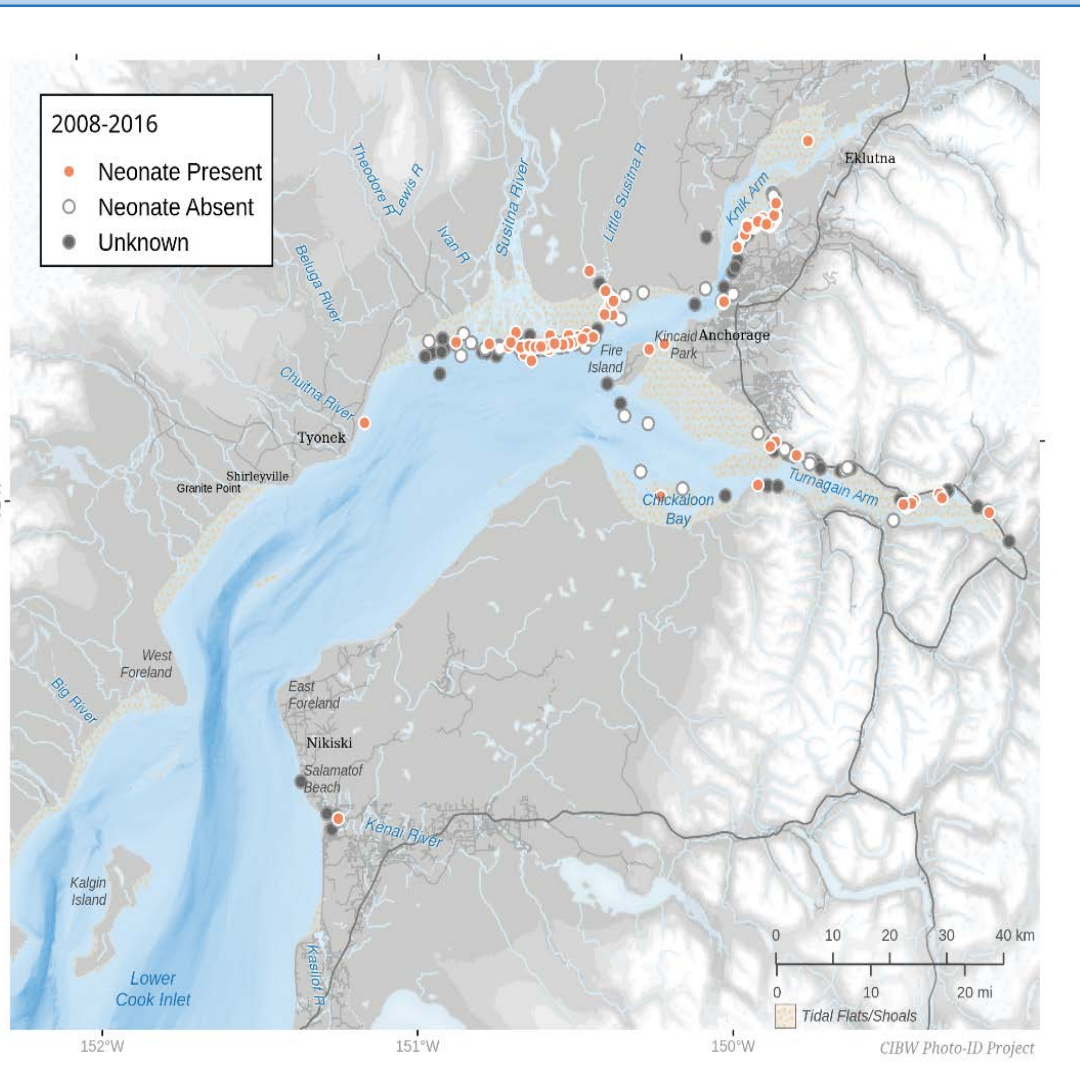
Locations of all males (n=8; map on left) and all females (n=14; map on right) photographed during the 