



## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

### HIGHLIGHTED ARTICLES

[Karakoram snowfall less sensitive to warming than Himalayas due to a unique seasonal cycle](#)

Nature Geoscience

[Estimation of hook selectivity of red snapper \(\*Lutjanus campechanus\*\) and vermilion snapper \(\*Rhomboplites aurorubens\*\) from fishery independent surveys of natural reefs of the northern Gulf of Mexico](#)

Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science

### ADDITIONAL ARTICLES

NMFS Publications

[Hierarchical population structure and habitat differences in a highly mobile marine species: the Atlantic spotted dolphin](#)

Molecular Ecology

[Using models of social transmission to examine the spread of longline depredation behavior among sperm whales in the Gulf of Alaska](#)

PLoSOne

[Spatial segregation and the influence of habitat on the foraging behavior of northern fur seals \(\*Callorhinus ursinus\*\)](#)

Canadian Journal of Zoology

[A small unmanned aerial system for estimating abundance and size of Antarctic predators](#)

Polar Biology

[Distribution and community structure of coastal sharks in the northeastern Gulf of Mexico](#)

Environmental Biology of Fishes





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

### OAR Publications

[Spatial and temporal trends in zooplankton assemblages along a nearshore to offshore transect in southeastern Lake Michigan from 2007-2012](#)

Journal of Great Lakes Research

[The changing width of earth's tropical belt](#)

Physics Today

[Volatile organic compound emissions from the oil and natural gas industry in the Uinta Basin, Utah: point sources compared to ambient air composition](#)

Atmospheric Chemistry and Physics

### NOS Publications

[In vitro exposure of DE-71, a penta-PBDE mixture, on immune endpoints in bottlenose dolphins \(\*Tursiops truncatus\*\) and B6C3F1 mice](#)

Journal of Applied Toxicology

### NESDIS Publications

[The World Ocean Atlas 2013: higher horizontal and vertical resolution for regional and global ocean and climate studies](#)

EOS by the American Geophysical Union

### Joint Line Office Publications

[A protocol for coordinating post-tsunami field reconnaissance efforts in the USA](#)

Natural Hazards

## **OTHER REPORTS, BOOK CHAPTERS, AND INTERNAL PUBLICATIONS**

[International Tsunami Survey Team \(ITST\) Post-Tsunami Survey Field Guide, 2<sup>nd</sup> Edition](#)

Intergovernmental Oceanographic Commission Manuals and Guides





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

### HIGHLIGHTED ARTICLES

*Karakoram snowfall less sensitive to warming than Himalayas due to a unique seasonal cycle*  
Nature Geoscience (11.668)

S. Kapnick, **T. Delworth (OAR/GFDL)**, M. Ashfaq, S. Malyshev, and C. Milly

- Results with this model show that the Karakoram seasonal cycle, dominated by non-monsoonal winter precipitation, uniquely protects it from reductions in annual snowfall under climate warming over the twenty-first century.
- The simulations show that climate signals are detectable only with long and continuous records, and at specific elevations.
- These results provide a meteorological mechanism for regional differences in glacier response to climate warming.

The high mountains of Asia combine to form a region of perplexing hydroclimate changes but the remote location, complex terrain, and multi-country fabric of high-mountain Asia have made it difficult to maintain long-term monitoring systems of the meteorological components that can influence glacial change. Glaciers have exhibited mass stability or even expansion in the Karakoram region, in contrasting to glacial mass loss across the nearby Himalayas and Tibetan Plateau, suggesting that different regional snowfall or temperature signals might be detected. The authors use a high-resolution climate model (GFDL's CM2.5), compared with the latest available observing systems, to investigate how these mountains exhibit distinct seasonal cycles and resulting climate change signatures. CM2.5 reproduces the seasonal cycle of high elevation hydroclimate across high-mountain Asia better than any of the models in IPCC AR5. Outside of the Karakoram, the rest of the Himalaya exhibits a more monsoonal seasonal cycle (precipitation falling mainly during the summer); its annual snowfall is therefore more sensitive to warming as temperatures rise above freezing precisely when the majority of precipitation falls.

