

# Glacier Bay Harbor Seal Capture Trip Summary September 10-15, 2007

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A harbor seal capture trip was conducted from September 10-15, 2007 in Johns Hopkins Inlet on board the R/V *Steller*. The primary objectives of the capture trip were to (1) deploy satellite transmitters on juvenile female harbor seals to assess overwinter and spring movements, identify foraging locations in the spring, and supplement information for stock structure, and (2) collect biological samples to assess disease status and contaminant load. A total of 43 harbor seals were captured over four capture days including 15 pups (8M, 7F), 8 yearlings (4M, 4F), 15 subadults (7M, 7F), and 5 adults (2M, 3F) (Table 1).

### Overwinter Movements

To assess overwinter and spring movements, satellite tags (Spot 5, Wildlife Computers) were attached to fifteen juvenile females. The satellite tags were glued to the head (Figure 1) and programmed to transmit location data and haulout statistics (% of each day spent hauled out) every other day. Locations from each seal are received via System Argos, downloaded, and processed using the Douglas Argos-Filter Algorithm which ingests satellite tracking data and flags improbable locations based on user defined distance and velocity thresholds (Dave Douglas, USGS Alaska Science Center).

Although data are just starting to be collected, movements from these seals are striking. As of September 23, 2007, several of the tagged harbor seals had already moved to areas outside of Glacier Bay. One yearling female (PV07GB15) traveled from Johns Hopkins Inlet (JHI) to Icy Strait, between Spasski Bay and Whitestone Harbor (Figure 2). Another subadult female (PV07GB46) traveled from JHI to Point Althorp on September 17<sup>th</sup>, and then to West Chichagof between the Myriad Islands and Khaz Peninsula by September 23<sup>rd</sup> (Figure 3), an estimated travel distance of ~220 kilometers. A third subadult female (PV07GB48) was located near Lemesurier Island from 19-21 September, and by September 23 had traveled into the Gulf of Alaska just offshore of Dry Bay, an estimated travel distance from JHI of ~350 kilometers (Figure 4). A fourth subadult female (PV07GB10) was located in Icy Strait on September 21<sup>st</sup> and was in Lituya Bay by September 23<sup>rd</sup> (Figure 5). Other seals currently remain within Glacier Bay proper, although only one seal (PV07GB33) remains within Johns Hopkins Inlet. One subadult female (PV07GB08) was located near Wachusett Inlet on September 17<sup>th</sup> and 19<sup>th</sup>, and in McBride Inlet on September 23<sup>rd</sup> (Figure 6).

Understanding movements and migratory patterns of harbor seals during the non-breeding season are important for understanding overwinter habitat use, and spring time foraging locations, including those utilized prior to breeding. Identification of wintering grounds and seasonal movements, coupled with genetic data, will help solidify the framework for identification of harbor seal stock structure in Southeast Alaska.

The overwinter movement study is being carried out by Jamie Womble and Scott Gende (NPS) with support from Dave Douglas (USGS), Josh London (NMML),

Peter Boveng (NMML), and Alaska Department of Fish and Game (ADF&G). Funding for the overwinter movement study is provided by National Park Service -Natural Resource Preservation Program.

### Disease and Contaminants

To assess health and disease status of harbor seals we have partnered with Dr. Todd O'Hara, Professor of Wildlife Toxicology at the Institute of Arctic Biology, University of Alaska Fairbanks, and his graduate student Darce Holcomb. This partnership, with funding from National Park Service (NRPP-NRM), Oceans Alaska Science and Learning Center, ADF&G, and the Alaska Sealife Center, will assess contaminant load and health status, and be examined in the context of the recent population decline, representing the first systematic study of contaminant loads in an upper-trophic level predator in Glacier Bay. Specifically, the project will include a systematic evaluation of serum antibodies to specific disease agents (marine and canine morbilliviruses, *Brucella* spp., *Leptospira* spp., Avian Influenza, *Toxoplasma gondii*), and detection and genotyping of select protozoa (e.g. *Cryptosporidium* spp. and *Giardia* spp.), determine concentrations of essential and non-essential elements (Hg, Se, Cd, Zn, Pb, Cu) and organohalines (e.g., chlorinated pesticides, PCBs, brominated flame retardants) in seal tissues to assess nutrient-contaminant interactions with respect to seal health/condition, develop a clinical picture of "healthy" harbor seals, determine if any apparent change in a clinical assay can predict survivorship or reproductive performance of marked animals, and finally compare these levels to existing levels in populations of harbor seals in other parts of Alaska or elsewhere to evaluate levels in relation to population trends. Archived samples collected during previous capture trips have been sent to Dr. O'Hara's lab and analysis has begun. More samples were collected during this trip to supplement and expand on existing samples and analysis.

