

## What is a Seabird Bolus?



A Laysan albatross feeds its newly hatched chick on Tern Island in Hawaiian Islands National Wildlife Refuge.

Albatrosses feed their fast growing chicks by regurgitating into their mouth lots of squid, flying fish eggs and fish larva. Much like an owl pellet, a bolus is the indigestible material that is "thrown up" by the juvenile chick when it is about five-months-old. Shaped like a fat cigar, you can dissect a bolus to assess the health of our ocean, the foraging marine world for thousands of albatross trying to gather enough food to feed their hungry chick.



A two-month-old albatross chick on Midway Atoll National Wildlife Refuge waits to be fed by one of its parents foraging at sea. At this age, a bolus has already started to form. *Photo by: @Dan Clark/FWS*

## What Makes up a Bolus?

A bolus contains lots of squid beaks. A squid beak is a beak shaped jaw, made of chitin that does not digest. You may also find small bits of pumice, wood and a soft string like substance that once kept the flying fish egg masses intact.

Unfortunately, there is also unnatural material in a bolus. Flying fish lay their egg masses on any floating structure in the open ocean whether manmade or natural. These floating structures could be pieces of plastic unintentionally swallowed whole by albatross along with the fish eggs. The parent albatross then flies back to its nest to regurgitate what was consumed into the mouth of their albatross chick.

U.S. Fish and Wildlife Service biologists and volunteers find bolus by the hundreds laced with plastics on Tern, Laysan and Sand Islands in the Hawaiian Islands and Midway Atoll National Wildlife Refuges. On a positive note, albatross have the natural ability to expel these indigestible materials. However, it is not uncommon to come upon an albatross chick carcass containing intact toothbrushes, plastic toys, bottle caps, cigarette lighters and fishing line.



An albatross chick carcass Photo by: Robert Schallenger/FWS

### Safety Precautions:

Boluses provided to teachers have been frozen for at least several days. However, it is still very important you advise students not to touch their face while handling a bolus and instruct them to wash their hands well with soap and water after handling. If you prefer, surgical gloves and a mask provide full protection from any harmful bacteria that may have possibly survived the freezer. Although it has never occurred, contracting salmonella is remotely possible.

Please consider keeping a picked apart bolus and an intact one for future educational purposes. The U.S. Fish and Wildlife Service maintain a very limited supply and we never know from year to year if we have the logistical support to continue to provide this service.

*For additional news and photos from Your ational Wildlife Refuges within the Papahānaumokuākea Marine National Monument*

Visit: [www.FrenchFrigateshoals.org](http://www.FrenchFrigateshoals.org) (personal blog)

[www.fws.gov/refuge/midway\\_atoll/](http://www.fws.gov/refuge/midway_atoll/)

[www.fws.gov/refuge/hawaiian\\_islands/](http://www.fws.gov/refuge/hawaiian_islands/)



Pihemanu (Hawaiian place name for Midway meaning “loud din of birds”)

Photo by: ©Susan Middleton

### ***Complimentary Teaching Aides and Resources!***

Online NOAA curricula:

*Winged Ambassadors - Ocean Literacy through the Eyes of Albatross* -- is a brand-new, robust curriculum from Oikonos. Among other lessons, there's a "virtual bolus dissection" using very detailed professional images.

<http://www.downloadwingedambassadors.org/>.

Go to C-MORE link:

[http://cmore.soest.hawaii.edu/education/teachers/science\\_kits/marine\\_debris\\_kit.htm](http://cmore.soest.hawaii.edu/education/teachers/science_kits/marine_debris_kit.htm)

This entire set of 3 lessons (except answer sheets; got to keep those away from Web-surfing students!--available to teachers via email request) is available online. Actual kits, which include a binder of all the lessons as well as various pieces of equipment to be used with the lessons, are available for loan in Hawai'i, California and Oregon via an Online reservation form; (not delivered; you'll need to arrange for pickup & return.) There is a bolus encased in resin, as well as resin mounts of various items from dissected boluses.

**Thank YOU for inspiring the next generation to care about the planet's ocean we ALL depend upon!**

*U.S. Fish and Wildlife Service Volunteers and Staff of  
Midway Atoll and Hawaiian Islands National Wildlife Refuges*