Expected Publication Date: 19 October 2014





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

*Estimation of hook selectivity of red snapper (*Lutjanus campechanus*) and vermilion snapper (*Rhomboplites aurorubens*) from fishery independent surveys of natural reefs of the northern Gulf of Mexico*

Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science (1.810)

**M.D. Campbell, A.G. Pollack, W.B. Driggers, and E.R. Hoffmayer (NMFS/SEFSC)**

- For both red and vermilion snapper, there were significant differences in mean fork length by hook size, broad length-frequency distributions, and wide selectivity curves.
- Results suggest that using hook-size regulations might be a useful management strategy to target desired size classes for these two snapper species, but the broadly overlapping length distributions indicate that undersized catch would not be eliminated.
- Right skewed distributions generally fit the data best, suggesting that hook regulations are likely to be more effective if the desired goal is to reduce the amount of undersized catch by eliminating small hook sizes.

Implementation of circle hook regulations in the Gulf of Mexico will impact the length- and age-structure of catch in the snapper-grouper fishery as well as demographic data that feeds into stock assessments, and therefore selectivity patterns for these hooks are critical to understand. Results of the indirect selectivity analysis of vertical-line catch of red snapper (*Lutjanus campechanus*) and vermilion snapper (*Rhomboplites aurorubens*) showed that for both species there were significant differences in mean fork length by hook size, broad length-frequency distributions, and wide selectivity curves. While these results suggest that using hook-size regulations might be a useful management strategy to target desired size classes for these two snapper species, the broadly overlapping length distributions indicate that undersized catch would not be eliminated. The selectivity curves generated from the different families of distributions produced equally good fits to the data and provide a basis to evaluate various selectivity curves when the size structure of the population being sampled is unknown. If the size-structure of the sampled population is known use of direct-selectivity methods is encouraged. Right skewed distributions generally fit the data best, suggesting that hook regulations are likely to be more effective if the desired goal is to reduce the amount of





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

undersized catch by eliminating small hook sizes. Conversely, elimination of large hooks appears to be less likely to reduce catch of larger size classes because mouth gape is likely the primary limiting factor and small hooks can catch large fish. Catch rates were significantly different by hook size, and thus regulations based on hook size could impact fishing effort and change the dynamics of how the snapper-grouper fishery is prosecuted. Tradeoffs between moderate improvement in size-class targeting, changing effort, and the various components of fishing mortality (i.e. catch and regulatory discards) need further investigation through simulation modeling or field experimentation.

Accepted: 19 September 2014

### ADDITIONAL ARTICLES

#### NMFS Publications

*Hierarchical population structure and habitat differences in a highly mobile marine species: the Atlantic spotted dolphin*

Molecular Ecology (5.84)

A. Vircel and **P. E. Rosel** (NMFS/SEFSC)

- Genetic data suggest Atlantic spotted dolphins in the NW Atlantic are made up of two genetically differentiated groups and the two types in the NW Atlantic may deserve sub-specific status.
- The single stock currently delimited in US waters of the NW Atlantic should be split into two stocks based on these results.
- The results suggest there may also be two stocks instead of just one in the Gulf of Mexico.

Recent molecular studies have shown that highly mobile species with continuous distributions can exhibit fine-scale population structure. In this context, we assessed genetic structure within a marine species with high dispersal potential, the Atlantic spotted dolphin (*Stenella frontalis*). Using 19 microsatellite loci and mitochondrial control region sequences, population structure was investigated in the western North Atlantic, the Gulf of Mexico and the Azores Islands. Analyses of the microsatellite data identified four distinct genetic clusters, which were





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

supported by the control region sequences. The highest level of divergence was seen between two clusters corresponding to previously-described morphotypes that inhabit oceanic and shelf waters. The combined morphological and genetic evidence suggests these two lineages are on distinct evolutionary trajectories and could be considered distinct subspecies despite their parapatry. Further analysis of the continental shelf cluster resulted in three groups: animals inhabiting shelf waters in the western North Atlantic, the eastern Gulf of Mexico, and the western Gulf of Mexico. Analyses of environmental data indicate the four genetic clusters inhabit distinct habitats in terms of depth and sea surface temperature. Contemporary dispersal rate estimates suggest all of these populations should be considered as distinct management units. Conversely, no significant genetic differentiation was observed between *S. frontalis* from offshore waters of the western North Atlantic and the Azores, which are separated by approximately 4500 km. Overall, the hierarchical structure observed within the Atlantic spotted dolphin shows that the biogeography of the species is complex because it is not shaped solely by geographic distance.

