

Walrus tracking and telemetry data acquired from walrus instrumented on the Alaska shores of the Chuckchi Sea in September 2009.

Radio-Tagging Field Report

USGS Alaska Science Center, Walrus Research Project

Background:

The vast majority of female and young Pacific walrus summer in the Chukchi Sea. In 2007 and again in 2009 walrus formed large coastal haulouts on the Alaskan shores of the Chukchi Sea when sea ice disappeared over the Chukchi Sea continental shelf waters. To understand the consequences of hauling out on land versus hauling out on sea ice in the Chukchi Sea, USGS has begun a study to gather tracking and foraging data from walrus using coastal haulouts. Results of the study will provide the public, subsistence users, and managers with a greater understanding of walrus habitat use patterns in the Chukchi Sea.

Methods:

Between 2009 September 14 and 19, researchers attached satellite radio-tags to 15 walrus as they rested on barrier island beaches near Icy Cape and the village of Point Lay. From Point Lay we worked with a local boat operator to access walrus groups on barrier islands. From Wainwright we worked with a light helicopter (Robinson 44) to access barrier islands near Icy Cape. We approached walrus groups by crawling across sandy beaches from downwind and deployed radio-tags with crossbows (Jay et al 2006). We deployed three models of radio tags: a location only tag and two models that collected chronologies of hourly haulout and foraging behavior. The "location-only" tags (Wildlife Computers Spot model, Seattle, Washington) were fit with a lightweight "butterfly" sub-dermal anchor produced by Mikkel Jensen (Denmark). We used two models of behavior monitoring tags: the LPT-125 and the LPT-145, both manufactured by Telonics (Meza, Arizona). All LPT-125 tags were fit with standard sub-dermal anchors. We fit the LPT-145 tags with both standard and experimentally augmented sub-dermal anchors. All Telonics LPT-125 radio tags were deployed on barrier islands near Point Lay, while all other radios were deployed near Icy Cape.

All radio tags signals used to estimate locations (Telonics LPT-125 manufactured by Telonics of Mesa, Arizona). Behavior monitoring tags included nearly 5 days of hourly behavior diary entries with each transmission. The Argos satellite data collection system provided records of transmissions received by polar orbiting satellites and estimated geographic locations of tagged walrus based on the transmission Doppler shifts recorded by instruments onboard satellites receiving the transmission signal (Argos 2007). Because locations derived from Doppler shift data suffer variable inaccuracies, we filtered locations with a plausibility test based on reported quality of the location estimate, the nominal maximum walrus swim speed, spatial redundancy, and turn angles (see Udevitz et al 2009 for details).

Results:

Of the 15 deployed radios, 13 returned walrus tracking data through the satellite data collection system (Table 1). Two of the 4 LPT-145 radio tags fit with experimental anchors failed shortly after deployment. Tracking data revealed the path of tagged walruses (Figure 1). Duration of deployments varied with radio model and anchor type (Table 1). Walruses tagged near Icy Cape traveled to Ledyard Bay (near Cape Lisburne) to rest, before traveling across open water to Russia. Walruses tagged near Point Lay foraged and rested near the deployment location, before traveling to the south and then west to Russia. Walruses tracked to Russia foraged from a coastal haulout within 125 km of shore. The tags acquired 397 walrus-days of behavioral data.

