

Discovering the Pribilof Domain



Pribilof Island School District Marine Science Team

Caitlin Bourdukofsky, Danielle Mercurief, Anthony Lekanof, William Lekanof, Michael Dirks, Feofaneya Rukovishinkoff, Steven Isaac, Cara Lestenkof-Mandregan

... and many other students from both St. George and St. Paul schools.



Caitlin Bourdukofsky

The Pribilofs

Central Bering Sea

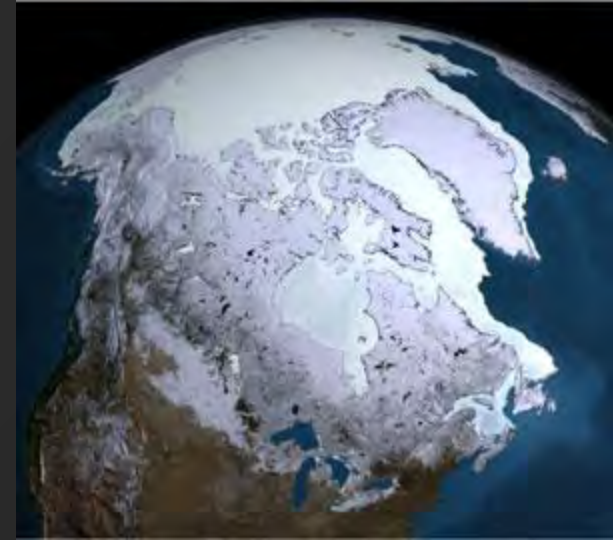
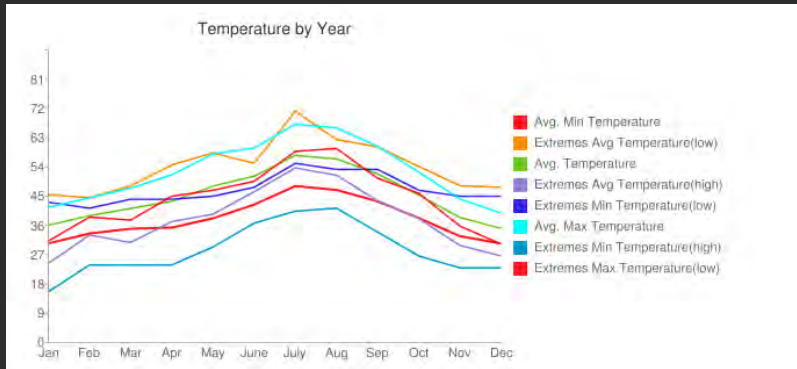
57° N, 170° W

Volcanic in origin, originally part of Beringia

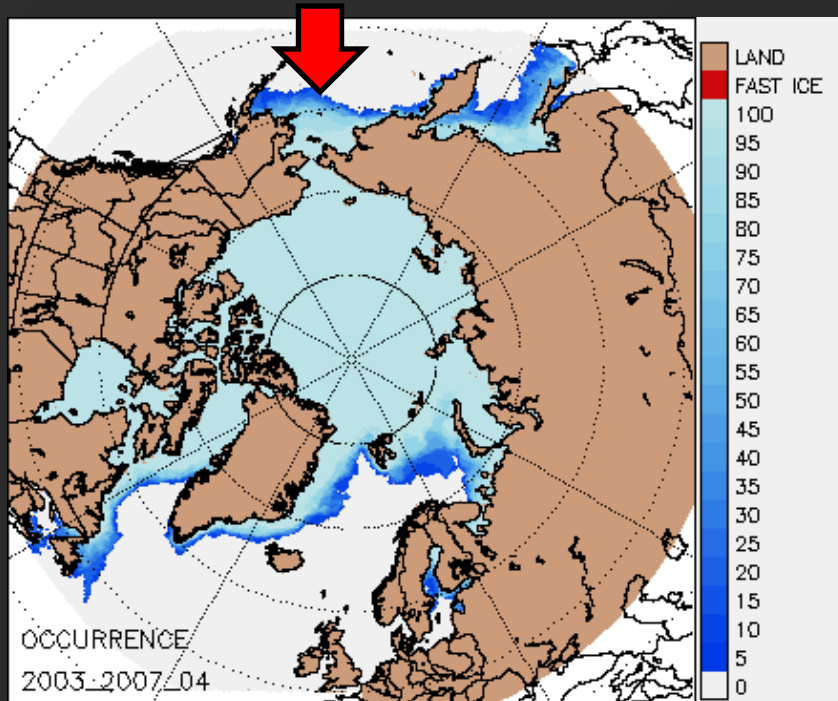
Two of five islands occupied by people



Climate – Windy, cold, sub-Arctic Maritime



Marginal Sea Ice Zone



Ice
Edge
March
2008



Past to Present

Sealing

- Unangan (Aleuts) from the Chain brought to the Pribilofs by Russians
- Harvest Fur Seals
- US Government wards after purchase of Alaska

Fisheries

- Base of economy after commercial sealing ceased
- Halibut (local boats), crab (local crew), other Bering Sea species delivered to onshore processors.