2005-2016 photo-id surveys. Sex was determined from genetic samples obtained during strandings, capture for satellite tagging, remote skin/blubber biopsy, and/or physical examination during necropsy.



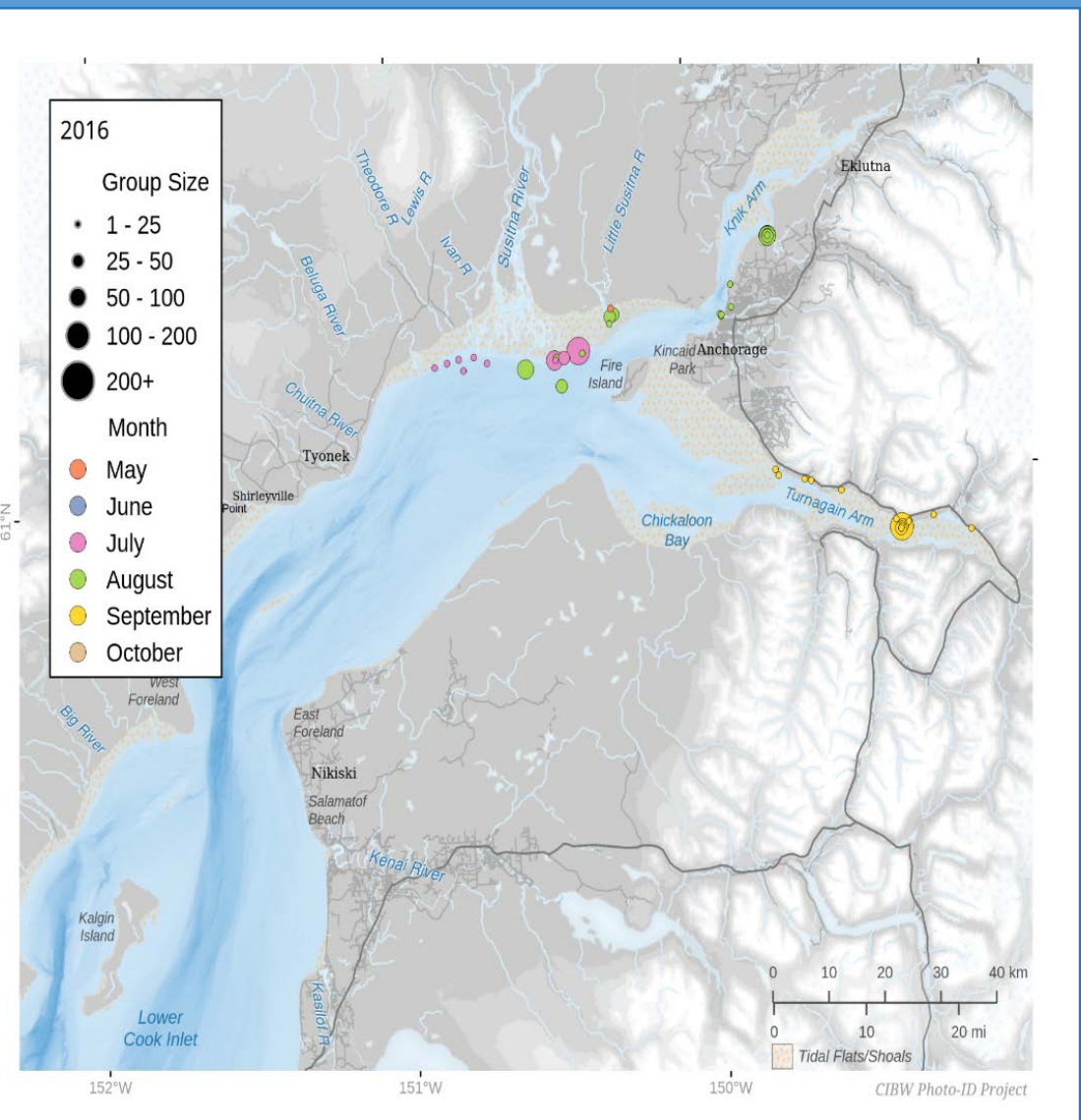
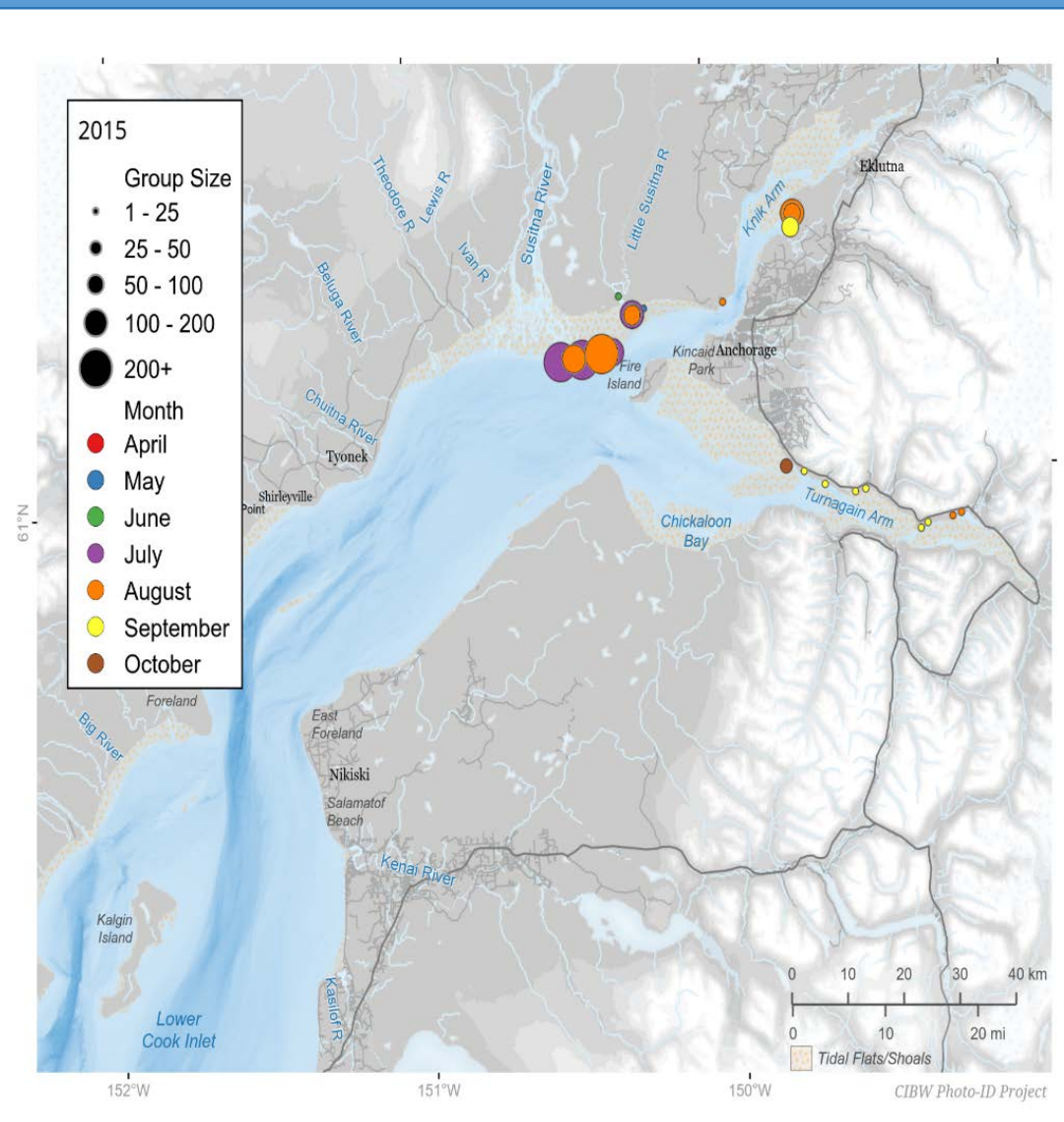
