June 2016 Issue 1

COASST Science Update

Beached Birds as a Resource?

Overview

Science Update is a special publication of the Coastal Observation and Seabird Survey Team (COASST) highlighting recent research and scientific publications.

In this issue, learn how COASST data indicate that coastal peoples living in southern Washington could easily have scavenged a wide range of birds from Cassin's Auklets to albatross.

Historical note – because middens were laid down centuries before the invention of plastics, they're actually more like compost piles. Hard parts remain, although delicate bones and shells may break and flatten with time and the pressure of subsequent layers. This photo shows layers the run from 400 years before present at the top of the dirt down to almost a thousand years before present. The small yellow tags are marking sample locations.

Photo: Excavation photo from Washington State University field school at the Minard site (1970). Courtesy of Museum of Anthropology, WSU.

One Man's Trash is Another (Wo)man's Treasure

Kris Bovy is an archaeologist and a professor at the University of Rhode Island. Specifically, Kris is a zooarchaeologist; she sleuths out how indigenous peoples who lived in coastal communities along the Pacific Northwest shoreline thousands of years ago used natural resources.

How? By literally picking through the garbage dump - known in the trade as a "midden" or an outdoor trash pile – looking for bones, shells and other preserved hard parts. Because middens were located in specific locations (at the edge of the village? Think about the town dump), over centuries, a midden becomes a layered set of clues to what people collected or hunted. Coastal middens often contain lots of shell material (where do the clam or oyster shells from your last restaurant meal go?) which turns out to be exactly the right chemistry for helping to preserve fish, bird and mammal bones. Like an antacid, the calcium carbonate in shells makes the soil less acidic, keeping bones intact over many centuries.

You guessed it. Middens contain seabird bones. In fact, lots of them. Some of the bones were used to make tools, like the awls shown here. But many bones were probably simply the unused parts of carcasses thrown in the compost.

Beached Birds as a Resource?

These wing bones were intentionally broken and sharpened to create awls, the pointed tools still in use today (albeit now metal) to poke holes in leather. These awls were used to help weave baskets.

Photo: Kris Bovy; Courtesy of the Museum of Anthropology, Washington State University.

There isn't complete overlap (indicated by the blue highlighting), but it's pretty darned close. Of the top 10 species (or taxon groupings) found by COASSTers, almost all were also top species at the Minard site. The numbers in parentheses are bone counts for Minard, and carcass "finds" (not including refinds) for COASST.

Kris has been studying the seabird parts found at the "Minard Site," a coastal community located on the northern peninsula framing Gray's Harbor in Washington State, since she was a graduate student. This midden is the composted and preserved leavings of people living along the coast at least 400 years ago and stretching back to 1,000 years ago.

During her dissertation work, Kris found at least 67 different bird species in the Minard midden, many of them seabirds. Here's a list of the top species she found (sometimes grouped if it was difficult to differentiate between very similar taxa – think LIGU in COASST). In the right-hand column we've listed the top species found by COASSTers along the southern Washington and Oregon coastline. There are some startling similarities! Only rhinos and cormorants are missing from the top 10 list at Minard.

All of the species found at Minard occur in the COASST dataset, with the exception of Short-tailed Albatross. This bird was hunted almost to extinction by the early 1900s, and even now numbers only in the very low thousands. The Minard findings indicate Short-tails must have regularly graced the waters of western North America.

Top 11 Species at Minard	Top 10 Species in COASST PNW
Sooty Shearwater (964)	Common Murre (11,405)
Cassin's Auklet (537)	Northern Fulmar (6,806)
Common Murre (438)	Cassin's Auklet (4,884)
White-winged & Surf Scoters (391)	Large Immature Gulls (2,348)
Northern Fulmar (104)	Western & Glacous-winged Gulls (1,901)
Short-tailed Albatross (102)	Rhinoceros Auklet (1,711)
Medium Goose (94)	Sooty Shearwater (1,104)
Small Loons (Red-throated, Pacific) (88)	Brandt's Cormorant (971)
Dabbling Duck (76)	Western Grebe; Large Grebe (658)
Large Gulls (75)	Surf Scoter; Scoters (316)
Western Grebe; Large Grebe (32)	