Steven
Isaac

Human Population

~ 80 people on St. George Island



~ 479 people on Saint Paul Island



The majority of permanent residents are Aleut. Saint Paul has been considered the largest Aleut village.

Transportation

Small passenger planes (30 seats).

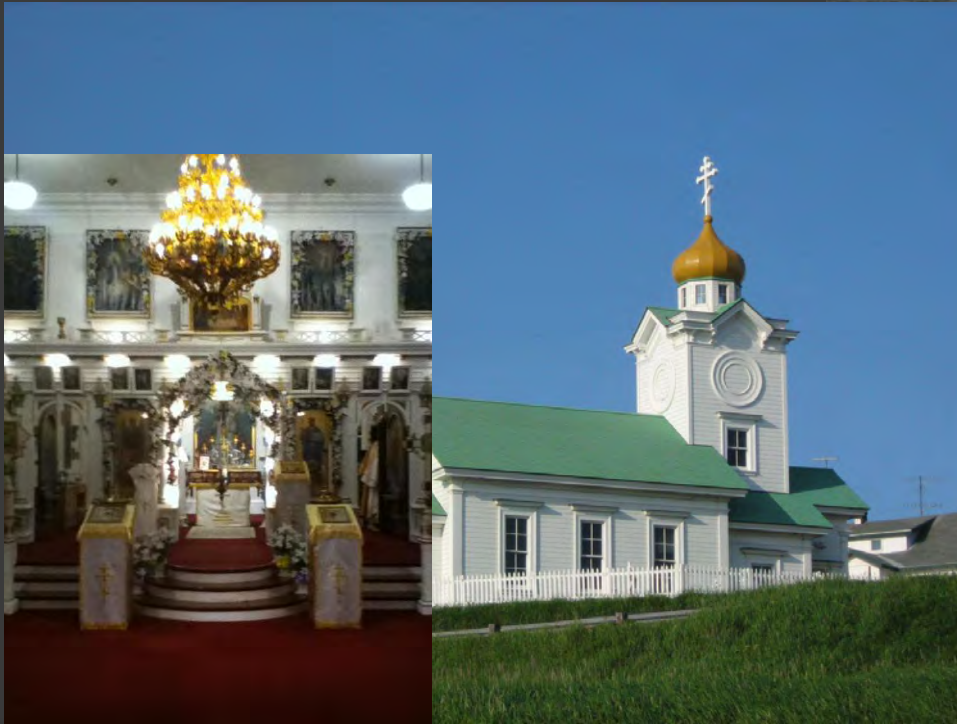


Supplies are brought to Islands by cargo plane or barge.



Religion

Russian Orthodox



Aleut Art and Dancing



Learning from our Elders

ENGLISH	ALEUT OCEAN WORDS
FUR SEAL	^{ALEUT} Kolostock
HALIBUT	Kolost Chu x̄gi (Chagix)
SEALION	Qawa
SEA URCHIN	
OCEAN / SEA	
LEAST AUKLET	Chuuchix [↑]
BOAT	Sunax [↑]
SEAWEED	
CRAB	
Murre	Sikitax [↑]
Seagull	Sugan ^K
Kittiwake	Gavroski ^{Russian} Kagiuth
Rh Kittiwake	Gictha Ramusk ^{SE} Sculpin





