

Walrus tracking and telemetry data acquired from walrus instrumented on ice in the eastern Chukchi Sea in summer of 2007

Radio-Tagging Field Report

USGS Alaska Science Center, Walrus Research Project

Background:

The distribution of adult female and young walrus in the Chukchi Sea in summer has been generally associated with the ice edge. Walrus forage on benthic invertebrates on the continental shelf and use sea ice to haul out and rest between foraging trips. Ice-free conditions, as indicated by passive microwave imagery, occurred over the Chukchi Sea shelf in 7 of the last 12 years (1998-2009), but only once in the previous 19 years (1979-97). To determine how walrus may distribute themselves when the ice edge retreats off the continental shelf and over the deep Arctic Basin, we attached satellite radio-tags to walrus in the eastern Chukchi Sea near Barrow, Alaska. 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:

With the help of the North Slope Borough Department of Wildlife Management, we approached walrus groups on sea ice with boats launched from shore near Barrow, Alaska. On June 22 and July 3, 2009 we attached satellite radio-tags to 11 walrus as they rested on sea ice south west of Barrow within 60 km of shore. All radio tags transmitted 30-minute haulout behavior chronologies and signals that may be received by polar orbiting satellites and used to estimate locations (Telonics ST-24, Meza, Arizona) and were fit with standard sub-dermal anchors (Jay et al 2006). 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 polar orbiting satellites (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 11 tags deployed, 9 produced data through the satellite data collection system (Table 1). Tracking data revealed the path of tagged walrus (Figure 1).

Figure 1. Tracks of walrus instrumented on ice in the eastern Chukchi Sea in summer of 2007.

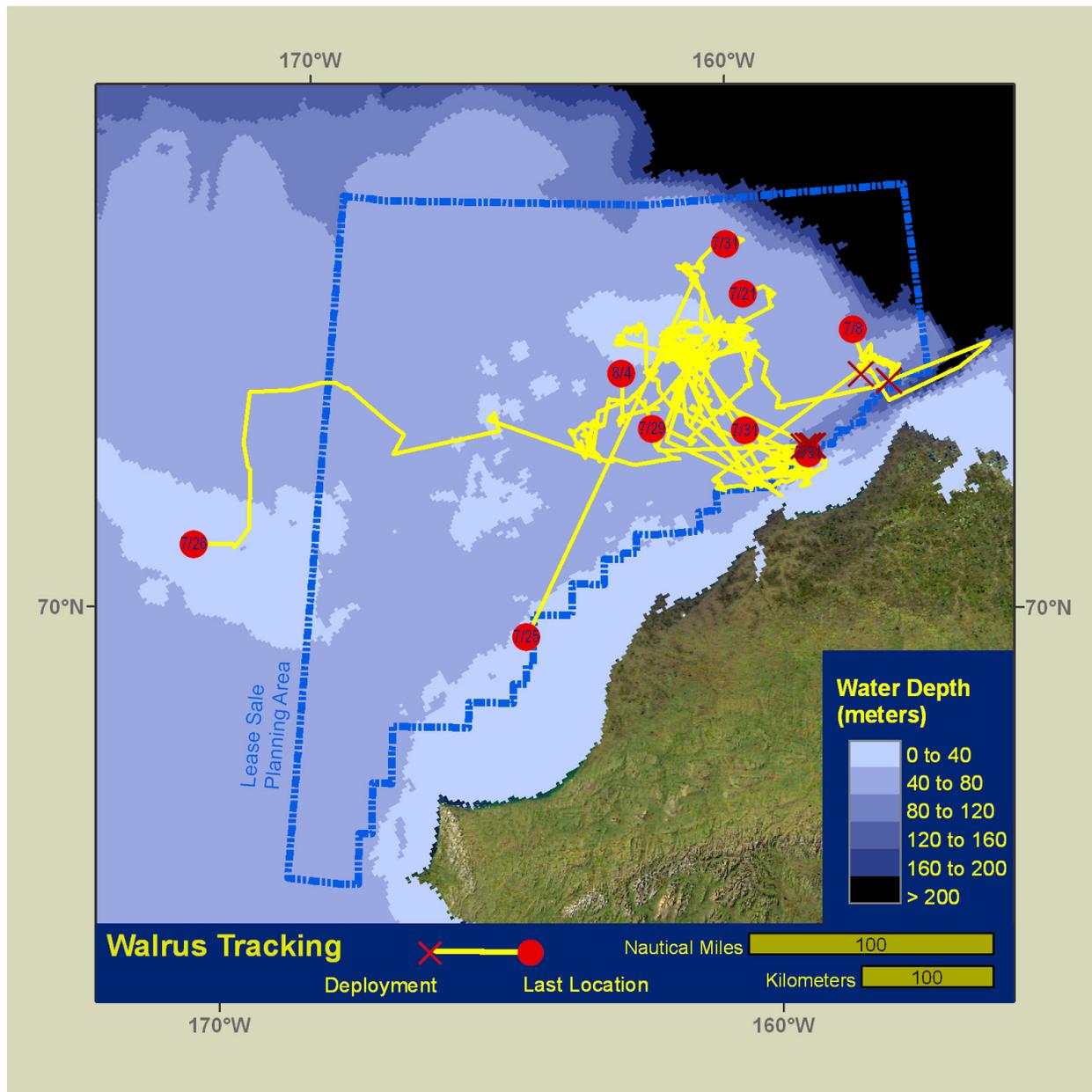


Table 1. Summary of data acquired by satellite-linked radio tags deployed on walrus on eastern Chukchi Sea ice in the summer of 2007.

Radio Model	Deployments	Data Collection	Mean Duration of Tracking Data Mean and (Standard Error)	Locations per day Mean and (Standard Error)
Telonics ST-24	11	Tracking Haulout behavior	23.7 (9.3) d range 0 – 41 d	7.4 (6.0)

References

- Argos. 2007. Argos User's Manual. Collecte Localisation Satellites. Argos, Saint-Agne, France.
- Jay, C. V., M. P. Heide-Jorgensen, A. S. Fischbach, M. V. Jensen, D. F. Tessler, and A. V. Jensen, 2006. Comparison of remotely deployed satellite radio transmitters on walruses. *Marine Mammal Science* 22:226-236.
- Udevitz, M. S., C. V. Jay, A. S. Fischbach, and J. L. Garlich-Miller. 2009. Modeling Haul-out Behavior of Walruses in Bering Sea Ice. *Canadian Journal of Zoology* 87:1111-1128.