Theories and Myth-busting

So what's the deal? It turns out that some in the archaeology community theorize that which body parts are disposed of can tell us something about how historical peoples obtained the birds in the first place. Hunters are thought to have returned with entire carcasses, meaning that the correct proportion of head, wings, and legs would be found in the trash – excepting those bones used for tools. By contrast, birds that were collected – scavenged! – from the beach were thought to have been partial. Why? For one, because those carcasses might not be intact. Some early work suggested that most carcasses float ashore as wings only. And secondly, because human scavengers would only be looking for specific bones; they would discard any rotting flesh (would you take a maggoty carcass home in your daypack?).

Kris and her former student Jessica Watson (now in a PhD program at the University of Albany) began to wonder about hunting versus scavenging. Jessica became interested after doing some work at a coastal site in Oregon. Could the story be more complicated than midden lore suggested? Collecting local breeders from the colonies is one thing, but did indigenous people really have to paddle far offshore to hunt albatross, fulmars or shearwaters?

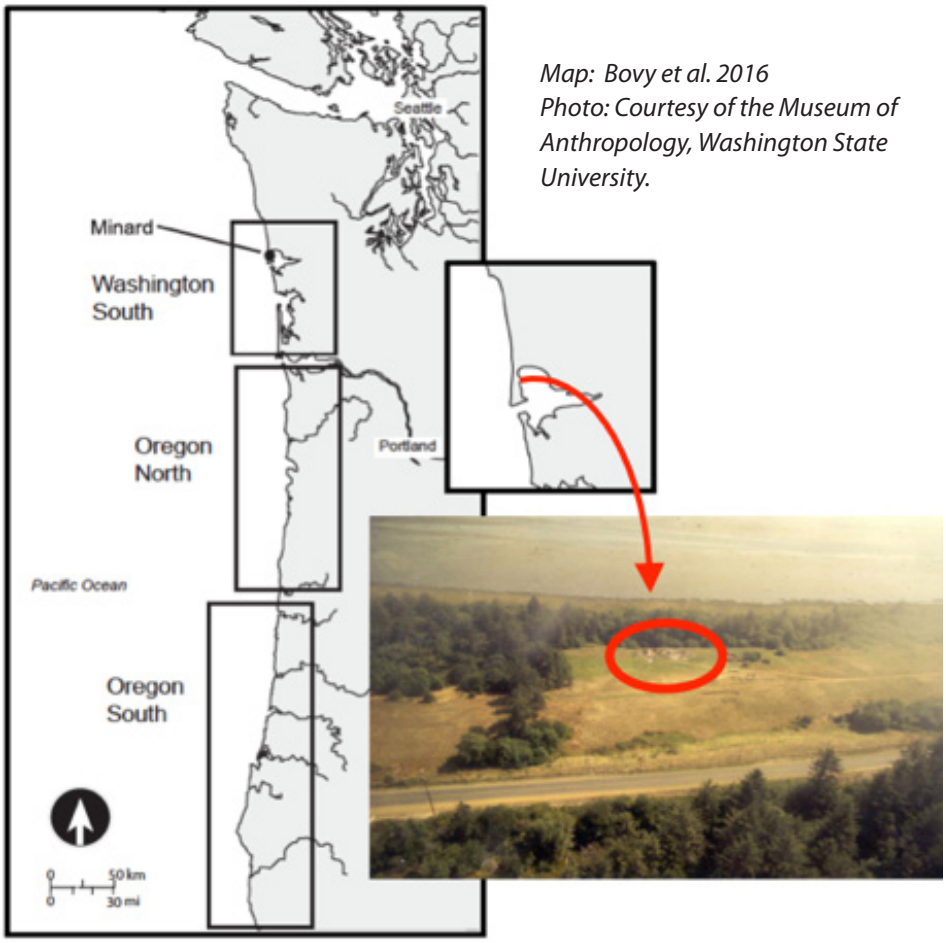
Enter COASST

COASSTers not only collect information allowing species comparisons, they also collect information on carcass condition, including whether carcasses are intact or not, and if not, which body parts are present.

