Feeding Distribution of Gentoo Penguins (*Pygoscelis Papua*) : Connections with CODAR and Glider Data

Marine Topics Fall 2015:
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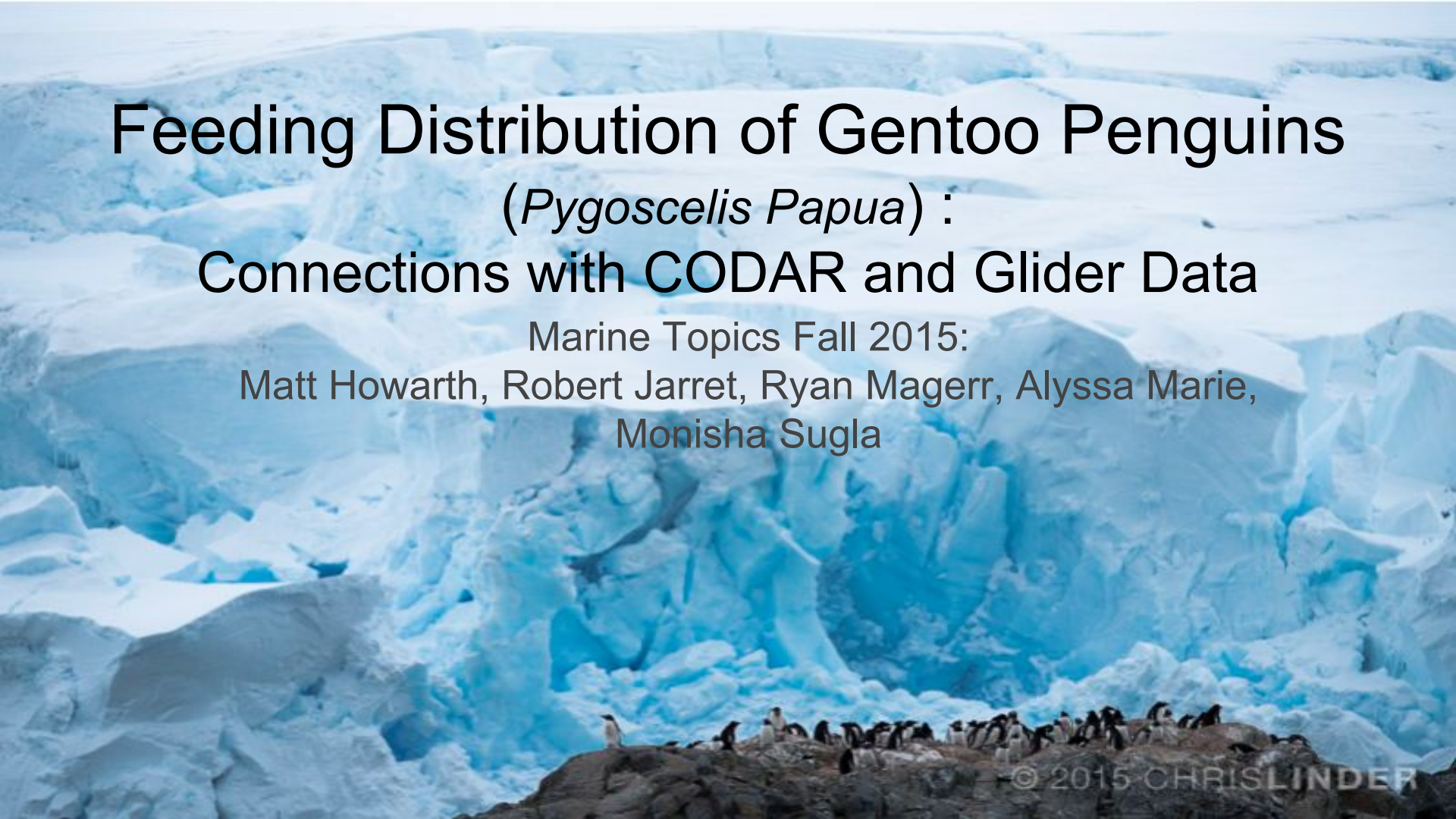


Palmer Station, Antarctica

- Gentoo penguins do not retain the same nests year to year, but instead move the colony a few meters each year
- They may make as many as 450 dives during a single day’s foraging
- Gentoos are the world’s fastest underwater birds

- Opportunistic feeders (fish, crustaceans, squid)
- Foraging usually between 20 km of breeding site
- Gentoo penguins generally forage close to shore at depths of 20 - 100m, although they have been recorded diving to depths of more than 200m.

