

BeachCOMBERS reflections on seabird mortality events

BeachCOMBERS reflections on seabird mortality events



Jacqueline Lindsey¹, Emily Kelsey², Corinne Gible³, Erica Donnelly-Greenan^{1,4}, Hannah Nevins⁵, Scott Benson⁶, Robert McMorran⁷, James T. Harvey¹, and BeachCOMBERS volunteers

¹BeachCOMBERS, 8272 Moss Landing Rd, Moss Landing, CA 95039, jackieklindsey@gmail.com; ²U.S. Geological Survey, 400 Natural Bridges Drive Santa Cruz, CA 95060; ³California Department of Fish and Wildlife/Office of Spill Prevention and Response, 1451 Shaffer Road Santa Cruz, CA 95060; ⁴Oikonos Ecosystem Knowledge, 151 McAllister Way, Santa Cruz, CA 95060; ⁵American Bird Conservancy, P.O. Box 249 4249 Loudoun Ave. The Plains, VA 20198; ⁶National Oceanic and Atmospheric Administration, 7544 Sandholdt Rd, Moss Landing, CA 95039 ⁷U.S. Fish and Wildlife Service, 2493 Portola Rd. Suite B Ventura, CA 93003

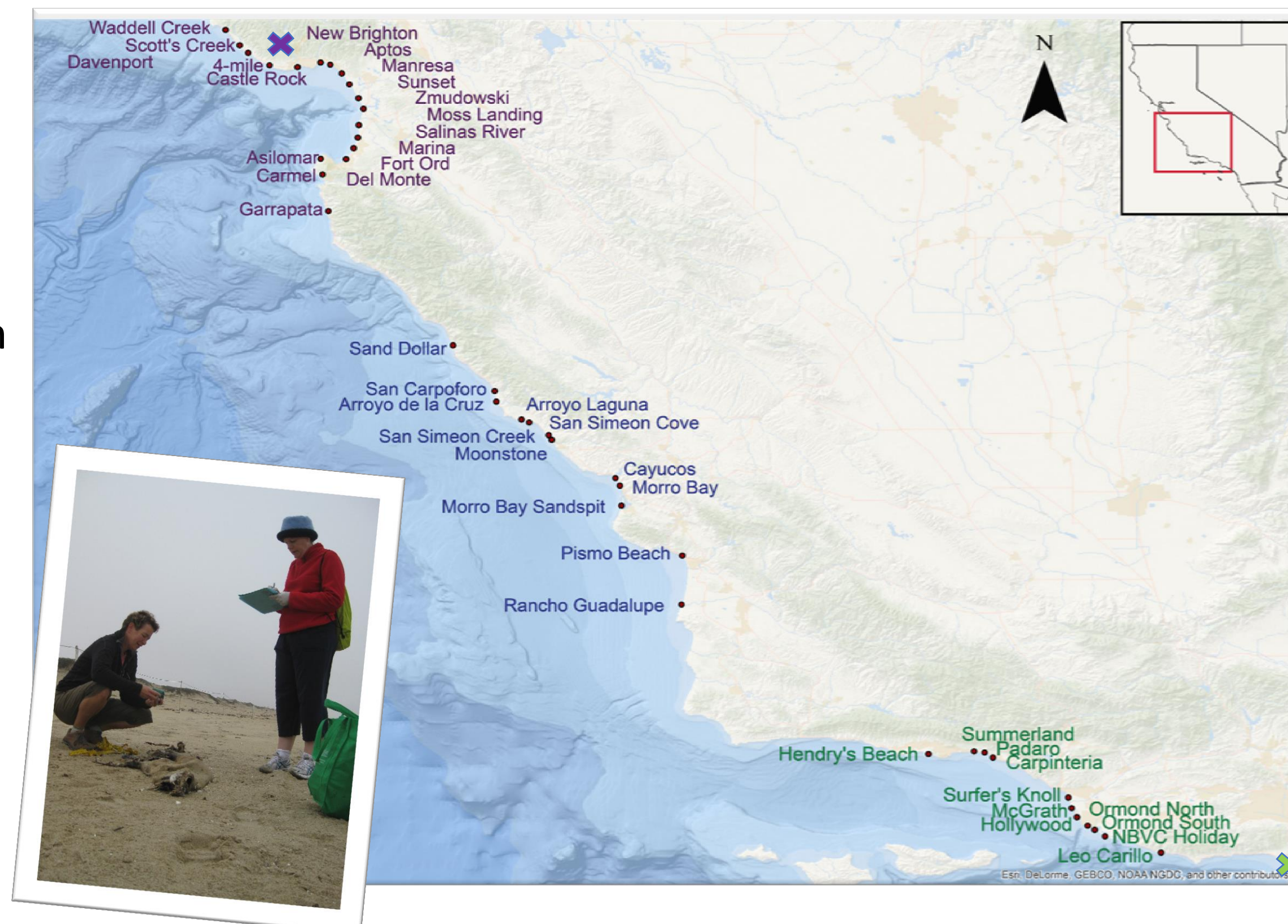
Background

BeachCOMBERS (Coastal Ocean Mammal and Bird Education and Research Surveys) conducts standardized monthly surveys of beachcast marine birds and mammals in Central and Southern California to assess trends in deposition and assist in the early detection of natural and anthropogenic mortality events.