### Other

The capture trip provided a few other interesting pieces of information related to the overall seal project. First, a subadult male seal (PV07GB29) was captured that had several skin lesions (Figure 7). Tissue samples were taken and are currently being analyzed at the Alaska Sea Life Center.

Second, two seals captured during these efforts were 're-captures' from 2006, allowing for an assessment of growth and health of these individuals as well as inspection of the tags deployed originally. PV07GB08 and PV07GB45, both subadult females, were originally captured in September of 2006 and fit with implant transmitters. In both cases, the transmitters were working well and visual inspection showed very little indication of a surgical incision in the area where the transmitter was implanted.

Harbor seal capture trip participants included biologists from National Park Service-Coastal Cluster Program, Alaska Department of Fish and Game, Alaska Sealife Center, University of Alaska Fairbanks, University of Wyoming, and

Captain Dan Foley (R/V *Steller*). Harbor seal captures were conducted under NOAA Fisheries Permit No. 358-1787-00 issued to Alaska Department of Fish & Game and GLBA Permit # GLBA-2007-SCI-003.

Table 1. Animal id#, sex, age, mass, and capture location of harbor seals captured from September 10-16, 2007 in Glacier Bay.

<b>ANIMAL ID#</b>	<b>SEX</b>	<b>AGE</b>	<b>MASS (KG)</b>	<b>CAPTURE LOCATION</b>	<b>SATELLITE TRANSMITTER</b>
PV07GB07	F	SA	42.6	JHI	X
PV07GB08	F	SA	36.8	JHI	X
PV07GB09	M	YR	24.5	JHI	
PV07GB10	F	SA	25.9	JHI	X
PV07GB11	M	PU	26.9	JHI	
PV07GB12	F	AD	65.6	JHI	
PV07GB13	M	AD	54.1	JHI	
PV07GB14	M	SA	49.6	JHI	
PV07GB15	F	YR	31.4	JHI	X
PV07GB16	M	PU	26.0	JHI	
PV07GB17	F	AD	70.9	JHI	
PV07GB18	F	PU	26.8	JHI	X
PV07GB19	M	SA	52.2	JHI	
PV07GB20	F	PU	20.3	JHI	
PV07GB21	F	PU	25.2	JHI	X
PV07GB22	M	PU	25.8	JHI	
PV07GB23	M	PU	28.6	JHI	
PV07GB24	F	SA	30.8	JHI	X
PV07GB25	M	SA	54.2	JHI	
PV07GB26	F	PU	23.1	JHI	
PV07GB27	F	PU	31.6	JHI	X
PV07GB28	F	AD	67.5	JHI	
PV07GB29	M	SA	39.9	JHI	
PV07GB30	M	SA	52.4	JHI	
PV07GB31	M	PU	26.4	JHI	
PV07GB32	F	YR	22.9	JHI	X
PV07GB33	F	YR	26.4	JHI	X
PV07GB34	F	YR	25.0	JHI	X
PV07GB35	M	YR	25.1	JHI	
PV07GB36	F	PU	21.6	JHI	
PV07GB37	F	YR	26.3	JHI	
PV07GB38	M	YR	27.7	JHI	
PV07GB39	M	AD	61.7	JHI	
PV07GB40	M	PU	24.4	JHI	
PV07GB41	F	PU	23.5	JHI	X
PV07GB42	M	SA	36.8	JHI	
PV07GB43	M	PU	28.0	JHI	
PV07GB44	M	PU	25.6	JHI	
PV07GB45	F	SA	42.1	JHI	
PV07GB46	F	SA	34.6	JHI	X
PV07GB47	M	SA	44.8	JHI	
PV07GB48	F	SA	33.6	JHI	X
PV07GB49	F	SA	35.2	JHI	X



Figure 1. Harbor seal with head-mounted satellite tag (Spot 5, Wildlife Computers) in Johns Hopkins Inlet.