Caitlin Bourdukofsky

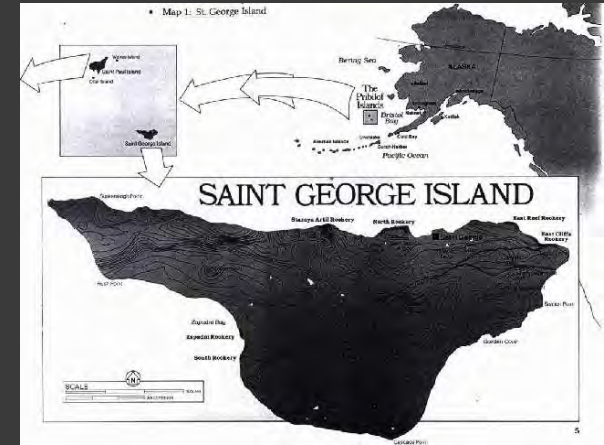
Urchin Studies

Study sites: St. George Island

- Zapadni Harbor
- St. George “old” dock

Key Questions :

- Roe quality
 - percent of body weight
 - color and taste
- Test diameter

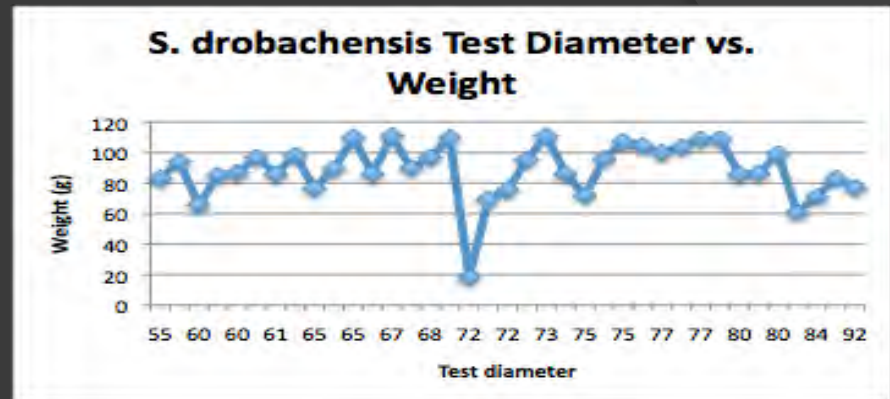


Urchin Study Methods

- Collected live urchins in subtidal zone
- Weighed and measured test diameter
- Extracted roe for weighing/measure
- Conducted color assessment and taste test.



Urchin size range



Urchin “taste test” and color

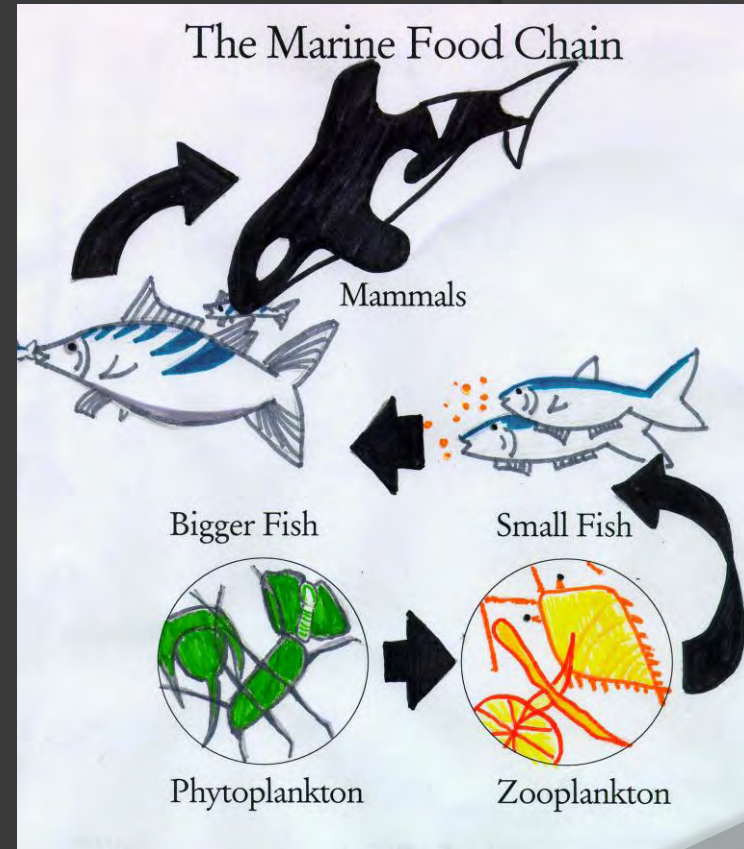
- Student testers rated most samples as “sweet” tasting. (n=10)
- Potential economic endeavor?



Food Web

Big Question: What are the animals around the Pribilof Islands eating?

Many scientists are studying this very topic, we students have decided to join in.