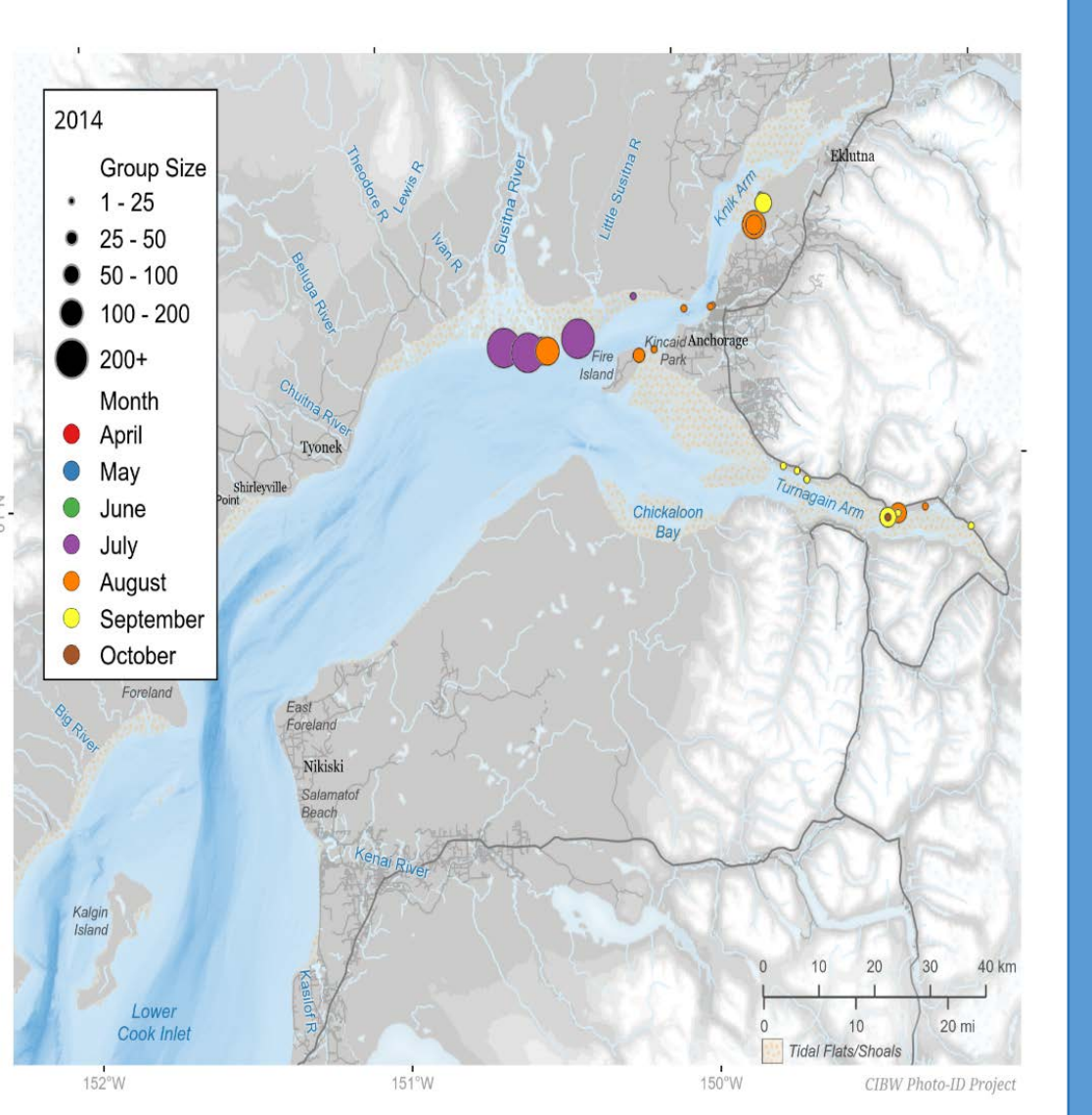
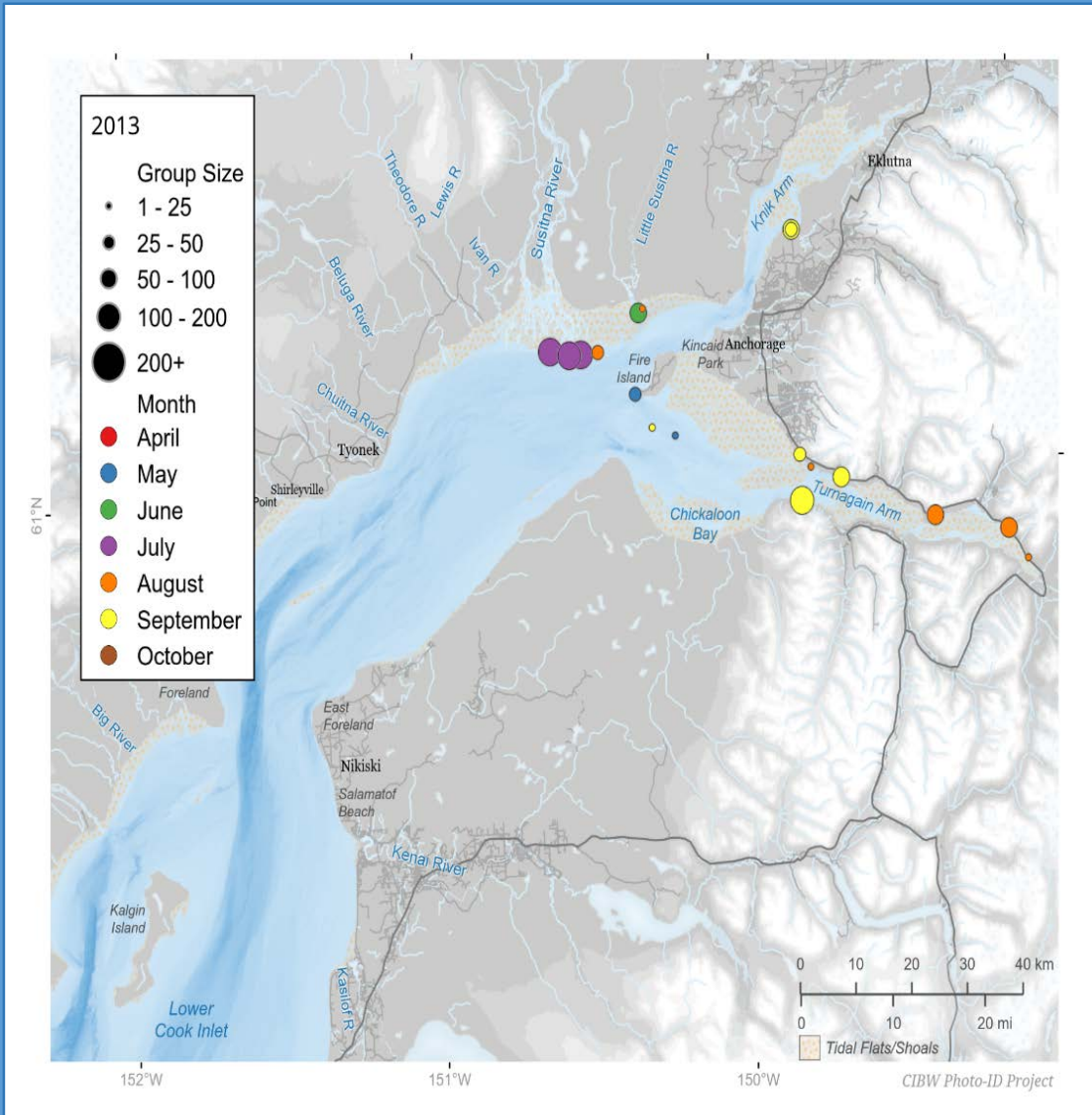
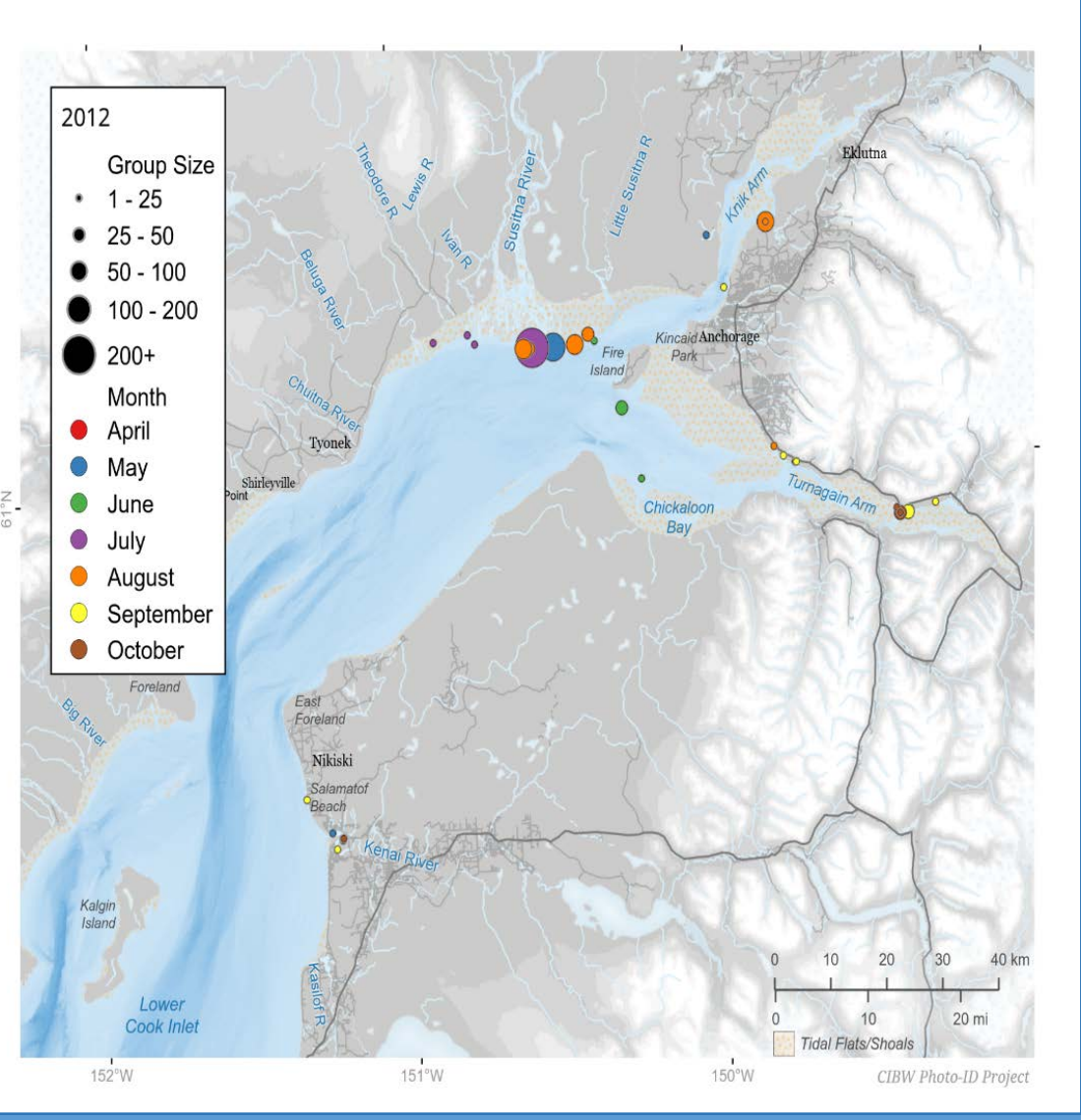
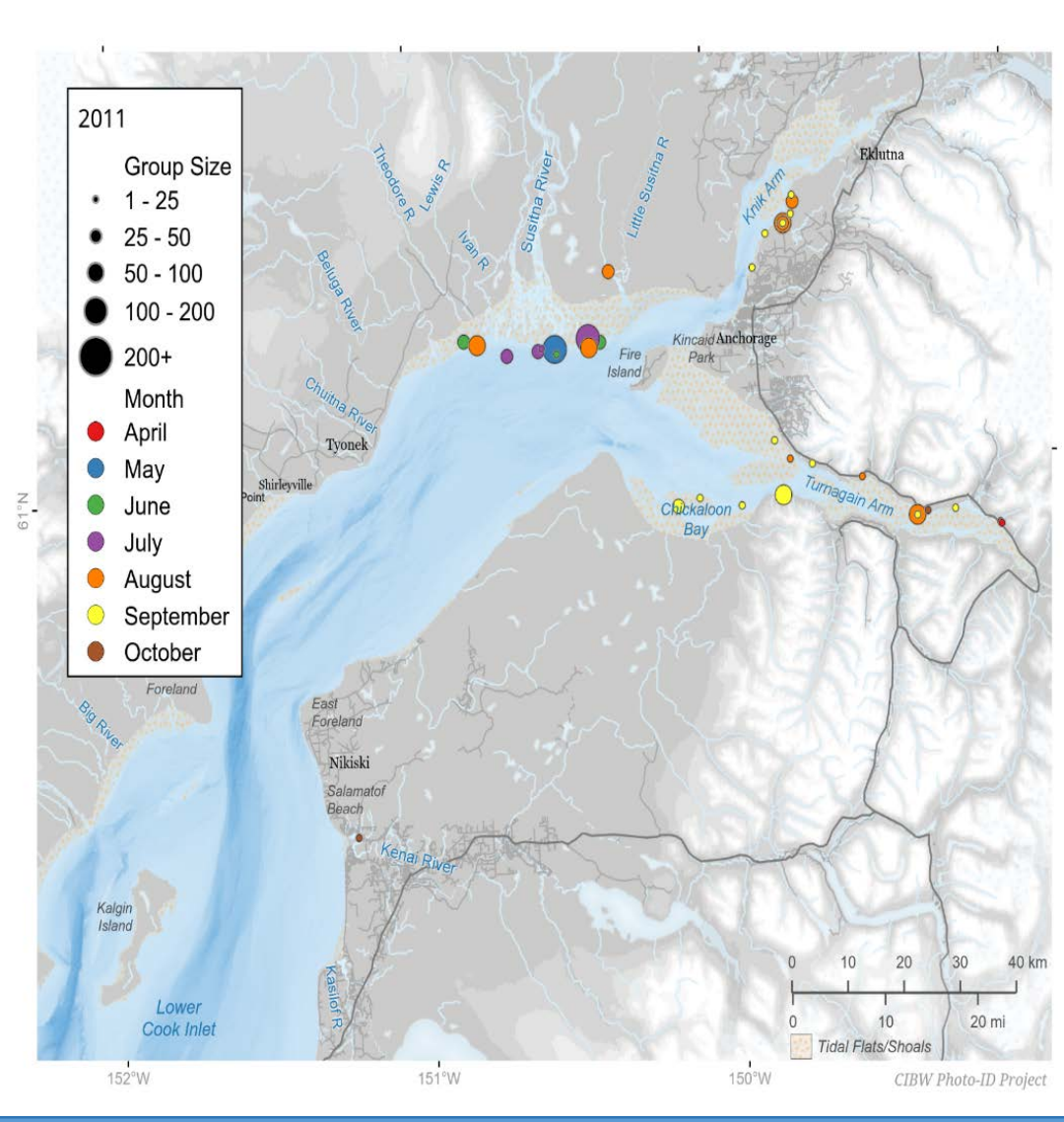