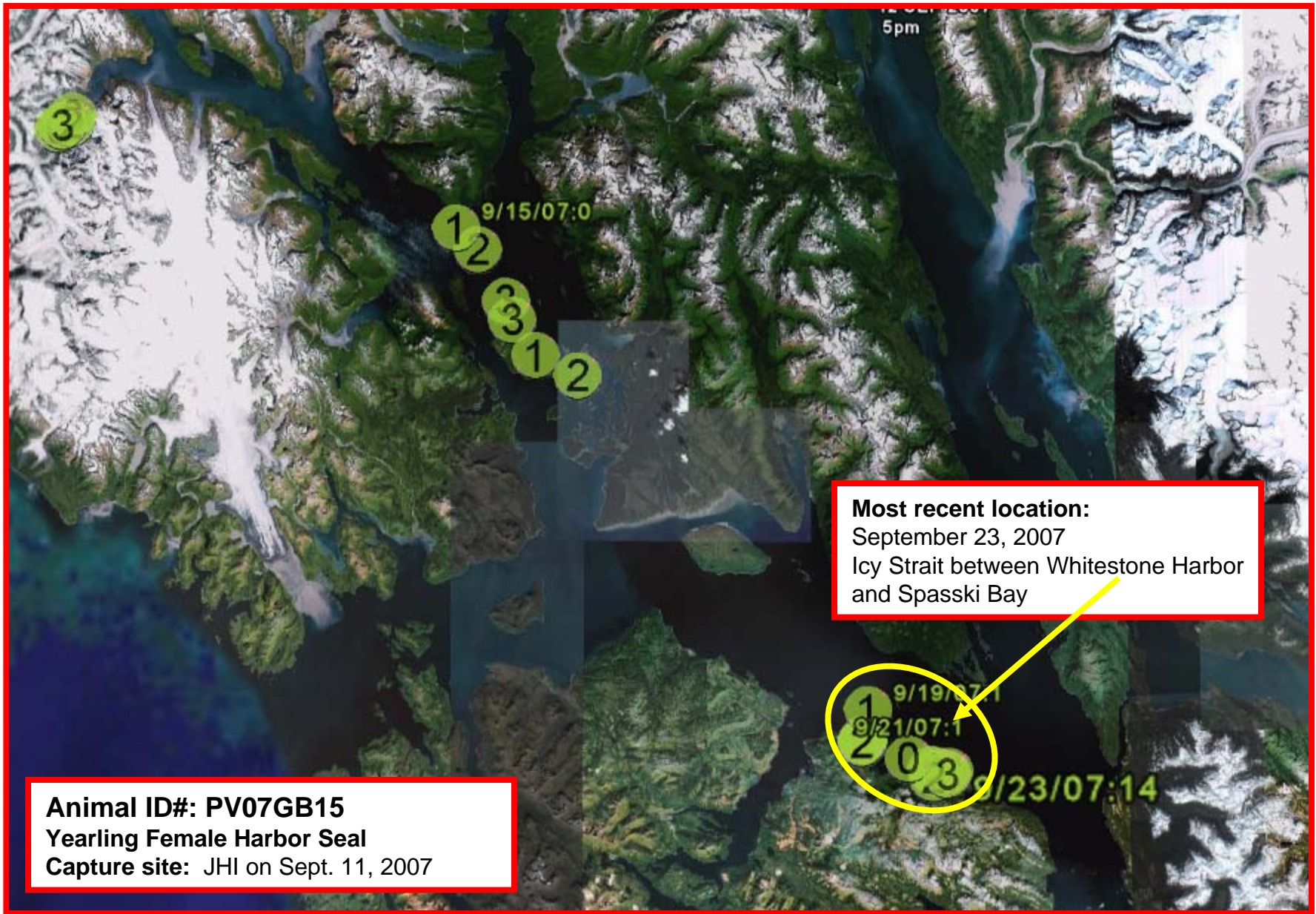


Figure 2. Argos satellite locations from harbor seal #PV07GB15.

