Collaborative citizen science program started in 1997

- Began in Monterey Bay region (North); expanded to central region; southern region added 2013
- As of May 2019: 100+ active volunteers

Goal: Use deposition as index of health of sanctuary

- Detects on 2-3 UMEs each year
- Informs management if UME human-caused
- Informs condition reporting for protected species and human impacts
Collaborative effort to make BeachCOMBERS data publically available in the CeNCOOS & MBON data portals
New data portal puts BeachCOMBERS data at your fingertips

Summer 2019

Since 1997, trained volunteers of the Coastal Ocean Mammal and Bird Education and Research Surveys (BeachCOMBERS) program have walked each month to beaches in Monterey Bay National Marine Sanctuary on the lookout for the remains of washed up marine birds and mammals. Thanks to these dedicated volunteers, the BeachCOMBERS program now has over 20 years of baseline information on rates of deposition of beachcast birds and mammals on sanctuary beaches, which is used as an index of the health of the sanctuary. When the number of carcasses on beaches is much higher than usual, this is evidence of a mortality event and, on average, the BeachCOMBERS program has detected 2-3 events each year.

When sanctuary visitors encounter many dead seabirds or marine mammals on the beach, they may assume it is caused by human activity such as fishing, shipping, or pollution, but it may also be due to natural events, such as an El Niño. Determining if an event is natural or human-caused can be challenging, but additional information collected by BeachCOMBERS volunteers, such as noting which carcasses are covered in oil, entangled in fishing gear, or associated with trash, and collecting specimens for analyses, can help wildlife experts and managers determine the cause.

For example, the BeachCOMBERS program detected unusual mortality events of Common Murrels, a small black and white seabird. In 1991, 1994, 2007, and 2013, and BBS and helped determine that these events could be attributed to different causes. The mortality event in mid-1997 was linked to murres becoming entangled in gillnets, while El Niño conditions were a toxic, algal bloom within Monterey Bay caused the mortality event the following autumn and summer. In both 2013 and 2015, many of the dead and stranded Common Murres observed on beaches were juveniles in poor condition which was later linked to the prevalence of warm water and low prey conditions along the coast. The event in 2015 was especially large and linked to an extended marine heat wave (also known as “The Blob.”)

Annual deposition of Common Murres

Annual encounter rate of Common Murre adults on 11 core BeachCOMBERS beaches in Monterey Bay. Time series graphs created using CeNCOOS data portal.

In addition to helping detect and differentiate human and naturally caused events, BeachCOMBERS data have helped the sanctuary answer questions on the status of endangered seabirds and mammals, and the impacts of changing ocean conditions (e.g., El Niño, harmful algal blooms), and impacts from human activities (shipping entanglements, marine debris, oiling) in the 1997 and 2017 MRMS condition reports.

The BeachCOMBERS program recently turned 20 and to mark that important milestone released a 20-year report which is available on the BeachCOMBERS program website. This report is considered a living document that will be added to over the coming months.

Introducing the new CeNCOOS data portal

BeachCOMBERS data are available for everyone to explore through an on-line data portal hosted by the Central and Northern California Coastal Observing System. Using this data portal, created through a collaboration between Moss Landing Marine Laboratories, Office of National Marine Sanctuaries, the Marine Biodiversity Observation Network, CeNCOOS, and National Marine Fisheries Services Environmental Research Division, you can:

- View all beach segments being monitored or zoom in to the beaches of interest to you;
- Identify which seabirds and mammals are most commonly found on beaches;
- Explore when marine mammals and stranded murres have peaked;
- Compare BeachCOMBERS marine mammal observations to those collected by two partner programs, Greater Farallones National Marine Sanctuary’s Beach Watch and Humboldt State University’s Marine Mammal Stranding Program (Great Farallones);
- Compare seabird strandings across Greater Farallones, Monterey Bay, and Channel Islands to explore if the event is local or regional in extent (Farallones).

A tutorial is available to guide new users through the portal’s many features and show how to create some useful outputs, such as the example data views available through the links above.

What’s Next?

Now that seabird and marine mammal strandings data are available through the CeNCOOS portal, it is being used as a key indicator for tracking ecosystem health by NOAA’s California Current Integrated Ecosystem Assessment program and incorporated into the upcoming 2019 edition of the Ecosystem Status Report of the California Current. BeachCOMBERS data are being used as a model for developing dynamically updating critical parameters for future sanctuary condition reports. Additionally, the Southern California Coastal Ocean Observing System’s monthly California YAB Report is planning to incorporate BeachCOMBERS seabird stranding data from Santa Cruz to LA County.
Tiers of Data Products

Infographics
Task: information discovery
Audience: Public, managers, educators

Curated Data Views
Task: periodic information updates
Audience: Advisory groups, researchers, managers

Data portals
Task: data exploration
Audience: technical experts
BeachCOMBERS Data in Condition Reports

Animal Stranding and Oiling Rates

Bird and Mammal Monthly Deposition

Number Entangled Birds
Encounter rate (birds/km) of bird carcasses on beaches from WA to northern CA (left panel), north-central California (middle panel), and in central-southern California (right panel).
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Entangled Birds
Curated Data Views

- A web page that displays predetermined data, maps, images that are intended for display together
- Allows users limited customization of graph appearance
- More technical than interactive infographics
- Could be focused on specific management theme or topic

Test data view: Long-term monthly beach deposition rates:
https://data.cencoos.org/?ls=ab310e75-36d5-9f28-32d7-b74a2036e4fc#data/1

Test data view: The seven commonly encountered seabirds:
https://data.cencoos.org/?ls=4f0b256c-b807-3aeb-005e-9cfbbe58fc9#data/default

Test data view: The five most commonly encountered marine mammals:
https://data.cencoos.org/?ls=32e4b4c3-44c1-0aeb-8a81-f1daece10c0c#data/2

Test data view: Common Murre GFNMS, MBNMS, CINMS comparison
https://data.cencoos.org/?ls=508aa6ce-b7d7-0390-6b3a-71a531b23d4e#data/3

Test data view: California sea lion HSU, BW, BC monitoring program comparison
https://data.cencoos.org/?ls=6e5dfd27-3b38-9064-85ab-096321b21641#data/4
Tiers of Data Products

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Task: data exploration
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BeachCOMBERS data in portal

Patrick has created a BeachCOMBERS focused data portal tutorial.