

U.S. Antarctic Marine Living Resources Program

2012-2013 Weekly Field Reports

Cape Shirreff, Livingston Island

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Science Report

Seabirds

1. In the first week since peak gentoo hatch, none of the gentoo reproduction study nests are still incubating, 18% are brooding one chick, 16% are brooding two chicks, and 66% have failed. Only one nest of the chinstrap reproduction study nests is still incubating, 28% are brooding one chick, 38% are brooding two chicks, and 33% have failed.
2. We continue to monitor known-age penguins. None of these nests are still incubating eggs. Of the 38 gentoo penguin nests, 24% are brooding one chick, 13% are brooding one chick, and 63% have failed. Of 59 known-aged chinstraps that have initiated clutches, 34% are brooding one chick, 17% are brooding two chicks, and 49% have failed.
3. On 18 January we began weighing gentoo chicks and on 17 January we began weighing chinstrap chicks from the reproduction study and known-aged breeder nests. The mass is recorded from these chicks at 21 days old to determine their condition before crèche.
4. We started deploying radio tags on gentoo penguins this past week to measure foraging trip durations during the chick-provisioning period. We currently have 13 radio tags deployed on gentoo penguins and 19 on chinstrap penguins.
5. Between 18 and 20 January we deployed six satellite transmitters and five time depth recorders (TDRs) on chinstrap penguins that are brooding chicks. The satellite transmitters will be used to determine where the penguins forage and the time-depth recorders give profiles of diving behavior. We will recover these instruments after one week of deployment.
6. We continued to collect diet samples from chinstrap penguins this week and have also started to collect samples from gentoo penguins. To date we have collected samples from 10 chinstrap and five gentoos penguins. We record total mass of stomach contents, diet composition, and length and sex frequency of krill for each sample. Chinstrap penguin diet samples have consisted almost entirely of Antarctic krill (*Euphausia superba*) with trace amounts of fish. Gentoo penguin diet samples were a mix of Antarctic krill and fish.



7. We continue to monitor Brown skua territories. Of the territories that are regularly monitored, all of them are now brooding chicks or have failed. 47% of these nests have one chick, and 53% have failed.

Pinnipeds

8. Of the original 12 time-depth-recorders (TDRs) deployed on perinatal females we have only five remaining for monitoring dive behavior. The six GPS-TDRs we deployed have all been recovered as well as one Mk9 TDR whose female lost her pup to leopard seal predation. One other has not returned from her second trip to sea and has not been seen since 16 December.
9. Fourteen of our 30 CCAMLR attendance females have completed six trips to sea. To date ten of our attendance females have lost their pups before completing six trips. Leopard seal numbers continue to increase and we expect to lose more pups in the coming weeks.
10. Trip durations continue to be longer than average for the fifteen years we have been monitoring. Four females lost pups to starvation, and two of these have not yet returned from their first trip. Only 24 attendance study females completed at least three trips to sea before losing their pup and 20 completed at least five. Trip durations are as follows: first trip: 4.71 d (s.d. = 4.86, n = 26), second trip 4.86 d (s.d. = 2.25; n = 24), third trip 4.84 d (s.d. = 1.37; n = 24), fourth trip 4.39 d (s.d. = 1.57; n = 24), and fifth trip 4.68 d (s.d. = 1.25; n = 20). The maximum trip duration remains at 23.3 days.
11. Nine of the pups of the 14 females that have completed six trips to sea have been weighed according to protocol. Mean mass gain from the start of female foraging cycles to completion of the sixth trip suckling bout is 81.1 g/d (s.d. = 21.1; n = 9; range: 42.3 - 108.6).
12. We continue to monitor our adult tagged female population and mother pup pairs to get a measure of reproductive success and loss of pups due to leopard seal predation. Pups are now actively playing and swimming off shore where they are easily accessible to leopard seals. Our current estimate for pup loss to leopard seal predation as of yesterday (20 January) is 11.3%.
13. On 19 January, we conducted a sample of CCAMLR pup weights. The mean mass was 8.6 ± 0.14 kg (S.E.), and the range of masses was 4.8 – 12.8 kg.