Methods- Stomach Analysis

- Northern fur seal stomachs
- Sea lion stomachs
- Fish stomachs
- Talked to fishermen what they found in fish stomachs.



Samples were obtained from local fishermen, subsistence hunters as well as research vessels sampling in the area. Then sieved, washed and sorted for identification and counting



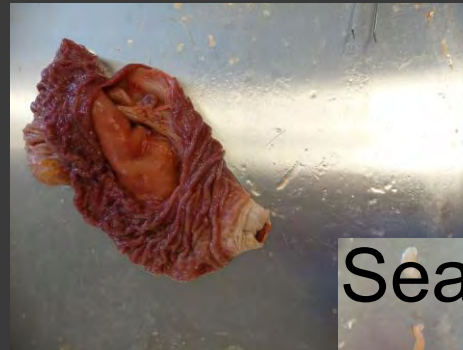
Pribilof Food Web Study

Stomach matter was collected,
Washed through sieves, sorted, picture documented & Identified if possible.

17 Fish species
2 Marine Mammals
2 Octopus

STOMACH CONTENTS

shrimp
squid
euphausiids
chionocetes
king crab
amphipods
roundworms
rocks
molluscs
sculpin



Plankton Study Objective

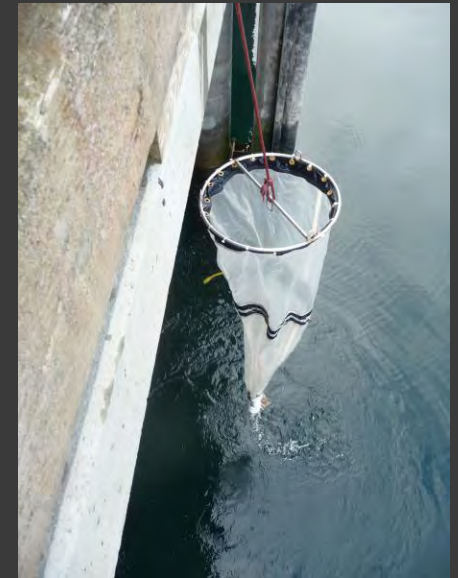


Dani Merculief

Plankton work was conducted through the Spring and Summers of 2008-2011.



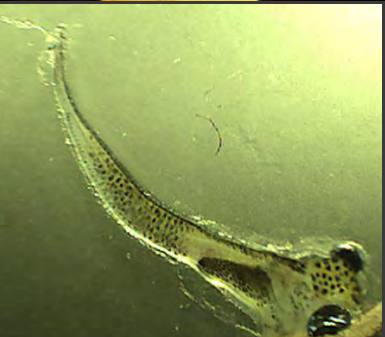
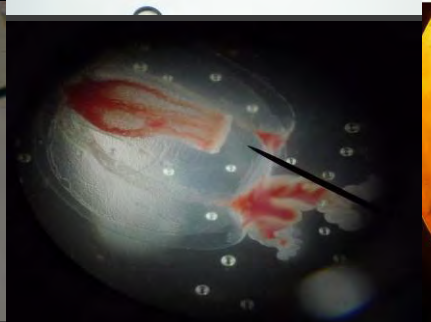
We Gather the Samples...



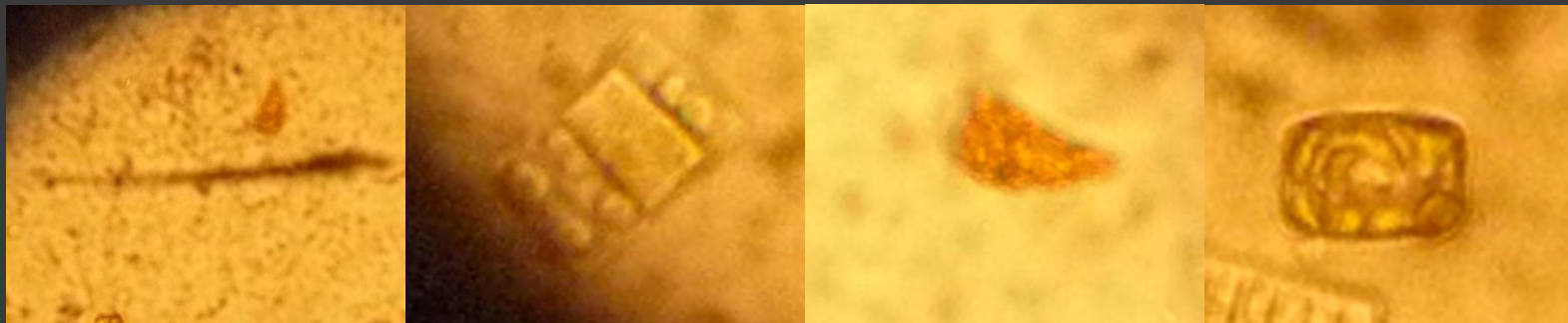
Take samples to the lab for observation of behavior, photo documentation and identification