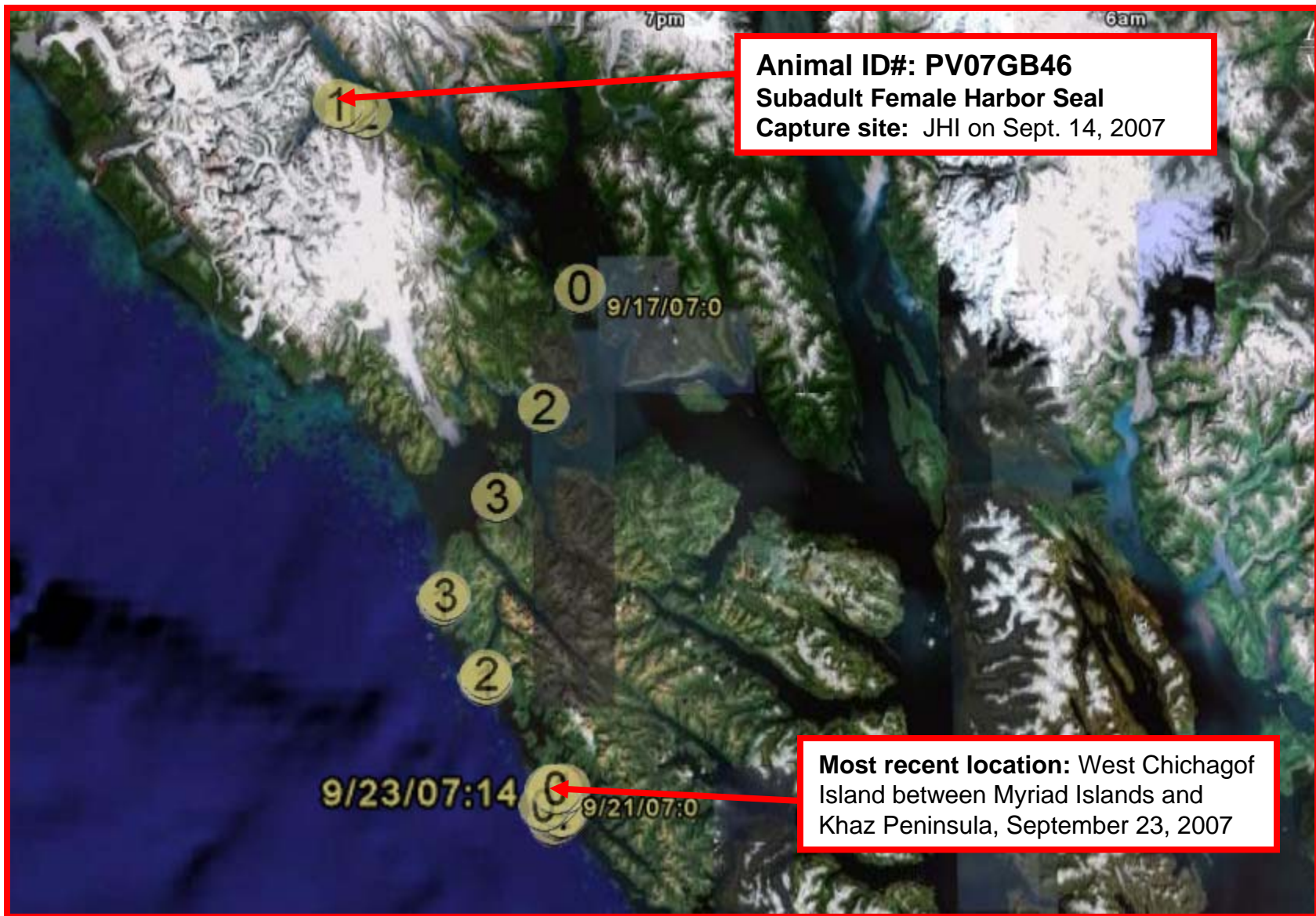


Figure 3. Argos satellite locations from harbor seal #PV07GB46.