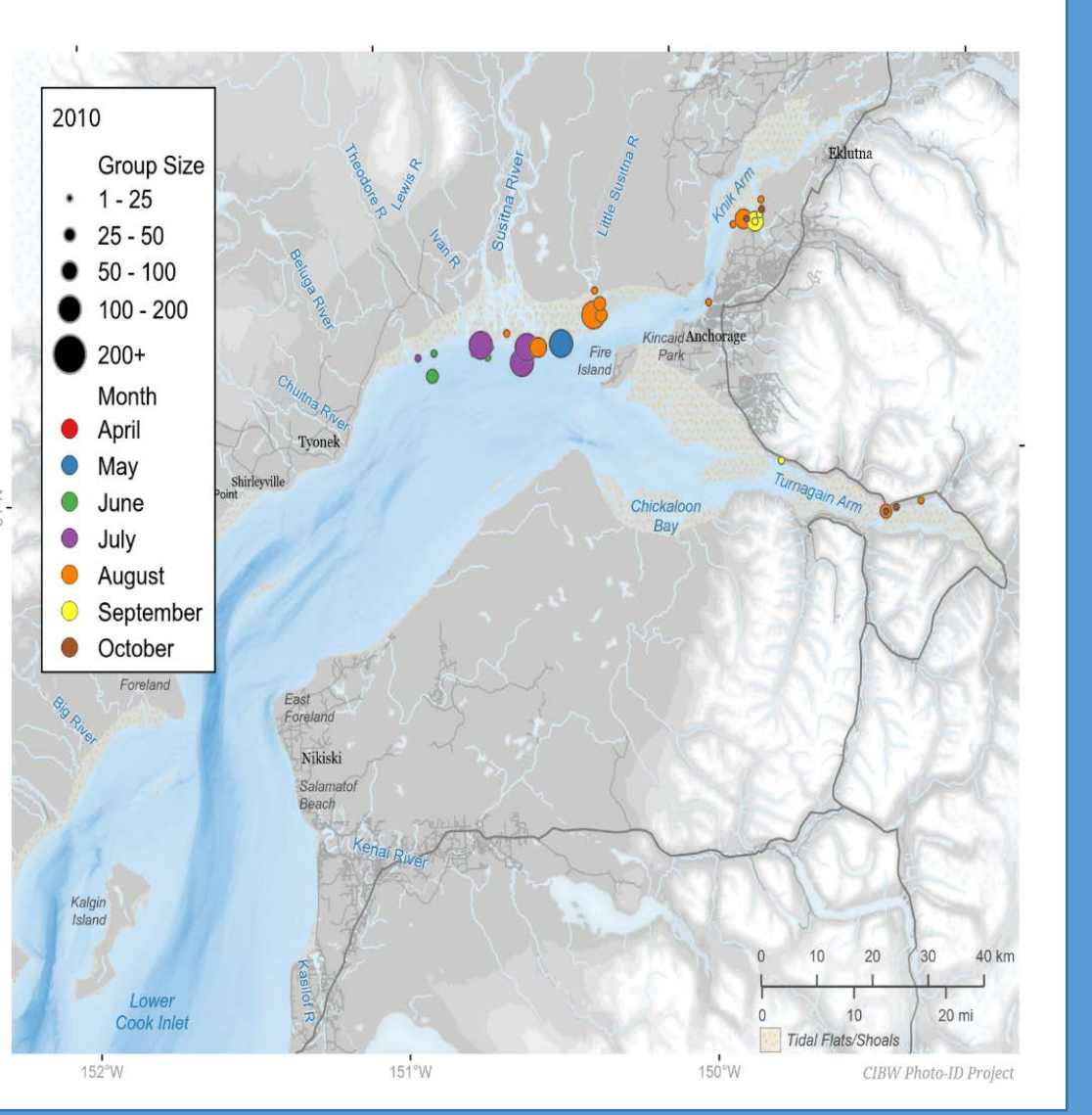
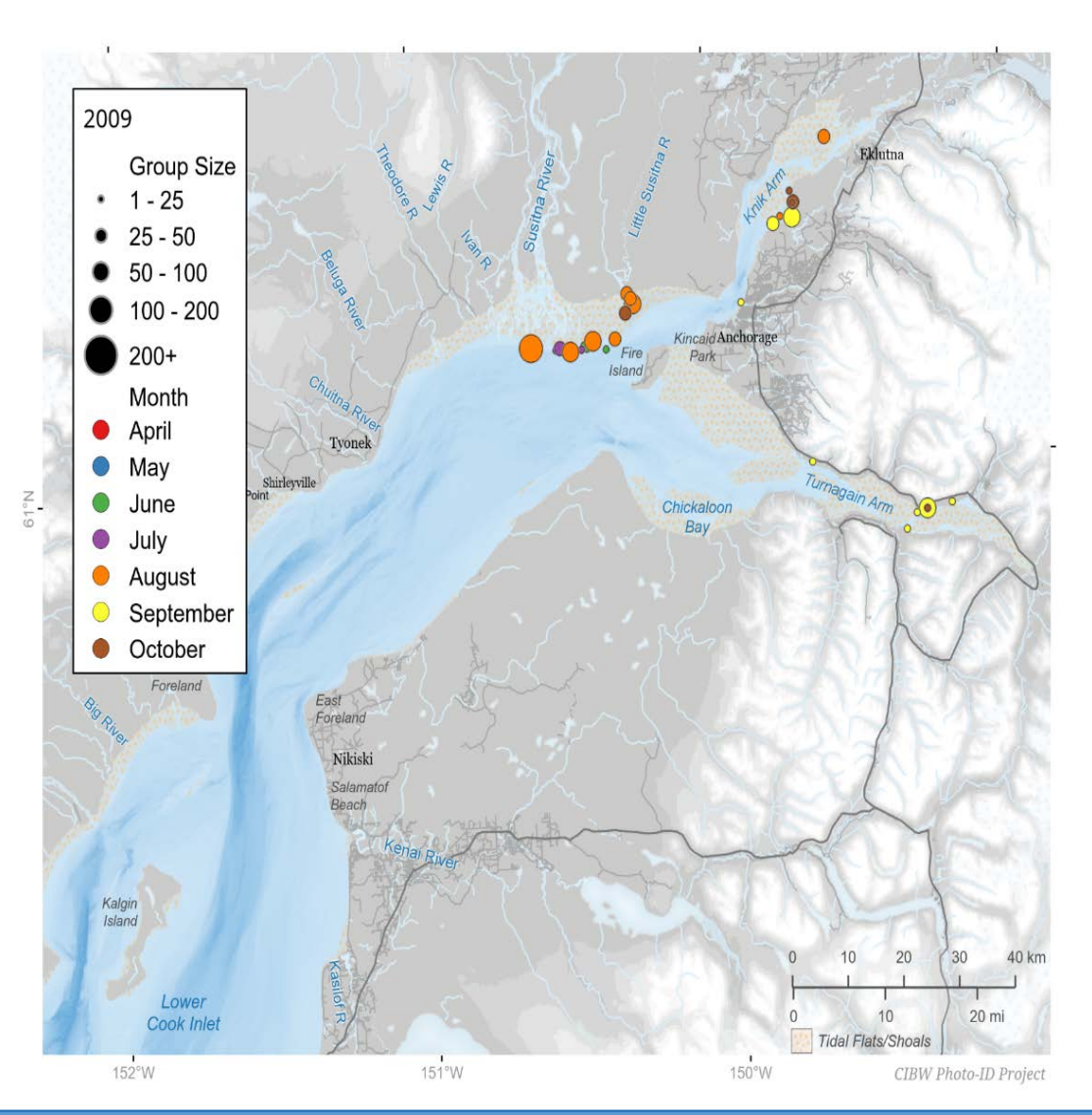
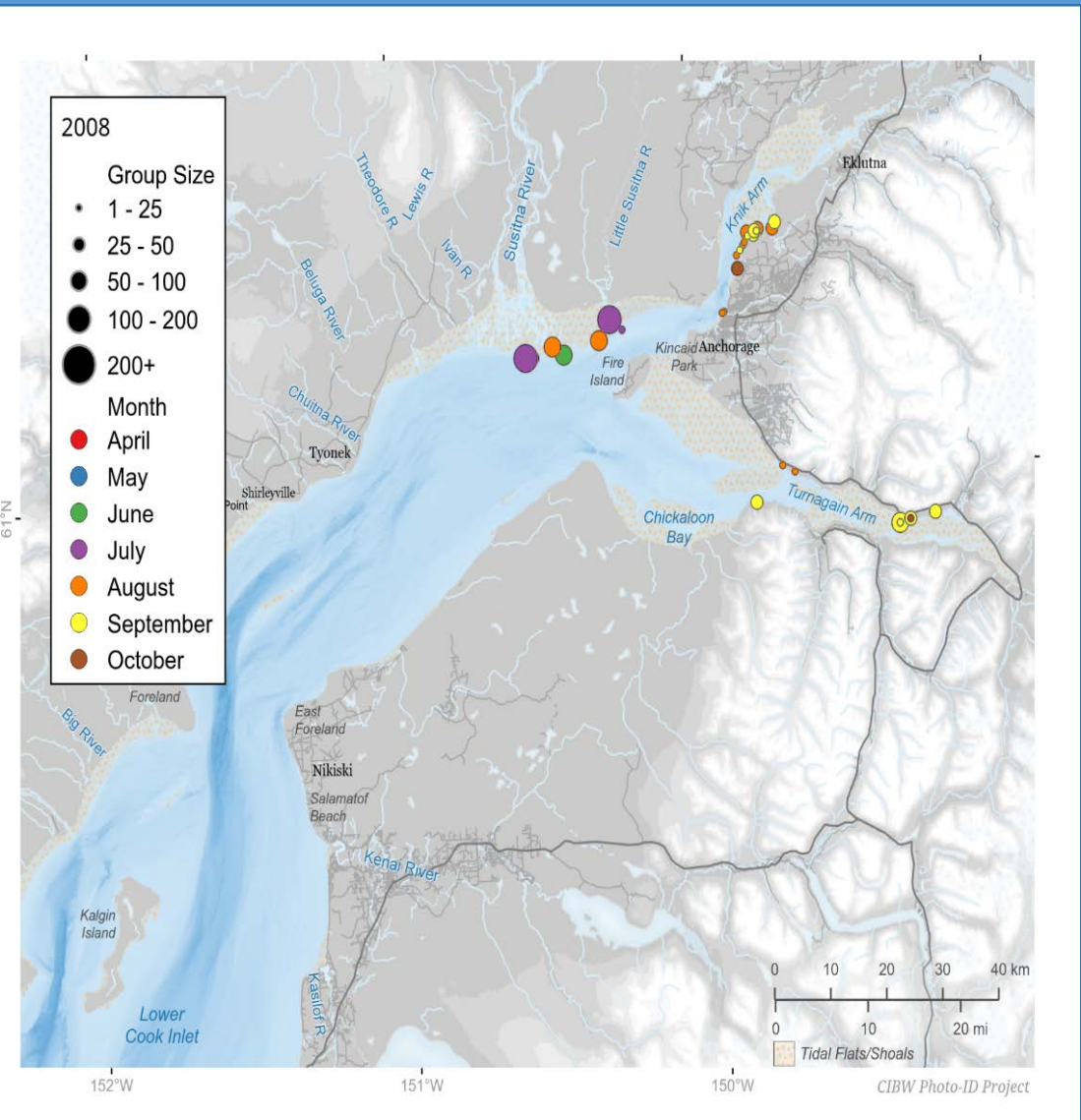