Selected Pribilof Zooplankton



Sea Ice-associated micro algae



Plankton in food web

- Planktivorous seabirds
- Mollusks
- Young fish i.e. pollock
- Filter Feeders
- Jellyfish



Near shore plankton studies

King crab zoea
species of special
interest !



Anthony C. Lekanof



Pribilof Blue King Crab
Paralithodes platypus

Pribilof Red King Crab
Paralithodes camtschaticus



Field studies on all life stages

King Crab Life Cycle



Diagram: Ginny Eckert, UAF



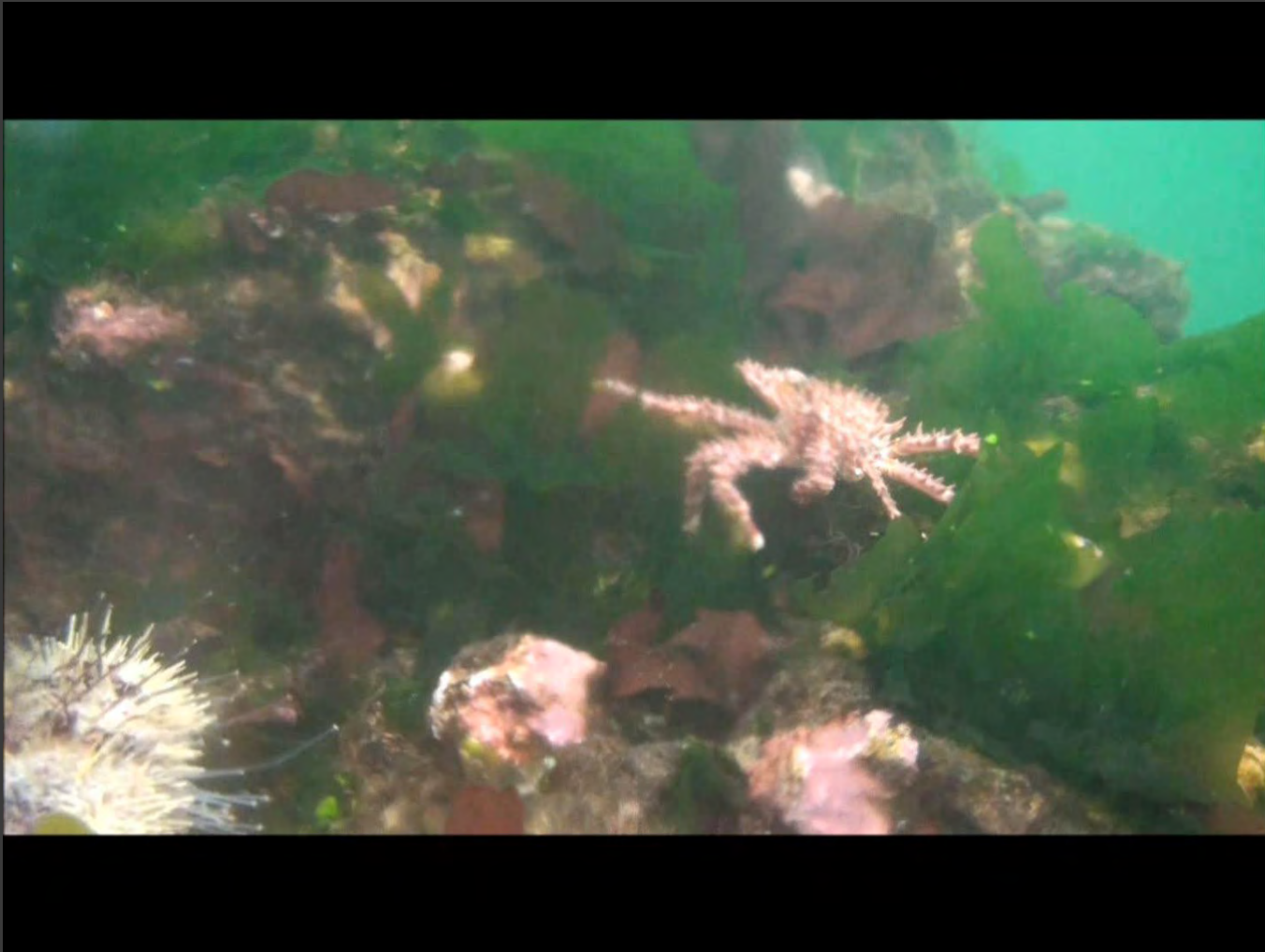
Beach surveys
Plankton tows
ROV subtidal
Molted carapace