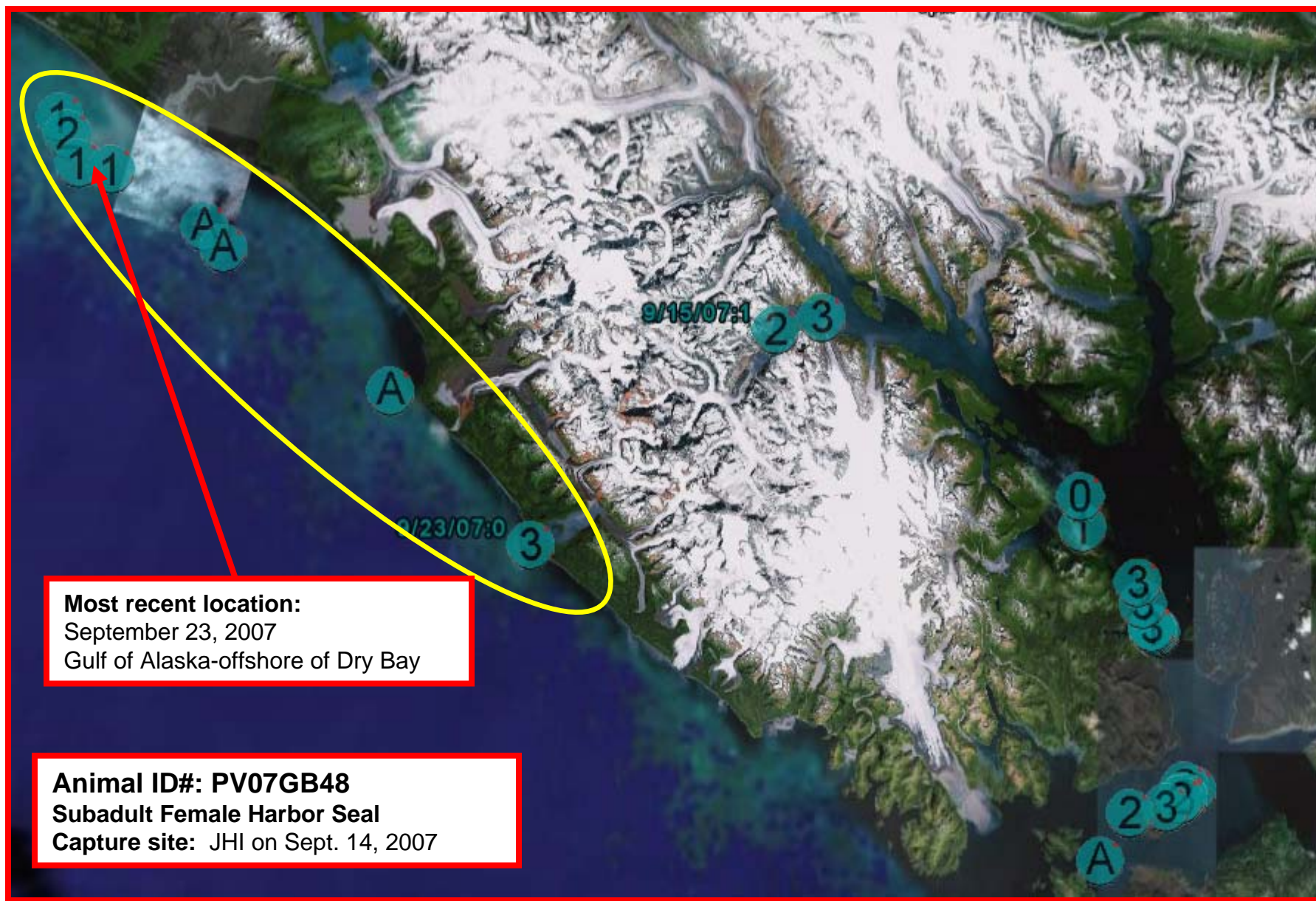


Figure 4. Argos satellite locations from harbor seal #PV07GB48.

