U.S. Antarctic Marine Living Resources Program

2014-2015 Weekly Field Reports
Cape Shirreff, Livingston Island

Report 18
March 2, 2015

Seabirds:

1. Chinstrap chicks continue to fledge this week. We will continue to collect fledgling weights as chicks depart the colony throughout the fledging period.

2. On February 23rd we banded 51 gentoo penguin chicks. In the future, resights of the bands will help us determine cohort survival and with luck, some of these penguins will become part of our known age reproductive study.

3. Only five of 21 brown skuas territories remain active; 16 have failed. We are continuing the collection of 48-day measurements (body weight and bill morphometry) of brown skua chicks in the active nests.

4. A significant portion of the week was spent compiling and proofing data.

Pinnipeds:

5. Of the original 32 CCAMLR attendance Antarctic fur seal females, only five had surviving pups at the conclusion of the study.

6. Nineteen of the 32 attendance study females completed at least six trips to sea before they lost their pup. Of the five females with pups at the end of the season, three completed at least 13 trips. Trip durations for the first six trips are as follows: first trip: 2.64 days (s.d.=1.55, n=31), second trip 4.30 days (s.d.=1.86, n=31), third trip 4.43 days (s.d.=1.62, n=30), fourth trip 4.56 days (s.d.=1.61, n=28), fifth trip 4.36 days (s.d.=1.18, n=23), and sixth trip 3.77 days (s.d. = 1.28, n=19). The maximum trip duration for the season was 9.00 days.

7. We concluded monitoring 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. Our estimate for pup loss to leopard seal predation for the 2014-15 season is 73.6%.

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8. We have successfully deployed six conductivity-temperature-depth (CTD) tags on adult Weddell seals. These instruments will record information on foraging location, dive behavior, and ocean salinity for the duration of the austral winter, expanding our knowledge of Weddell seal biology and the oceanography of the regions in which it resides. Foraging location data from the CTD unit will be downloaded throughout the coming months; other recorded data will be downloaded upon recovery of the unit in the austral spring.

9. On February 27th we completed our seventeenth weekly Cape-wide phocid census. We counted 66 southern elephant seals, 20 Weddell seals, and six leopard seals.

10. We have concluded our leopard seal resighting effort for the season. In total we recorded 399 sightings of 38 individuals, 13 of which were tagged this season. We have recorded an additional 54 sightings of untagged or otherwise unidentified seals which have been added to our photo-identification database.

11. We have finished processing the scat samples from female fur seals. Of the 100 scats collected, 97% contained krill, 35% contained fish, and 11% contained squid. In total, 1086 otoliths were sorted to species and counted. The majority of fish were either *Gymnoscopelus nicholsi* or *Electrona antartica*; *G. brauri* and *Lepidonotothen kempi* were also present.

UAS Missions:

12. We spent this week tracking down georeference points from the UAS images for both penguin census and cape mapping priorities. Markers have been identified in aerial photographs, ground photos have been taken to supplement, and GPS coordinates have been logged. Our planned UAS missions are now complete, and the hexacopters are secured for the season.

Weather:

13. Our brief glimpse of summer on the cape appears to have ended, giving way to the return of snow and cold weather. The weekly mean temperature dropped over one degree to just 0.6 °C, with a low of -2.5 °C. The high temperature reached 4.6 °C, thanks to one sunny morning, however the overall mean daily solar radiation was the second lowest of the season at only 8,462 watts per sq. meter. Precipitation was limited to only 0.12 inches, however snow drifts accumulated up to nearly a foot in many areas of camp. The cape also saw the return of strong, gusty winds that averaged only 13.1 mph but reached a high speed of 52 mph. The winds were mostly divided in origin, with 42.9% from the west and 36.8% from the east. Southerly winds accounted for 12.5% of recorded winds while northerly winds represented only 7.6%. Daylight has dropped to 14 hours and 13 minutes. Winter is coming!

Camp:

14. Eleven of 20 window covers have been installed to date; all covers must be installed before closing camp this season.

15. Water barrels at the main camp and the penguin blind are all full; this provides ready access to water next season when we re-open the camp. In the coming days, we plan to secure the rain gutters for the season.

16. The ATV continues to provide researchers easy access to supplies to/from the landing beach. Much of this week is planning the best course of action to bring remaining items up to camp, and to start sending items down to the landing beach in preparation for closing camp.

17. On February 23rd, the new solar array was installed.
This includes four 265W solar panels mounted to the roof of the pinniped lab/workshop, a photovoltaic combiner, and a 150W 'smart' solar controller. The array has been split into two 'series' systems, both individually connected to a single PV combiner, going into the same solar controller. This is to prevent a possible overcurrent of voltage (including cold weather coefficients) and provide individual breaker switches for the east and west solar arrays. The next day, the solar system was successfully connected to the new lithium ion smart battery system.

18. On February 26th, we disconnected the old power system and connected to the new one. Since then, we have observed an average main hut voltage of 13.7V, up from 11.8V on the old battery bank. Audible alarms and erroneous blinking on various 12V DC items around camp has stopped, and we have observed more power and higher voltage for the first time in at least three years! We still need the generator on to power 110V, but the new power system seems to hold together well without input from the gasoline generator.

19. On March 1st, we mounted a second wind generator on the northeastern corner of the workshop, near the eastern door (northern turbine). The scaffolding was secured to the building, and a base mount was constructed from layers of heavy duty 2'x12' wood. A 25' pipe was routed through the scaffolding, with a wooden block underneath to allow cable to pass through. All new wiring for the new wind turbine has been installed and labeled on the distribution panel. In addition, we successfully installed new wiring from the older generator (southern turbine) to the distribution panel, and both stop switches are routed on the same panel. Everything is working great!

20. There are no areas where water enters the building. Our silicone caulk has been holding up this year, despite the absence of dry, sunny weather.

21. This week we plan to winterize one generator, and cycle the other functional generator online until closing. The other two problematic generators will be taken to the landing beach and sent to La Jolla for service prior to the 2015-16 season.

22. This week, we celebrated our sixth and final Weddell seal capture with a toast of fresh squeezed grapefruit juice (fresh produce is coveted on the island)! McKenzie made crab cakes and we enjoyed chocolate chip cookies *a la mode*. This was an extremely productive week, directly a result of everyone's hard work. *Go team!*

Submitted by AMLR researchers currently residing at the Cape Shirreff field station, Livingston Island. Images provided by camp residents and M. Goebel, edited by S. Sexton.