King Crab Anatomical Investigations

- Took measurements for length
- Examined carapace features to aid in identification
- Used microscopes to study larval forms ... the zoea and glaucothoe

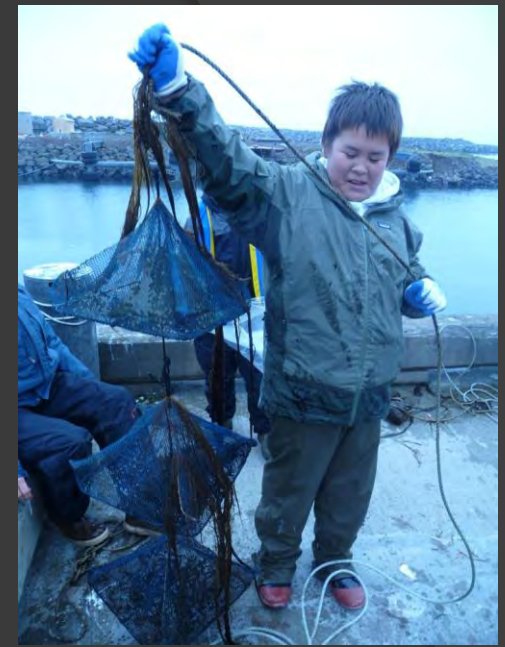


Living king crab at St. George



Crab Trapping

- Plankton nets
- Larvae trap soaked for month
- Crab Pots soaked for 24 hrs
- No Juvenile or Adult Crab were found in traps



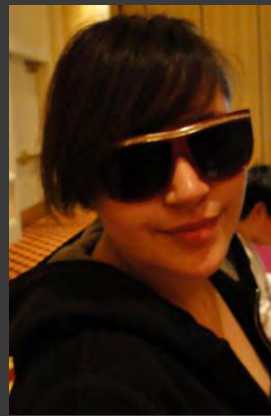
Local Crab Knowledge

Selected comments about status of King Crab

- Trawlers seem to be part of the problem
- Taking all of the food from other animals
- Fishermen are finding cod and halibut stomachs are often stuffed with crab.

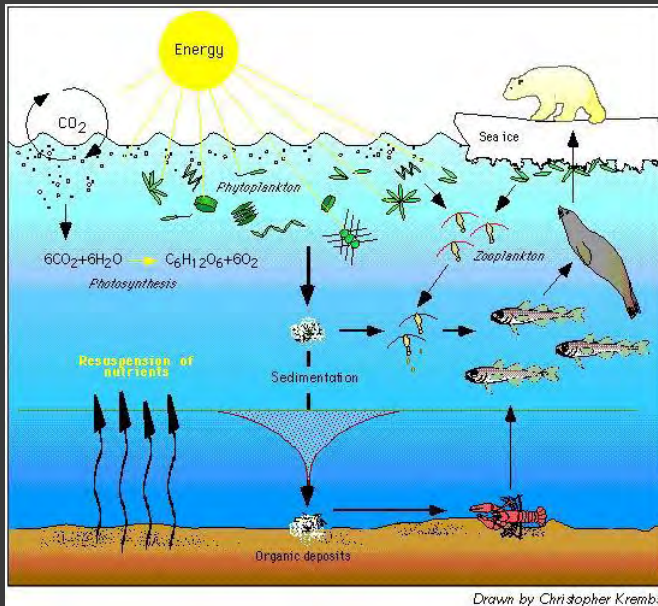


Feofaneya Rukovishnikoff



Pribilof Biodiversity

Pribilofs are called the "Galapagos of the North" because of the rich marine life.