14. This week we started collecting our fifth fur seal diet sample of ten scats. To date 47 scats have been collected. We also began processing scats for krill carapaces and fish and squid remains; three scats have been processed to date.
15. On 18 January we completed our ninth weekly Cape-wide Phocid census. We counted 259 southern elephant seals, 35 Weddell seals, and 19 leopard seals.
16. Leopard seals continue to arrive and as of 21 January we have recorded 152 sightings of 24 tagged seals. We have recorded an additional 27 sightings of untagged or otherwise unidentified seals. We have deployed ID tags on four previously untagged animals this year.
17. Leopard seal captures and CRITTERCAM deployments: In an effort to describe leopard seal foraging behavior and quantify their impact on Antarctic fur seals, we will be deploying animal borne video instruments (CRITTERCAM developed by National Geographic's Remote Imaging group) along with highly accurate GPS surface location instruments on adult female leopard seals. To date we have successfully performed five leopard seal captures on three animals. We have deployed three CRITTERCAM/GPS systems and recovered two of them.
18. Both the seabird and the pinniped monitoring programs will be utilizing a new sampling platform in the coming weeks. The APH-22 hexacopter is a small, remotely controlled aerial sampling platform. Developed in collaboration between NOAA's Southwest Fisheries Science Center and Aerial Imaging Solutions, Inc., the APH-22 has an onboard digital camera for imaging and is linked via telemetry to a ground station. It will be used to map penguin and seal colonies and to image leopard seals for studies of mass and nutritive condition indexing. To date the bird has been set up, tested, and deployed on one leopard seal imaging mission.

Weather

19. The weather has been a bit warmer and wetter this week. Winds averaged 8.2 mph with a maximum wind speed of 39 mph. Westerlies dominated the week (56 %), with 21.9% of the wind coming from the east. Precipitation for the week was 0.22 inches bringing the season total to 1.28 inches, which was less than half of last year's total at this time (2.75 inches). The average temperature was 1.2°C with a high of 3.5°C and a low of -0.7°C. Mean daily solar radiation was 10,784 Wm². Sunrise is now at 4:03 am and sunset is at 10:14 pm.



Camp

20. On 15 January the M/V *National Geographic Explorer* called and retrieved Greg Marshall (National Geographic Crittercam team) in calm seas with little wind. We'll miss Greg's upbeat personality and practical joke flare. We'd also like to thank National Geographic/Lindblad for excellent logistical support for the leopard seal project this season.
21. Then mid-day on 16 January, we bid goodbye to outgoing camp leaders Dr. Mike Goebel and LTJG David Vejar. We welcomed Dr. Jefferson Hinke (NOAA/AMLR) and a team of seven Chilean researchers and logistical personnel (INACH). The current population of the Cape is now fourteen. All transfer of personnel and personal gear was accomplished by the Chilean Navy using two helicopters.
22. We welcome Jefferson Hinke on to the U.S. AMLR field team. Jefferson is a leader of the AMLR seabird program, and will also be piloting (along with Doug Krause) the APH-22. We'd also like to say farewell to Mike and David whose warmth, energy and excellent cooking will all be very much missed.
23. On January 18 all of the Chilean research gear, food, and logistical/construction equipment arrived along with a highly-anticipated resupply of fresh fruit and vegetables arrived via small boat from the Chilean Navy vessel *Lautaro*. Both camps helped to offload the substantial eight zodiac loads of equipment and food. The offload took 5.5 hours. Everyone on the crew is very appreciative of all those that helped to get our resupply to the Cape.



Presented by Doug Krause and Jefferson Hinke, with assistance from Nicole Cook, Jay Wright, Melany Zimmerman, and Michelle Goh at the Cape Shirreff Field Camp, Livingston Island, South Shetland Islands, Antarctica