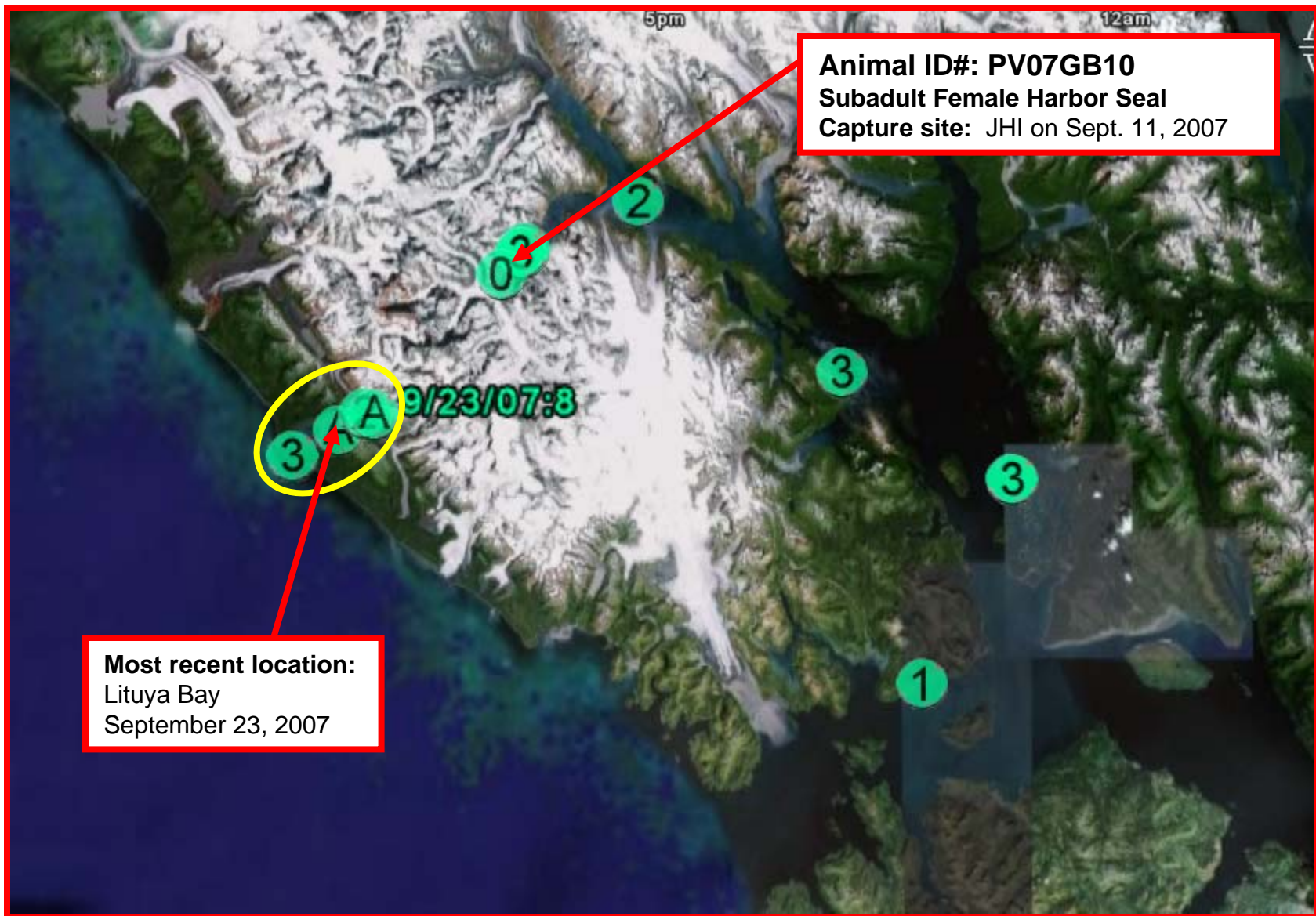


Figure 5. Argos satellite locations from harbor seal #PV07GB10.