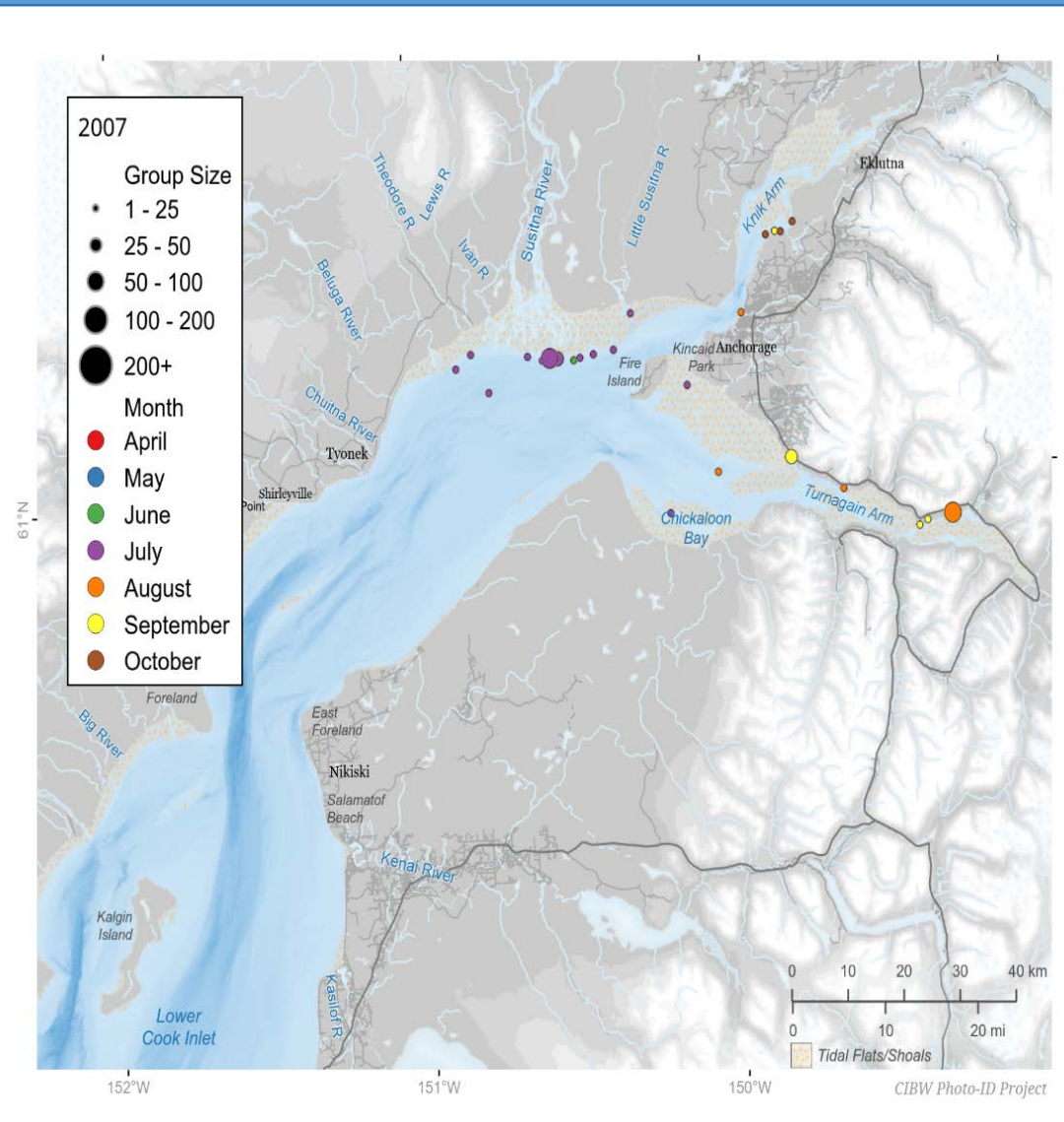
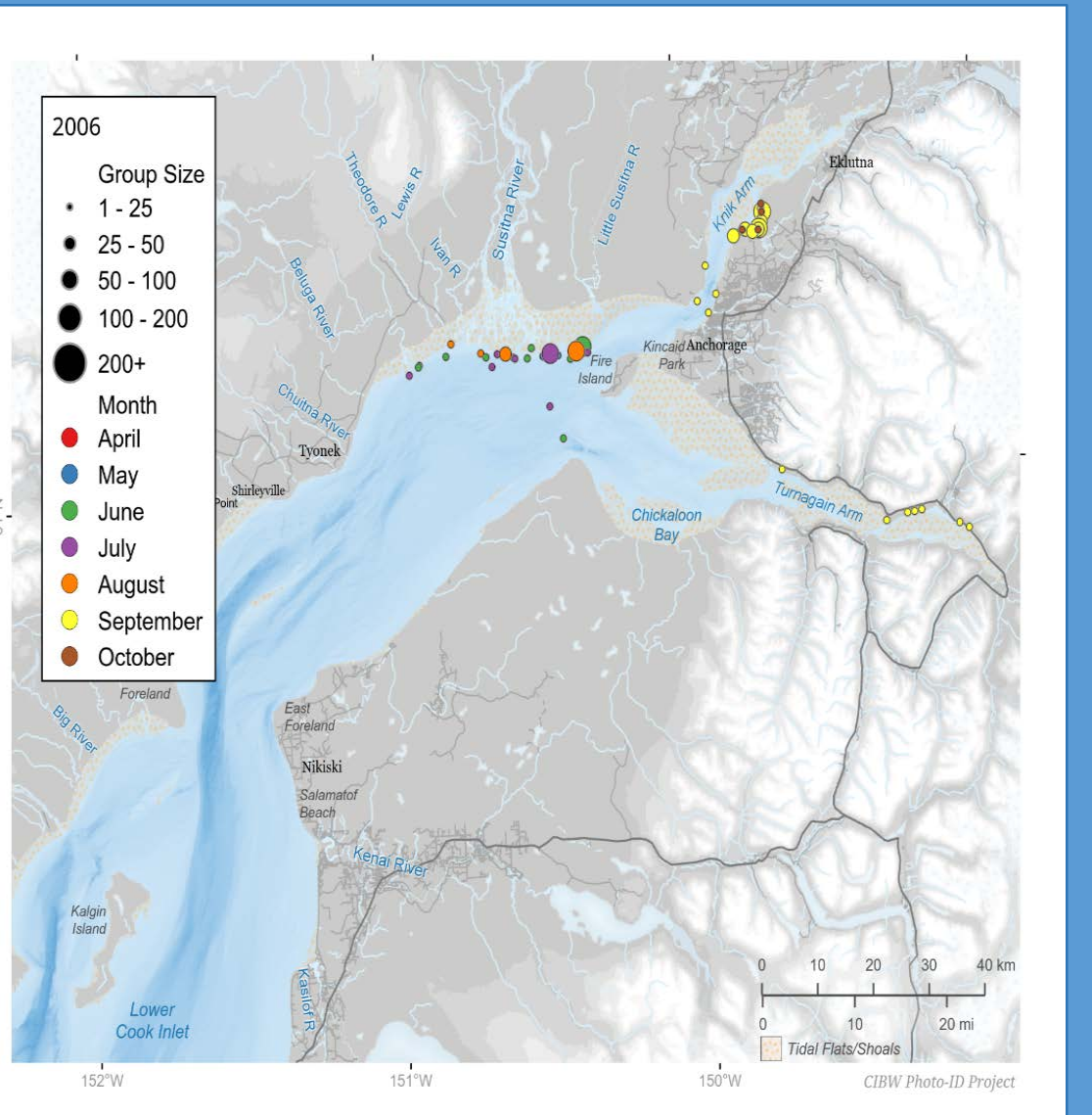
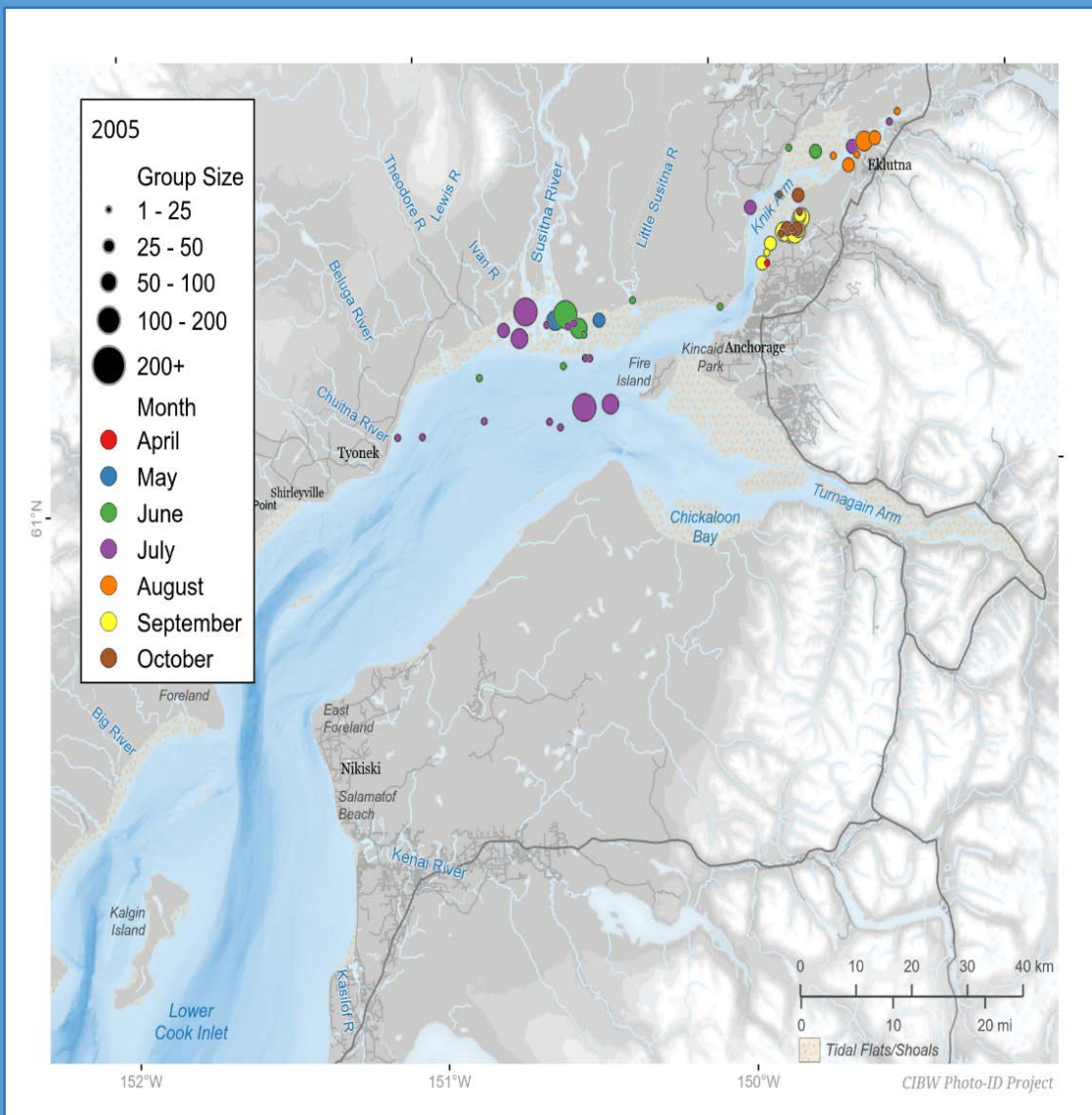
Vessel routes and land-based stations for all photo-id surveys conducted 2005-2016. Level of effort of the vessel-based surveys is indicated by the intensity of the colors of the track lines.