Species List-
2 week
Summer
Camp 2010

PRIBILOF MARINE SCIENCE CAMP 2010
BIODIVERSITY OF ST. GEORGE
MASTER SPECIES LIST

NO.	COMMON NAME	SCIENTIFIC NAME	DATE
1	BRITTLE STAR	Ophiura	7-1-10
2	SEA SLUG	Gastropoda	7-1-10
3	SEA SLUG	Gastropoda	7-1-10
4	SEA SLUG	Gastropoda	7-1-10
5	SEA SLUG	Gastropoda	7-1-10
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100	SEA SLUG	Gastropoda	7-1-10

Mammals and Birds

Whales

Seals

Seabirds



Red face cormorant
Phalacrocorax urile



Northern Fur Seal
Callorhinus ursinus



Least Auklet
Aethia puilla



Red-legged kittiwake
Rissa brevirostris



Horned Puffin
Fratercula corniculata

Fish

- Pollock
- Cod
- Flatfish
- Rockfish
- Forage Fish!
- Myctophids
- Bathypelagic Fishes
- Lampfish



Sculpin
Aleut name
"Candula")



Invertebrates

Limpet



Hair Crab

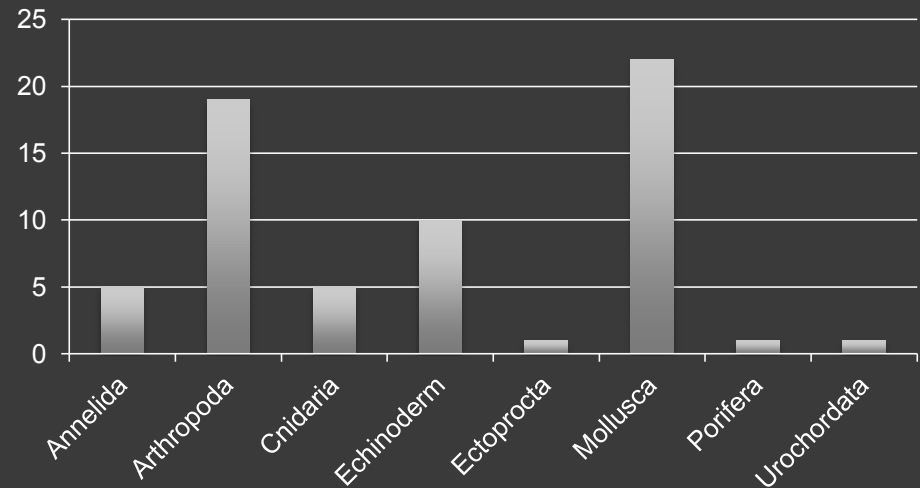
- Echinoderms (seastars, urchins)
- Cnidaria (corals, anenomes)
- Annelids (seaworms!)
- Crustacea (crab, jumping jacks)
- Mollusca (Periwinkles, moonsnails)



Anemone

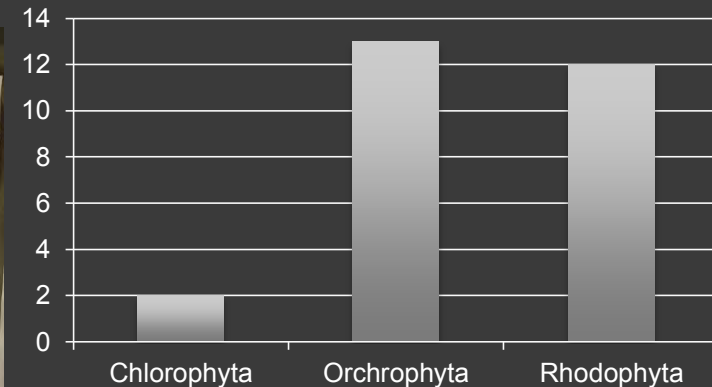
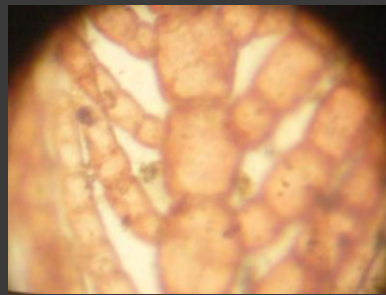


Brittle star



Seaweed and microalgae

- Kelps (Including Golden V)
- Red algae
- Green algae
- Phytoplankton – the greenbelt, basis for most life in the Pribilof Domain
 - In special years, Ice Algae!



Golden V Kelp

- The Golden V-kelp is located next to the shore.
- The Golden V is found in Kagamil and St. George Islands
- Sea Urchins eat the Golden V-kelp.