- Colonies comprised of a few hundred breeding pairs
- Preferred nesting sites are low coastal plains
- Ground nesting birds
- Nests from stones, feathers, or practically any material that they can find
- Egg-laying is usually completed by late October
- Two equally sized eggs of about 130g
- Incubation takes about 34 days
- Gentoo penguins put equal effort into raising both chicks

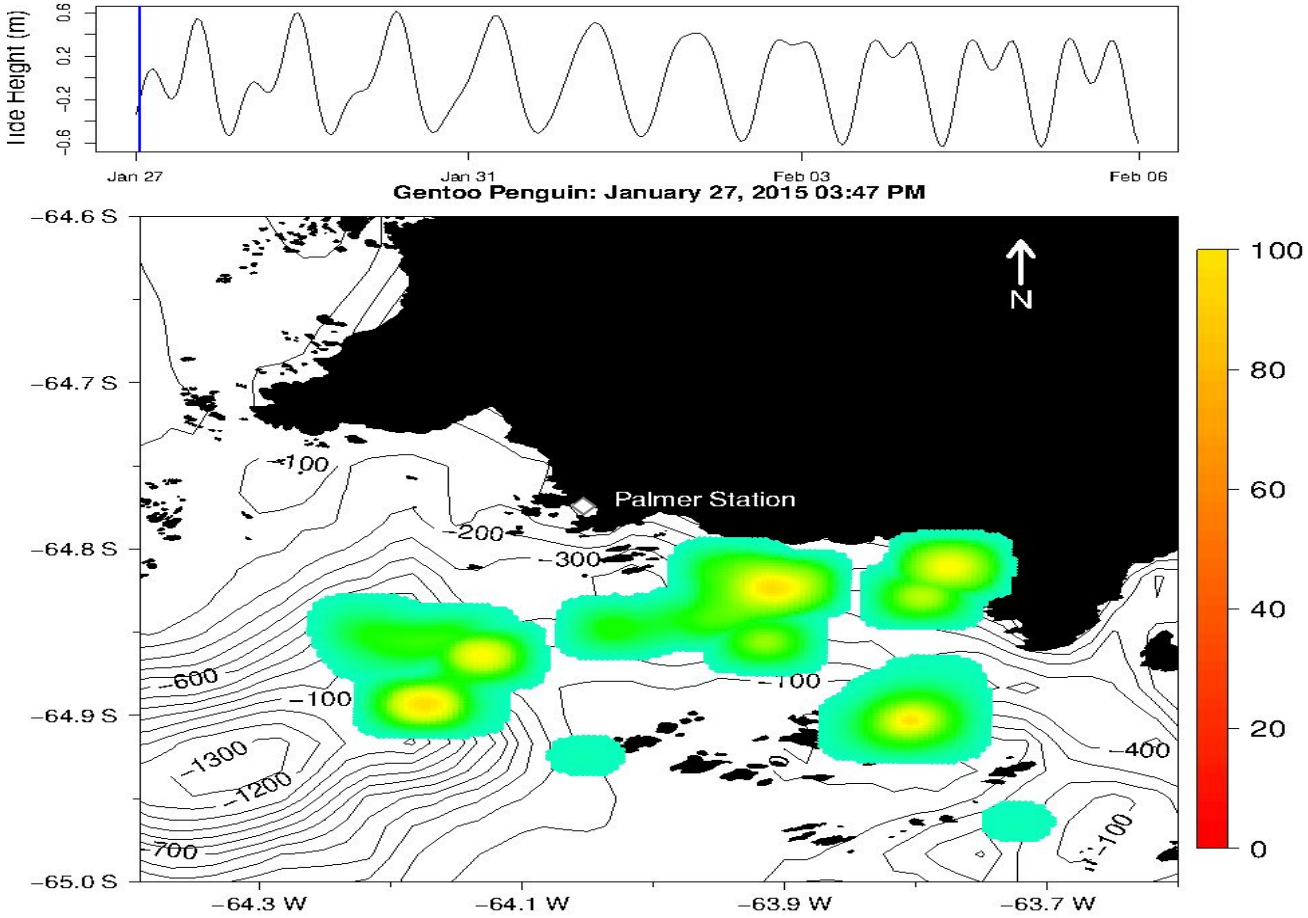
CODAR is used to measure the surface currents of the coastal ocean. A transmitter sends out a radio frequency that scatters off the ocean surface and back to a receive antenna. Using this information and the principles of the Doppler shift, CODAR is able to calculate the speed and direction of the surface current.

CODAR is a noninvasive system that permits to measure and map near-surface ocean currents in coastal waters. It is transportable and offers output ocean current maps on site in near real time. Moreover, using CODAR it is possible to measure waves heights and it provides an indirect estimate of local wind direction.