We quickly dispatched the assertion that most beachcast carcasses are wings only – only 10% of COASST carcasses are found this way. However, almost all (98%!!) of the carcasses COASSTers found had at least one wing.

What about the rest of the body parts? Nearly 80% had heads, and 85% had at least one foot. But here's the kicker – COASSTers found completely intact carcasses only 17% of the time – carcasses without a scratch on them.

So what's the story? We think that most carcasses float to shore intact. Most are quickly attacked by scavengers. Bears, coyotes, foxes, cougars, bobcats, raccoons, eagles, gulls, ravens, dogs and even rare mammals like fishers have been observed ripping into beach-cast carcasses.



Map: Bovy et al. 2016
Photo: Courtesy of the Museum of Anthropology, Washington State University.

The people who lived at Minard utilized both marine and estuarine resources, including marine birds. We've highlighted the range of Pacific Northwest COASST beaches used for comparison in this study.

These Cassin's Auklets, documented in the wreck of 2014-15, are largely intact. By contrast, some species are found more often as "just wings" like the Green-winged Teal shown here. Small ducks may have been one of the favorite foods of the people living at Minard, and they are also a clear favorite of raptors like Peregrine Falcons, who leave wings on the high beach for COASSTers to find.

Photos: (Above) J. Forsythe/COASST
(Left) B. Wood/COASST

Hunting or Scavenging?

Did coastal peoples give these predators a run for their money, beating them to freshly deposited carcasses? Maybe. It's also a good bet that these communities were very in touch with the seasonal cycles of the marine environment. They probably knew when to anticipate the post-breeding spike of Common Murres, or the migration and winterkill spike of Northern Fulmars. Looking at the seasonal predictability of carcass deposition, as well as the "intact signal" during mass mortality (or wreck) events is the next project our team plans to tackle.

For now, we're happy to let COASSTers know that the deep, rich and highly accurate dataset amassed by Pacific Northwest COASSTers has allowed a significant advancement in how archaeology professionals now understand the options open to ancient indigenous peoples. No doubt they hunted. And no doubt they were savvy about where and when the weather and tides would bring fresh seabirds to shore.

If you want to read the complete article by Kris, Jessica, Julia and former COASST Science Coordinator Jane Dolliver, "*Distinguishing offshore bird hunting from beach scavenging in archaeological contexts: The value of modern beach surveys*" published in the Journal of Archaeological Science in April 2016, please contact the COASST office and we'll sent you a copy!

Kris examines a bone found at Minard.

Distinguishing offshore bird hunting from beach scavenging in archaeological contexts: The value of modern beach surveys. K.M. Bovy. J.E. Watson. J. Dolliver & J.K. Parrish. Journal of Archaeological Science 2016 70:35-47.

Science Update **is a special publication of the Coastal Observation and Seabird Survey Team (COASST) highlighting recent research and scientific publications.**

Written by Julia K. Parrish
Produced by Erika Frost

COASST
University of Washington
Box 355020
Seattle, WA 98116
coasst@uw.edu
206-221-6893
www.coasst.org

Mission

The Coastal Observation and Seabird Survey Team (COASST) is a citizen science project of the University of Washington in partnership with state, tribal and federal agencies, environmental organizations, and community groups. COASST believes citizens of coastal communities are essential scientific partners in monitoring marine ecosystem health. By collaborating with citizens, natural resource management agencies and environmental organizations, COASST works to translate long-term monitoring into effective marine conservation solutions.

Vision

Realizing the pressing needs of marine natural resource management and coastal conservation, and the twin benefits of increasing science literacy and an environmental stewardship ethic among citizens, COASST sees a future in which all coastal communities contribute directly to monitoring their local marine resources and ecosystem health through the establishment of a network of citizens engaging in science, where all collect rigorous and vital data. Through their collective efforts, and the translation of their individual data into baselines against which any impact—from human or natural origins—can be assessed, nearshore ecosystems worldwide will be actively known, managed, and protected.