113 trained volunteers survey 112 km of beaches between Santa Cruz and Los Angeles, CA (see map below).

Methods:

- Volunteers survey in pairs, once each month
- They record data on each bird or mammal they encounter, including:
 - Species, sex, age, oiling
 - External findings suggesting cause of death
 - Number of encounters (beach retention)
- Fresh carcasses are collected for necropsy at the Marine Wildlife Veterinary Care and Research Center (MWVCRC) in Santa Cruz
- In 2013 South Coast region joined the program
 - Natural oil seeps are more common in this region
 - Oil sampling and notation of oil on beach segments began in 2013



Do oiled beaches always lead to oiled birds?

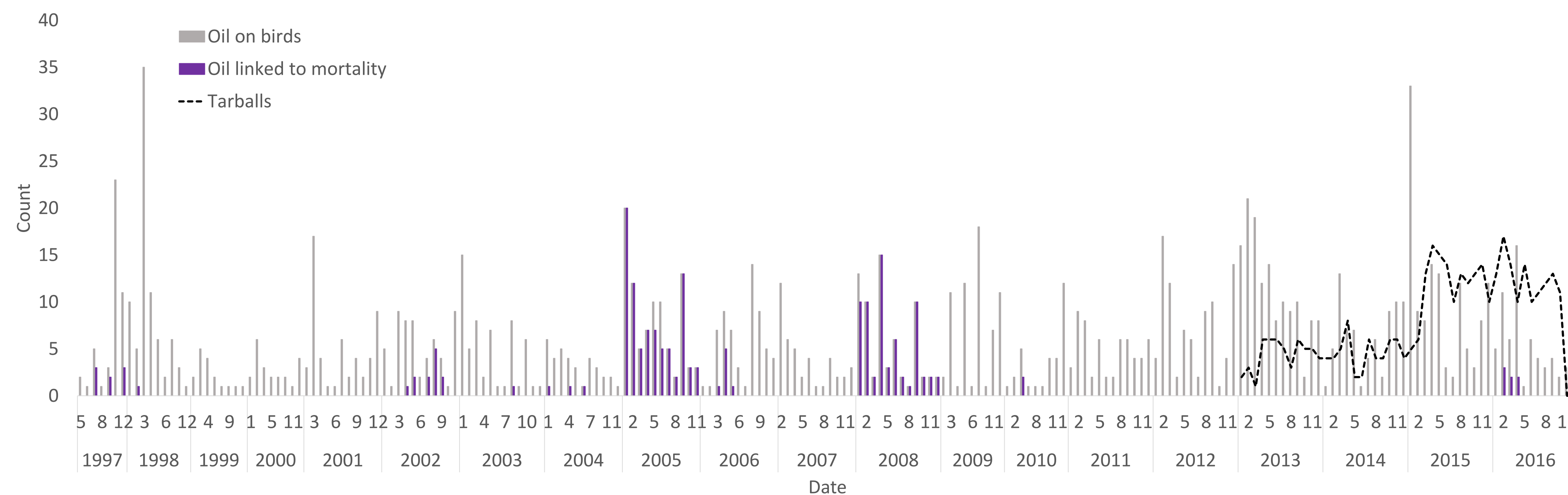


Fig. 1: Time series of oiled birds recorded each month (grey), oiled birds where the cause of death was thought to be linked to oil (purple), and tarballs recorded since 2013 (dashed).

- Oiled birds have been recorded since 1997
 - Oil is noted as a suspected contributing factor to cause of death when birds appear to have been floating alive (upright) in oil
 - More oiled birds are found during winter surveys
- Tarballs have been recorded on surveys since 2013

Take-away: Oiled birds are not found more frequently when more tarballs are reported