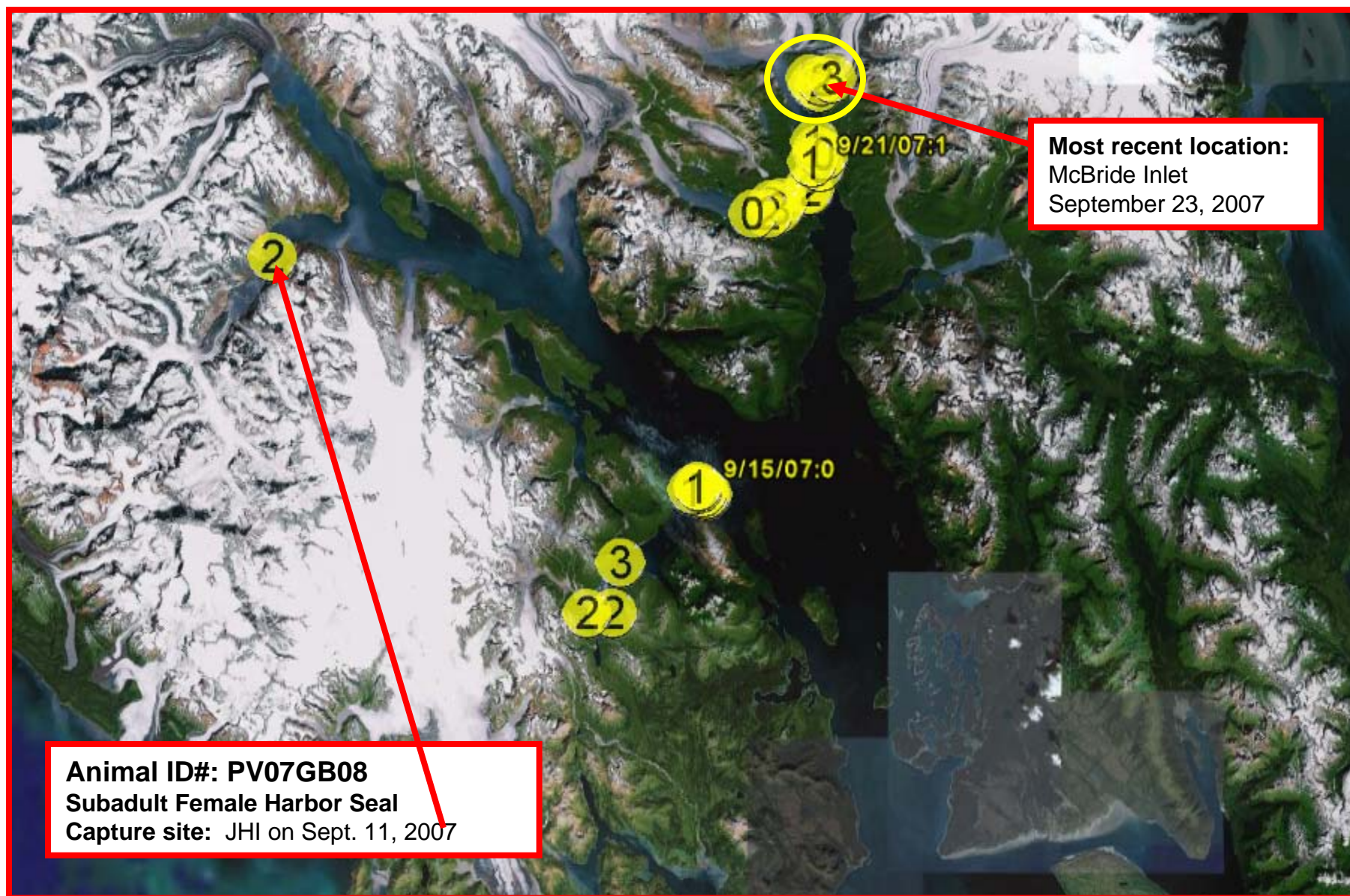


Figure 6. Argos satellite locations from harbor seal #PV07GB08.



Figure 7. Skin lesion on dorsal surface of subadult male harbor seal (PV07GB29) that was captured in Johns Hopkins Inlet on September 13, 2007.