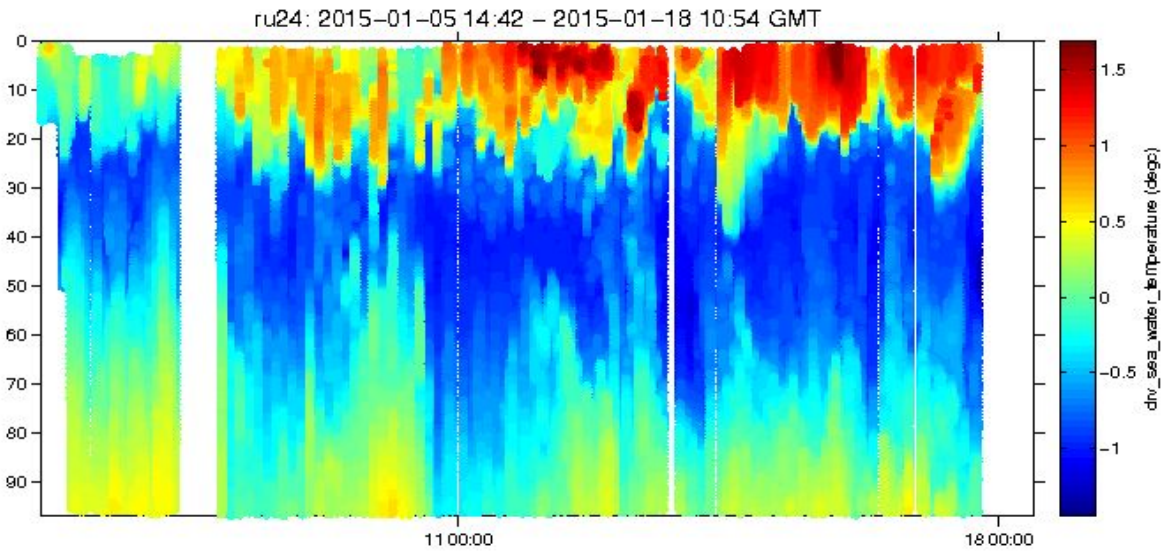
In order to measure currents, the CODAR equipment computes three components:

- the velocity of incoming waves in the radial direction
- the distance from the radar equipment to the evaluated ocean sector
- the angle the waves are traveling relatively to the CODAR station