Effort-based surveys detect major die-off events

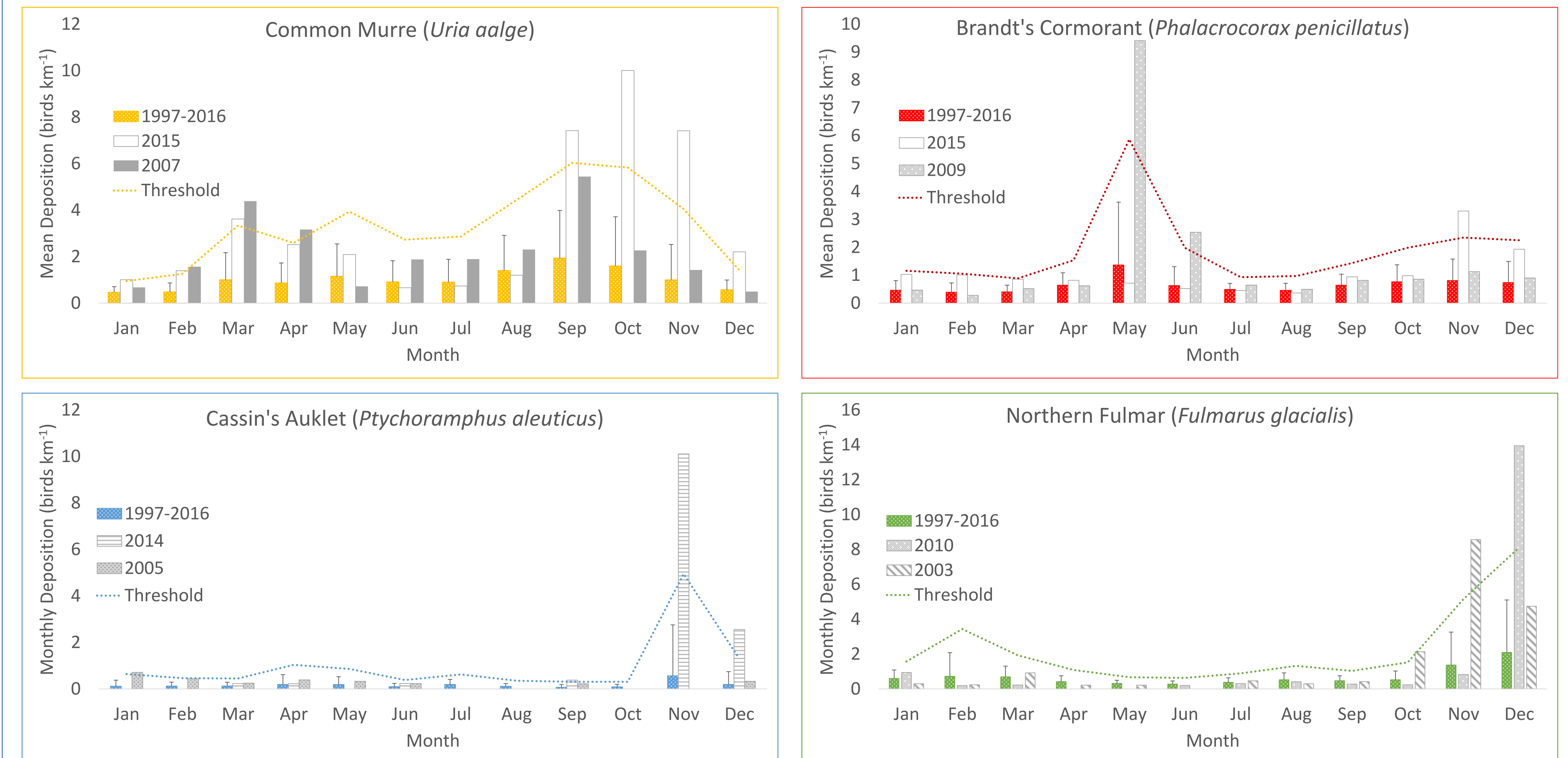


Fig. 2: Mean monthly deposition per km for four species that experienced major mortality events in the last seven years: Common Murre, Brandt's Cormorant, Cassin's Auklet, and Northern Fulmar. Separate bars are depicted for the long-term average (with standard deviation) and years with a mortality event. Threshold for a die-off event (dashed line) is twice the standard deviation.

Collaboration with Marine Wildlife Veterinary Care and Research Center

NAME	DATES	GROSS FINDINGS	AGE CLASS	NO. EXAMINED
Common Murre 2015	Aug-Jan	Emaciation, potential HAB interaction (tests pending)	After hatch year majority	41*
Brandt's Cormorant 2015	Aug-Sep	Emaciation	Young of the year	10
Cassin's Auklet 2014	Oct-Dec	Emaciation	Hatch year/ immature majority	32
Northern Fulmar 2010	Nov	Emaciation, plastics	Hatch year	34
Brandt's Cormorant 2009	Apr-Jul	Emaciation	Adults majority	54
Common Murre 2007	Mar	Emaciation	Immature majority	44

Table 1: Major findings of the necropsies of seabirds collected during major die-offs. Colors (yellow, red, blue, and green) link necropsy findings to species in Fig. 2. *Necropsy assistance by USGS National Wildlife Health Center.

- Gross finding of emaciation can indicate limited prey abundance, increased competition for food, or a failure at seabird breeding colonies
- Harmful algal bloom toxin level detection can indicate that additional health factors contributed to the decline and eventual mortality of seabirds

Take-away: Post-survey necropsy results link each die-off to base causes



What's next for BeachCOMBERS?

- Online visualization of monthly data trends will allow anyone timely access to detection of major die-offs.
- Continued collaboration with MWVCRC will continue to improve our understanding of the causes of die-offs.
- Expansion of standardized oil monitoring on beach surveys will provide baseline comparison for surveys conducted during oil spills, particularly on southern California beaches where natural oil seeps are common.

Major funding and support:

