

Levels of persistent organic pollutants in blubber of free-ranging bottlenose dolphins (*Tursiops truncatus*) off Southern California

Nathan Dodder, Southern California Coastal Water Research Project
David Weller, Southwest Fisheries Science Center, NOAA Fisheries
Gina Ylitalo, Northwest Fisheries Science Center, NOAA Fisheries
Bernadita Anulacion, Northwest Fisheries Science Center, NOAA Fisheries
Nicholas Kellar, Southwest Fisheries Science Center, NOAA Fisheries
John Hyde, Southwest Fisheries Science Center, NOAA Fisheries
Gregory Campbell, Scripps Institution of Oceanography
Keith Maruya, Southern California Coastal Water Research Project
Wayne Perryman, Southwest Fisheries Science Center, NOAA Fisheries

Persistent organic pollutants (POPs) are widely distributed in the Southern California Bight (SCB) marine environment. High concentrations of these chemicals have been found in sediments and a variety of marine organisms. Little is known, however, about the occurrence of these contaminants in SCB coastal and offshore bottlenose dolphins (*Tursiops truncatus*). To address this issue, 37 blubber biopsies from free-ranging dolphins were collected and analyzed for POPs. The analytes examined included dichlorodiphenyltrichloroethane (DDT) and related breakdown products, polychlorinated biphenyls (PCB), polybrominated diphenyl ethers (PBDE), chlordanes, and other organochlorine pesticides. The goals of this research were to: (1) compare contaminant concentrations found in SCB dolphins to dolphins in other locations, (2) determine if differences in contaminant profiles (type and abundance) existed between coastal and offshore dolphin ecotypes in the SCB, and (3) examine possible toxic effects thresholds. Results show maximum concentrations for each contaminant class, including significantly higher concentrations of PCBs, generally occurred in coastal dolphins. Maximum concentrations were primarily in males, likely as a result of contaminant off-loading in parturient females. The nearshore distribution of coastal dolphins (generally within 1–2 km of land) places them in near proximity to contaminant discharges and may explain the higher PCB concentrations observed. The relative abundance of individual contaminants was for the most part not significantly different between the two ecotypes, suggesting a yet to be determined vector of chemical transport between the coastal and offshore environment. Contaminant concentrations found in SCB bottlenose dolphins were generally on the high end of the observed range for levels reported from other areas with PCB concentrations exceeding suspected toxic effects threshold values that are associated with negative health effects.

Correspondence: nathand@sccwrp.org

Western Pacific Ocean Sperm Whale Coda Repertoires

Elizabeth L. Ferguson, Cory A. Hom-Weaver, Kerry J. Dunleavy, and Thomas F. Norris

Sperm whales are highly social cetaceans that live in matrilineal family units and inhabit all ocean basins from the tropics to polar regions. They produce stereotyped patterns of 3 to 40 broadband clicks, termed "codas," that typically occur within a period of less than 3 seconds. Coda repertoires are unique for different sperm whale social units. These have been referred to as "dialects" and can be assigned to one of several larger social groups termed "vocal clans," which have been used to define sperm whale population structure. Extensive studies of vocal clans have been conducted in the eastern tropical Pacific Ocean (ETP), however little is known about sperm whale coda repertoires in the western Pacific Ocean. Codas can be classified into types according to the number and temporal pattern of the clicks. Rendell and Whitehead (2003) identified five vocal clans across the ETP and south Pacific oceans. The three dominant clans are termed "regular," "+1" and "short" based on the predominant coda type represented in the repertoire. We reviewed codas recorded from independent sperm whale groups that were acoustically and visually encountered during two marine mammal surveys in the Northern Mariana Islands and Palau regions, conducted in 2007 and 2012 respectively. Using the sperm whale click detector module and event identification modules in the acoustic processing software PAMGuard, we isolated and identified coda inter-click intervals for ten sperm whale groups from the Mariana Islands survey and three groups from the Palau survey. Three bioacousticians classified each coda to type. Codas that were not classified the same by two or more bioacousticians were excluded from further analysis. This qualitative process of identifying coda types resulted in large representation of the "regular" vocal clan. The identification of regular vocal clans within this region has implications for understanding the culturally-linked stock distribution and population structure of sperm whales in this region and across the Pacific Ocean. Several studies have evaluated the relationship between genetic variation and vocal repertoire to inform sperm whale stock management. To better understand the potential relationship between genetics and population structure of sperm whale stocks within the Pacific Ocean basin, we recommend future studies of sperm whales in the western Pacific Ocean that include genetic sampling paired with passive acoustic monitoring.

Correspondence: eferguson@bio-waves.net

SOUTHERN CALIFORNIA MARINE MAMMAL WORKSHOP

FEBRUARY 1-2, 2013 • NEWPORT BEACH, CA



Zalophus californianus

All photos credited to Robert Perry ©2013 www.CondorExpressPhotos.com

SPONSORED BY:



PROGRAM CONTENTS:

WORKSHOP SCHEDULE	(P. 1-2)
SPEAKER BIOGRAPHIES	(P. 3-10)
LIST OF ATTENDEES	(P. 11-15)
ACKNOWLEDGEMENTS	(P. 16)

APPENDIX 1: POSTER ABSTRACTS

APPENDIX 2: EVALUATION FORM