Published (online): September 2014

<http://onlinelibrary.wiley.com/doi/10.1111/mec.12923/pdf>

*Using models of social transmission to examine the spread of longline depredation behavior among sperm whales in the Gulf of Alaska*

PLoS One (3.534)

Z. A. Schakner, C. Lunsford (NMFS/AFSC), J. Straley, T. Eguchi (NMFS/SWFSC), and S. L. Mesnick (NMFS/SWFSC)

- Results suggest that depredation by sperm whales in southeast Alaska is accelerating through social transmission among sperm whales in SE Alaska.
- Fishing methods and management regulations likely influence the onset and spread of the behavior through the region.
- Mitigation is most likely to be effective in the early stages of innovation.

Fishing, farming and ranching provide opportunities for predators to prey on resources concentrated by humans, a behavior termed depredation. In the Gulf of Alaska, observations of sperm whales depredating on fish caught on demersal longline gear dates back to the 1970s, with reported incidents increasing in the mid-1990s. Sperm whale depredation provides an opportunity to study the spread of a novel foraging behavior within a population. Data were



Photo Credit: Distraction Charters



## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

collected during National Marine Fisheries Service longline surveys using demersal longline gear in waters off Alaska from 1998 to 2010. The authors evaluated whether observations of depredation fit predictions of social transmission by fitting the temporal and spatial spread of new observations of depredation to the Wave of Advance model. They found a significant, positive relationship between time and the distance of new observations from the diffusion center ( $r^2 = 0.55$ ,  $p$ -value = 0.003). The data provide circumstantial evidence for social transmission of depredation. This paper discusses how changes in human activities in the region (fishing methods and regulations) have created a situation in which there is spatial-temporal overlap with foraging sperm whales, likely influencing when and how the behavior spread among the population.

Expected Publication Date: Fall 2014

*Spatial segregation and the influence of habitat on the foraging behavior of northern fur seals (Callorhinus ursinus)*

Canadian Journal of Zoology (1.65)

**C. E. Kuhn, R. Ream, J. Sterling, J. Thomason, and R. G. Towell (NMFS/AKFSC)**

- This study re-examined foraging habitat segregation within and between northern fur seal colonies after a significant population decline. This information is critical to shape management strategies for the declining population.
- The study found that although fur seal numbers have declined by approximately 40% there were few changes in habitat segregation and that the foraging habitat used plays a significant role in shaping differences in dive behavior within and between island colonies.

Central place foraging by colonial breeders can lead to depleted prey resources around breeding areas. Segregation of foraging areas both within and between large colonies may act as a mechanism to reduce competition for prey resulting in increased foraging success. We re-assessed horizontal (spatial) foraging habitat segregation for northern fur seals (*Callorhinus ursinus*, Linnaeus, 1758) within and between colonies on the Pribilof Islands, Alaska (St. Paul and St. George Islands) after the population declined by approximately 40%. In addition, we examined vertical habitat segregation, where foraging ranges overlapped, and describe the influence of different foraging habitats on northern fur seal dive behavior. Spatial habitat segregation in northern fur seal foraging areas occurred between islands but was variable within





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

islands, which is similar to the pattern previously described. There was no evidence for vertical habitat segregation when fur seals from different rookeries on St. George Island used the same foraging area. In addition, fur seals from St. Paul Island rookeries that foraged in similar habitats showed fewer differences in dive behavior indicating that foraging habitat plays a significant role in shaping dive behavior. The use of multiple foraging strategies within the Pribilof Island fur seal population could indicate a complex management and conservation strategy may be necessary to stop the continuing decline of this population.

Accepted: 12 August 2014

*A small unmanned aerial system for estimating abundance and size of Antarctic predators*  
Polar Biology (1.91)

**M. Goebel, W. Perryman, J. Hinke, D. Krause, N. Hann, S. Gardner, and D. LeRoi**  
(NMFS/SWFSC)

- This paper reports on the first use of Unmanned Aerial Systems hexacopters in the Antarctic for abundance estimation of krill-dependent predators and emphasizes the versatility of these valuable tools in addressing NOAA and SWFSC missions.
- Several characteristics of small, battery powered VTOLs make them particularly useful in wildlife applications: 1) portability, 2) stability in flight, 3) limited launch area requirements, 4) safety, and 5) limited sound when compared to fixed-wing and ICE aircraft.

Quantifying the distribution and abundance of predators is integral to many ecological studies, but can be difficult in remote settings like Antarctica. Recent advances in the development of Unmanned Aerial Systems (UAS), particularly with vertical-take-off and landing (VTOL) aircraft, have provided a new tool for studying the distribution and abundance of predator populations. We present our experience in selecting a VTOL platform for use in remote, windy settings and results from the first use of VTOLs for estimating abundance of krill-dependent predators in Antarctica. We report on 65 missions flown in 2010/11 (n=28) and 2012/13 (n=37) to estimate penguin and fur seal abundance, colony area and density. We also report on the utility of VTOLs for missions other than abundance and distribution, namely to estimate size of individual leopard seals. Several characteristics of small, battery powered VTOLs make them particularly useful in wildlife applications: 1) portability, 2) stability in flight, 3) limited launch area requirements, 4) safety, and 5) limited sound when compared to fixed-wing and ICE





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

aircraft. We conclude that of the numerous UAS available, electric VTOLs are among the most promising for ecological applications.

Expected Publication Date: January 2015

### *Distribution and community structure of coastal sharks in the northeastern Gulf of Mexico*

Environmental Biology of Fishes (1.31)

**D. M. Bethea, M. J. Ajemian, J. K. Carlson, E. R. Hoffmayer, J. L. Imhoff, R. D. Grubbs, C. T. Peterson, and G. H. Burgess (NMFS/SEFSC)**

- Study quantifies coastal shark abundance and community structure across several regions of the northeast Gulf of Mexico.
- The coordinated large-scale sampling effort indicates potential nursery areas as well as the fact that young shark assemblage patterns can be explained by regional scale habitat characteristics.

Coastal shark abundance and community structure were quantified across 10 geographic areas in the northeastern Gulf of Mexico using fishery-independent gillnet data from 2003-2011. A total of 3,205 sets were made in which 14,244 carcharhiniform sharks, primarily juveniles, were caught comprising 11 species from three families. The three most abundant species, Atlantic sharpnose sharks (*Rhizoprionodon terraenovae*), bonnethead (*Sphyrna tiburo*) and blacktip sharks (*Carcharhinus limbatus*), were not restricted to any specific geographic area; however, several species were only caught in one area or over a select group of areas (e.g., bull sharks in Mobile Bay, blacknose sharks outside of barrier islands and the SAB-CIS-SJB complex, and sandbar sharks on the Gulf of Mexico-side of St. Vincent Island). Due to the large number of immature sharks collected in this study and the consistent inter-annual use by juvenile sharks, some of these areas could be considered important nursery areas for several shark species. The results of this study revealed geographic area to significantly influence shark species-life stage assemblages while season did not. Additionally, environmental data and shark community assemblage were weakly but significantly correlated with the combination of salinity and turbidity. Species diversity varied by geographic area, but was generally highest in areas with the greatest amount of fresh and saltwater fluctuations. The mean size of the three most abundant species differed across geographic areas; Atlantic sharpnose were smallest in Mississippi Sound, bonnethead were smallest in the SAB-CIS-SJB complex, and blacktip shark were smallest in Apalachee Bay. Those species in lower abundances also differed by size across regions, but exhibited no discernible pattern. Our results suggest that riverine inputs may affect





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

juvenile shark assemblages across similar latitudes, Atlantic sharpnose and blacktip shark were not restricted to any specific geographic area but species such as bull (*C. leucas*), spinner (*C. brevipinna*), blacknose (*C. acronotus*), finetooth (*C. isodon*), sandbar (*C. plumbeus*) and scalloped hammerhead (*S. lewini*) sharks were only consistently captured within a single area or over a select group of areas.