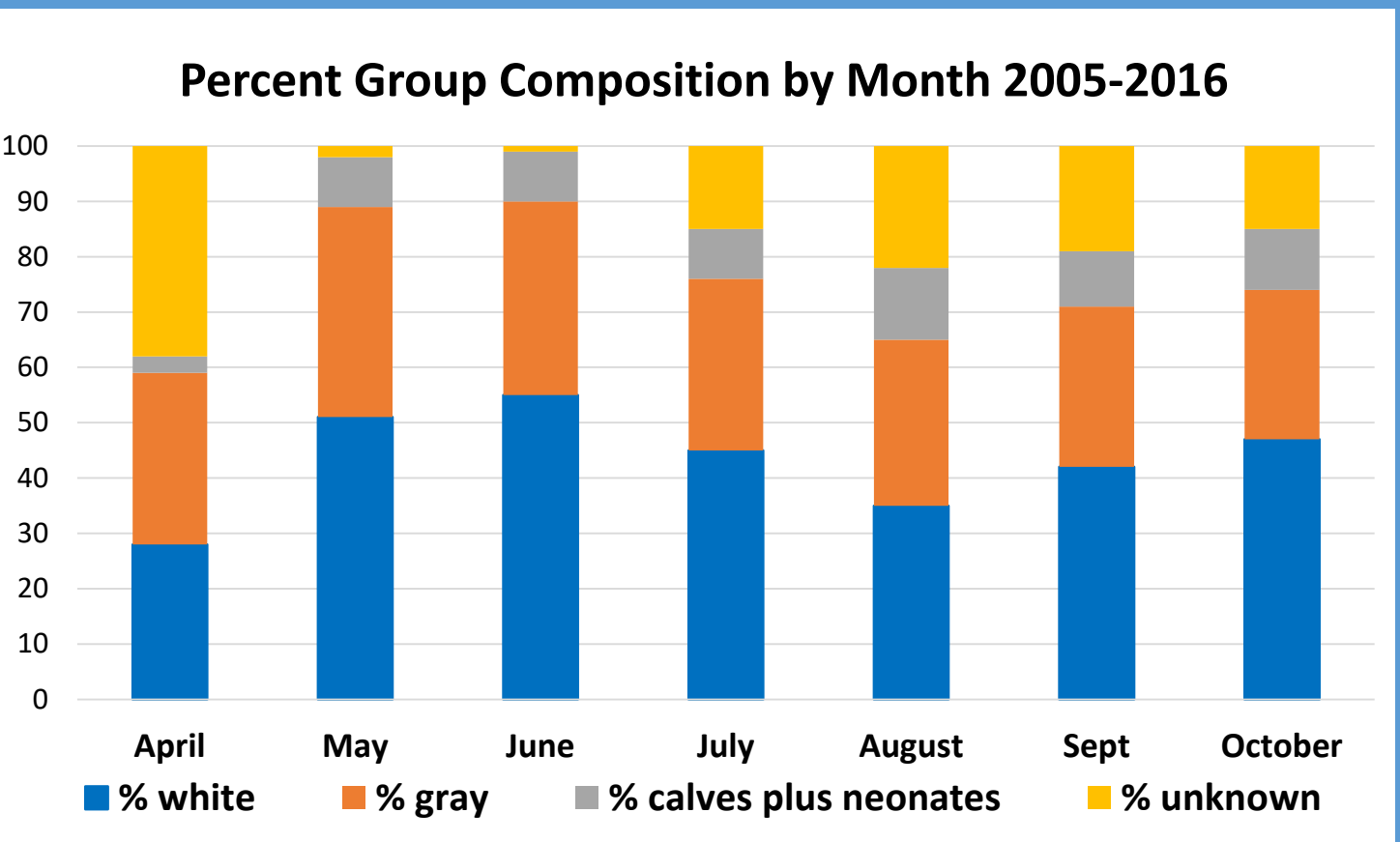
Location of groups with and without calves and/or neonates encountered during photo-id surveys conducted 2005-2016. Neonates were not differentiated from calves during the 2005-2007 surveys, but neonates were noted if visible in photos.



Location of groups with and without observations of feeding behavior (suspected or confirmed) during photo-id surveys conducted 2005-2016.



Size, month, and location of beluga whale groups encountered during photo-id surveys conducted 2005-2016.



Mean group percent color and age-class composition, by month, for belugas encountered during photo-id surveys 2005-2016 (n=551 groups). For example, the average group in April contained 28% white belugas, 31% gray belugas, 3% calves/neonates, and 38% unknown.

Summary of annual range of neonate sightings and maximum group size of beluga whale groups encountered during photo-id surveys 2005-2016. In every year, the first neonates of the season and the largest group of the season were encountered in the Susitna River Delta.

Year	Field season	First neonate sighting	Last neonate sighting	Date of largest group of year	Maximum Group Size
2005*	April 14-Oct 21	July 6	n/a	July 23	152
2006*	May 12-Oct 5	n/a	n/a	July 26	61
2007*	June 28-Oct 27	July 27	n/a	July 27	74
2008	May 21-Oct 28	July 24	Sept 30	July 29	121
2009	June 19-Oct 24	Aug 1	Oct 15	Aug 3	152
2010	May 9-Oct 15	July 16	Oct 8	July 16	173
2011	April 16-Oct 22	July 27	Sept 27	July 27	136
2012	May 2-Oct 21	July 20	Oct 4	July 20	200
2013	April 20-Sept 21	July 31	Sept 3	July 22 & July 31	200
2014	July 8-Oct 3	July 21	Oct 3**	July 27	250
2015	May 28-Oct 1	July 19	Oct 1**	July 20	313
2016	May 24-Sept 30	July 15	Sept 30	July 19	148

*Neonates were not differentiated from calves during the 2005-2007 surveys, but neonates were noted if visible in photos. ** Last day of field season