

# Albatross Bolus Quantification Lab



# Seabird Foraging Methods



**PIRACY:** Great Frigatebird

**PATTERNING:** Sooty Storm-petrel  
Brown Noddy  
Blue-gray Noddy  
Black Noddy  
Harcourt's Storm-petrel

**SCAVENGING:** Black-footed

**DIPPING:** Great Frigatebird  
Bonin Petrel (?)  
Blue-gray Noddy  
White Tern  
Black Noddy  
Wedge-tailed Shearwater



White Tern  
Sooty Tern  
Gray-backed Tern  
Brown Noddy  
Red-tailed Tropicbird  
Red-footed Booby  
Brown Booby  
Masked Booby  
White-tailed Tropicbird

**PURSUIT PLUNGING:** Christmas Shearwater  
Wedge-tailed Shearwater  
Newell's Shearwater

**SURFACE SEIZING:** Black-footed Albatross  
Laysan Albatross  
Bonin Petrel (?)  
Bulwer's Petrel  
Dark-rumped Petrel (?)

(Harrison et al. 1983)

# Laysan Albatross Diet

## *Major Food Items*

Diet known mainly from chicks during the breeding season.

*Food samples from adult birds were particularly difficult to obtain from this species and more than 95% of our samples came from chicks.*

*Samples generally were in an advanced state of digestion, which limited our ability to identify and measure prey items.*

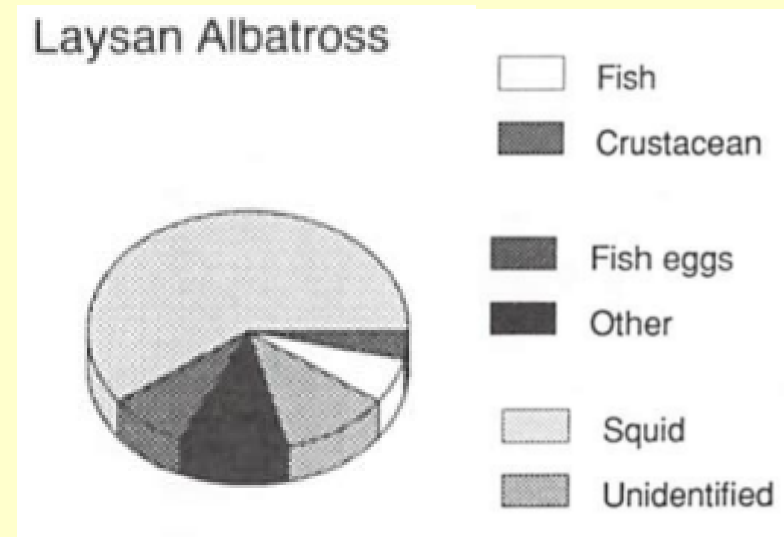
(Harrison et al. 1983)

# Laysan Albatross Diet

## *Major Food Items*

Diet consists (by volume) of:

(Harrison et al. 1983)



65% squid, 9% fish, 9% crustaceans, 4% coelenterates

**Note:** About 10% by volume consisted of stomach oil that we ignored in the laboratory analysis.

# Laysan Albatross Diet

## *Diverse Food Items*

6 squid families

- Epipelagic
- Mesopelagic
- Bathypelagic





# Laysan Albatross Diet

## *Diverse Food Items*

9 fish families

- Epipelagic
- Mesopelagic



# Laysan Albatross Diet

## *Diverse Food Items*

8 groups of crustaceans:

Mysids

Euphausiids

Stomatopods

Amphipods

Caridean shrimp

Isopods (parasitic)

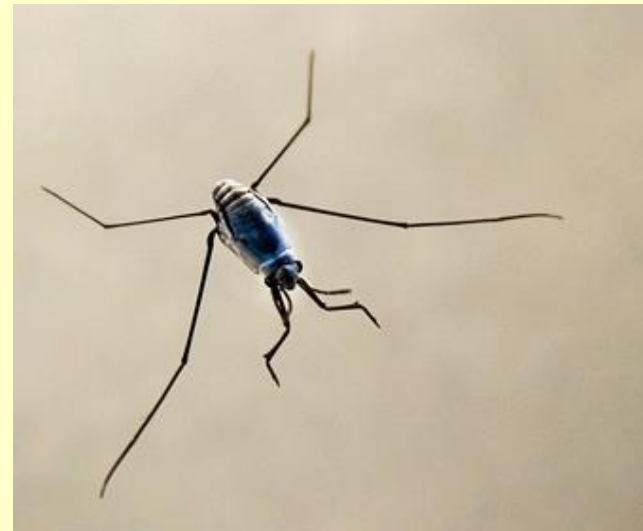
Floatsam crab  
(Planes genus)



# Laysan Albatross Diet

## *Diverse Food Items*

a gastropod (janthina)  
an insect (halobates)  
a coelenterate (velella)  
a tunicate (pyrosome)







# Laysan Albatross Bolus Analysis

## Field Personnel:

USFWS / State HI DOFAW  
collected fresh boluses  
and dried them in the field

## Species ID:

Monospecific areas  
(Kure / Midway) or via  
Direct Observation  
(Tern / Laysan Island)

## Soaked in Lysol:

24 - 48 hrs

## Air dried in lab:

5 - 10 days





# Laysan Albatross Bolus Analysis

TODAY:

Sort Laysan Albatross Boluses

Find / enumerate prey items



# Laysan Albatross Bolus Analysis

**NEXT WEEK: QUANTIFY PLASTIC TYPES**

**By the end of today**

- Sort and weigh three categories:

Food / Natural Non-Food / Non-natural:

- Count and weigh specific items
- Set aside unknown items:
  - Store in petri dish
  - Label with bolus #
- Record information in your data sheet.



# Methods - Sorting / Quantification

Sort into 3 broad categories (Van Franeker 2004)

- Food (beaks, lenses, bones, flyingfish egg line, tissue)
- Natural non-food (pumice, plant material, coral)
- Non-natural (plastic, glass, wood)

Laboratory Measurements (for each category):

- mass (dry weight)
- volume (wet displacement)

Mass / Volume Regressions (for 8 categories):

$R\text{-squared} \geq 0.818, p < 0.001$  (n = 200)

# Seabird Stomach Contents Analysis

**NEXT WEEK:** PLACE contents in petri dish, sort by type and list each type in your data sheet.

Item	Number	%_Number	Wet_Mass (g)	%_Wet_Mass	Comments
TOTAL					

**NOTE:**

Record observations / comments on ingested plastic and parasites below