Gentoo feeding distribution

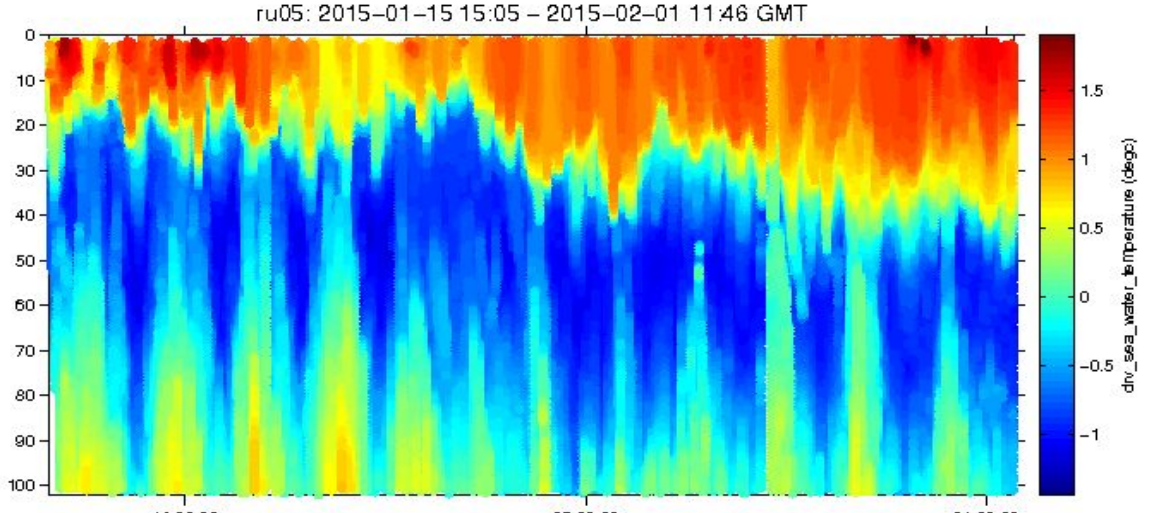


Temperature



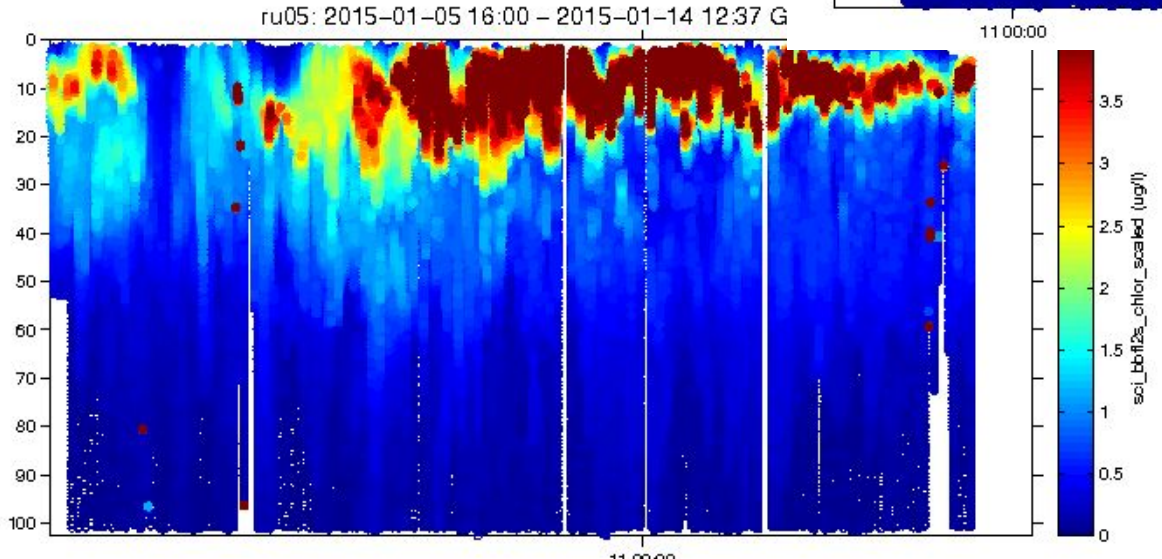
RU24 Glider Jan. 5, 2015

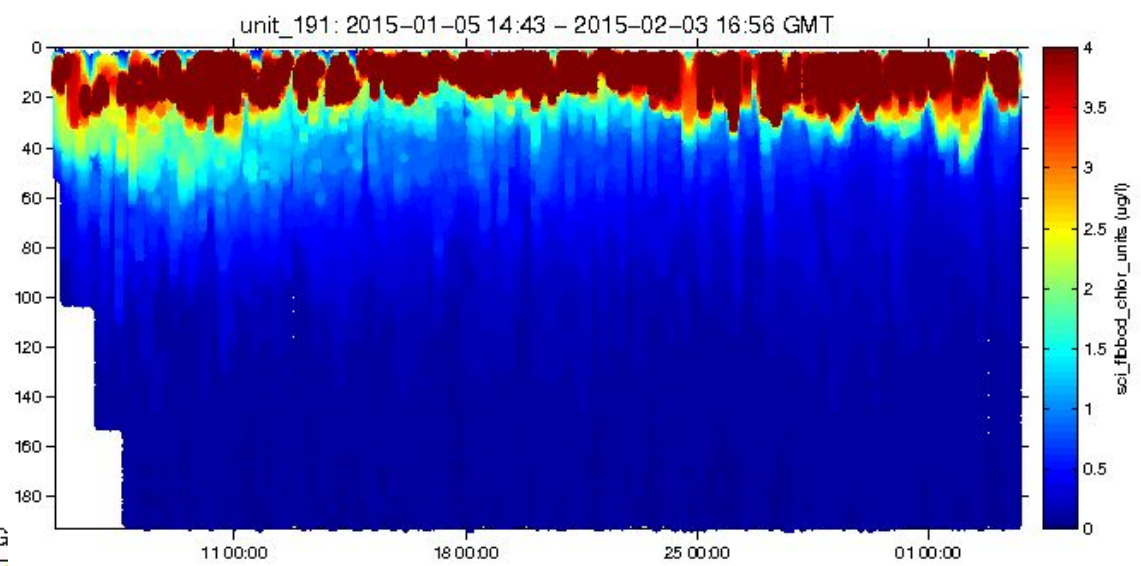
RU05 Glider Feb. 1, 2015



Chlorophyll

RU05 Glider Jan. 5, 2015





UAF Glider Jan. 5, 2015

- Feed on phytoplankton
  - Use chlorophyll as a proxy for the phytoplankton
- Where the phytoplankton go the krill go
- Tracked using acoustics

Male Gentoo #112934.5

Male Gentoo #112935.4

Female Gentoo #112935.5

Male Gentoo #112931.4

Conclusion

- Gentoo penguins tend to feed in areas of intense currents and high chlorophyll
- Why?
  - Swimming with currents
  - Nutrients
  - Krill


Questions?