Sir William Lekanof



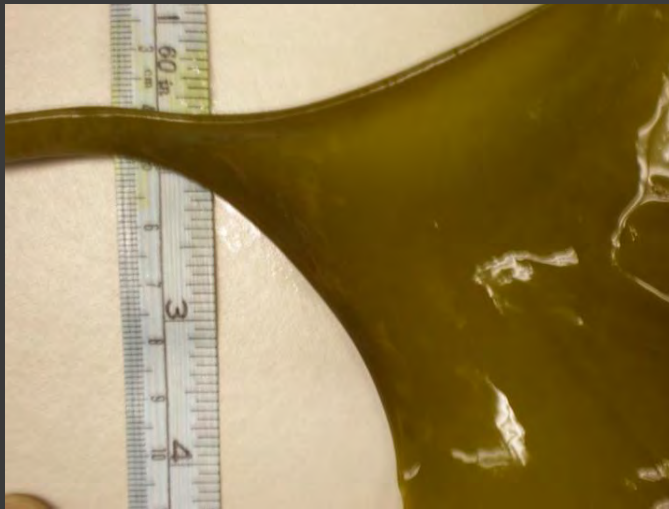
Pribilof Discovery



On August 27, 2008 we received confirmation that it was the genus *Aureophycus* based on *rbcL* DNA sequence data and cellular structure.



Distinguishing Characteristics of *Aureophycus aleuticus*



- The V shape at top of the stipe
- The discoid hold fast



Similar Kelp Species

- One species easily confused in comparison is *Laminaria solidungula*.
- It looks similar to the Golden V-kelp because of its golden brown blade color.



Growth Studies on Golden V Kelp

Project has been ongoing since 2008 in each Marine Science Camp held on St.



GOLDEN V KELP GROWTH STUDY 14 JULY 2009
SURF 4°C SW 35ppt Salinity 6°C AIR 2017

TAG No.	L	W	L-H1	D-H1
452	63cm	18cm	18cm	0.4cm
454	50cm	6cm	17cm	0.4cm
455	39cm	9.3cm	18cm	0.4cm
456	41.5cm	9.5cm	17.5cm	0.4cm
457				

Cara Lestenkof-Mandregen Technology

During our field work, we were exposed to various instruments used in the marine science fields.



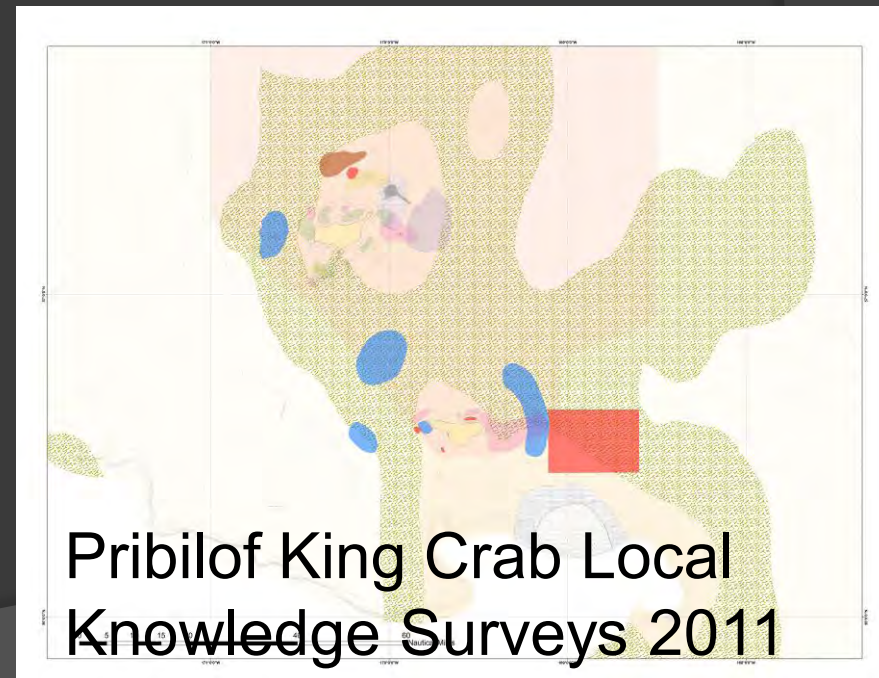
ROVs UW Cameras



Michael Dirks

GPS for recording field data

GIS / mapping tools for analyzing data



Thank you !

All the scientists who mentor our students and make active local marine science learning possible, meaningful, and fun 😊.



All the funders who have contributed over the years.