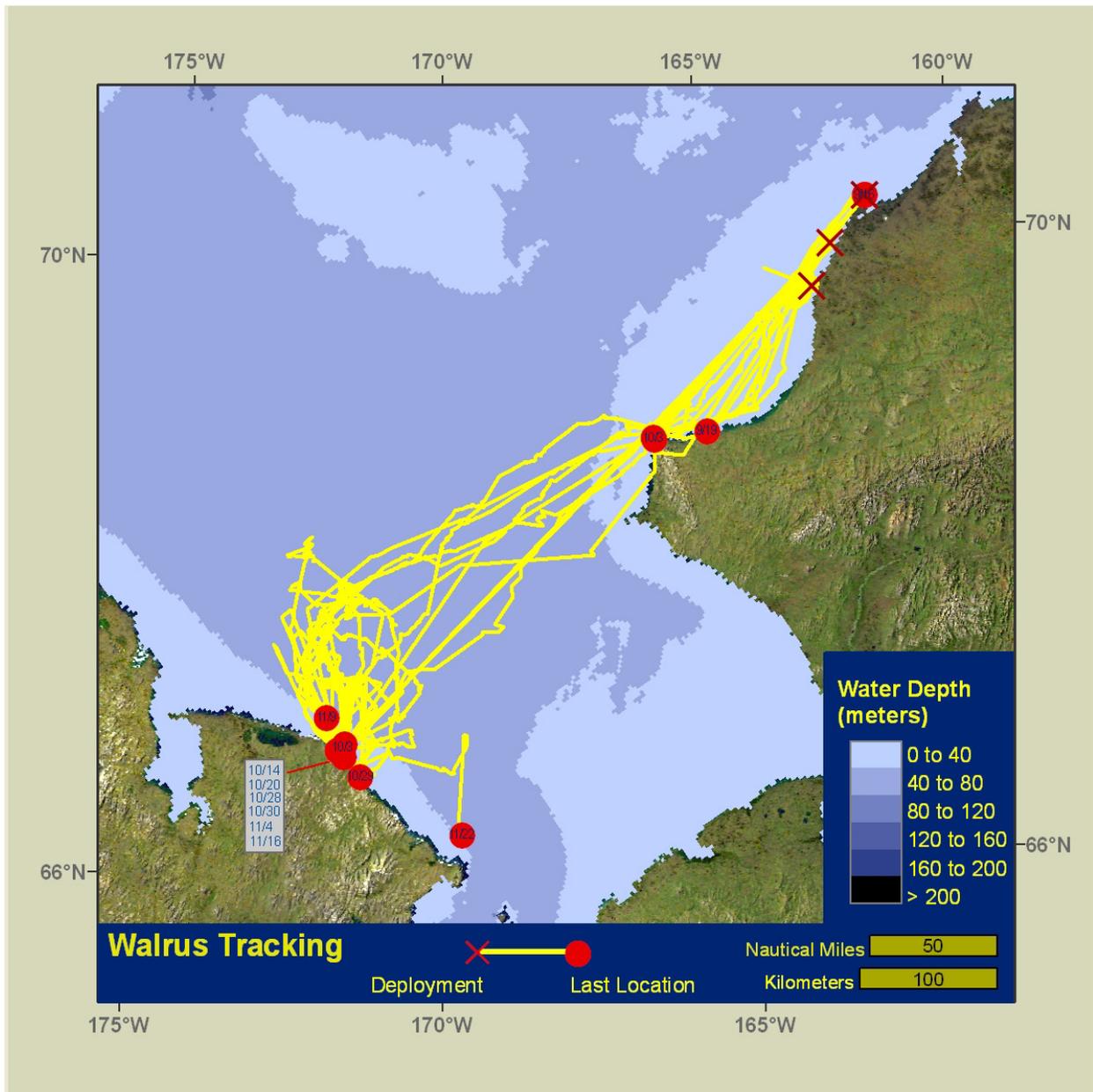


Figure 1. Tracks of walrus instrumented on the Alaska shores of the Chukchi Sea in September 2009.

Table 1. Summary of data acquired by satellite-linked radio tags deployed on walrus instrumented on the Alaska shores of the Chuckchi Sea in September 2009.

Radio Model	Sub-Dermal Anchor	Number of Deployments	Data Collection	Days of Tracking Data (Mean and Standard Error)	Locations per day (Mean and Standard Error)
Telonics LPT-125	Standard	6	Tracking Hourly haulout and forage behavior	48.3 (9.0) range: 33.9 – 66.1	10.5 (3.8)
Telonics LPT-145	Standard	4	Tracking Hourly haulout and forage behavior	31.8 (19.5) Range: 15.7 – 61.0	6.0 (6.9)
Telonics LPT-145	Experimental	4	Tracking Hourly haulout and forage behavior	4.2 (6.6) range: 0 = 14.1	1.1 (1.32)
Wildlife Computer Spot	Jensen Butterfly	1	Tracking	42.2	1.7 (-)

References

- Argos. 2007. Argos User's Manual. Collecte Localisation Satellites. Argos, Saint-Agne, France.
- Jay, C. V., M. P. Heide-Jorgensen, et al. 2006. Comparison of remotely deployed satellite radio transmitters on walrus. *Marine Mammal Science* 22(1): 226-236.
- Udevitz, M. S., C. V. Jay, et al. 2009. Modeling Haul-out Behavior of Walrus in Bering Sea Ice. *Canadian Journal of Zoology* 87: 1111-1128.