Accepted: 17 September 2014

### OAR Publications

*Spatial and temporal trends in zooplankton assemblages along a nearshore to offshore transect in southeastern Lake Michigan from 2007-2012*

Journal of Great Lakes Research (1.771)

**S. A. Pothoven and G. L. Fahnenstiel (OAR/GLERL)**

- While zooplankton assemblages vary along a nearshore to offshore transect, at all depths, zooplankton biomass has declined relative to 1970s/1980s.
- These data are important for modeling secondary production available to support fish production.

Zooplankton were collected at a nearshore, a mid-depth and an offshore site near Muskegon, Michigan during March-December in 2007-2012. On a volumetric basis, biomass was lower at the nearshore site relative to the mid-depth site, but overall biomass at the nearshore and offshore sites did not differ. On an areal basis, overall biomass of zooplankton increased with depth of site. Differences in zooplankton assemblages among sites were due largely to Diaptomidae, *Limnocalanus macrurus*, *Daphnia galeata mendotae*, *Cyclops*, and either *Bosmina longirostris* or *Bythotrephes longimanus*. Diaptomidae were the most abundant group, accounting for 56-66% of zooplankton biomass across sites. Herbivorous cladocerans accounted for 14-22% of zooplankton biomass, with *B. longirostris* dominate at the nearshore site and *D. g. mendotae* at the mid-depth and offshore sites. *Bythotrephes* was the most abundant predatory cladoceran at all sites, although it was only abundant in the fall at the nearshore site. The higher percentage of large-bodied zooplankton groups in the offshore and mid-depth zones relative to the nearshore suggest higher planktivory pressures in the nearshore.





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

Declines in zooplankton biomass relative to historical levels have occurred across all sites and appear related to oligotrophication of the lake. In addition to seasonal variation, we noted annual variation, especially at the offshore site, with the zooplankton assemblage during 2007-2008 differing from that found in 2010-2012 due in part to increases in *D. g. mendotae* and *Cyclops* and decreases in *B. longimanus* and *L. macrurus*.

Expected Publication Date: Winter 2014 - Spring 2015

### *The changing width of earth's tropical belt*

T. Birner, **S. M. Davis**, and **D. J. Seidel** (OAR/ARL)

Physics Today (5.648)

- Efforts to map and understand the tropical belt date back to the 17th century.
- This paper describes the fundamental physics governing atmospheric circulation patterns that determine the tropical belt and discusses the challenges associated with locating the edges of the belt and determining its changing width.

The width of the tropical belt results from a delicate balance among different aspects of Earth's climate system. Only parts of the problem are well explained by simple physical theories, and a unique and cogent notion of the precise width of the tropics is elusive. Over the past decade, observation-based studies have uncovered strong evidence of a poleward expansion of the tropical belt over the past approximately 35 years. Projections of future changes in the width of the tropics are uncertain.

Expected Publication Date: 1 December 2014

### *Volatile organic compound emissions from the oil and natural gas industry in the Uinta Basin, Utah: point sources compared to ambient air composition*

Atmospheric Chemistry and Physics (5.298)

**C. Warneke**, F. Geiger, P. M. Edwards, **W. Dubé**, **G. Pétron**, **J. Kofler**, A. Zahn, **S. S. Brown**, Martin Graus, **J. Gilman**, B. Lerner, **J. Peischl**, T. B. Ryerson, **J. A. de Gouw**, and **J. M. Roberts** (OAR/ESRL).





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

- This study revealed where the largest emissions are coming from, and that, in turn, helps industry identify what they can do to reduce emissions as cheaply and effectively as possible.
- Measurements were in general agreement with previous emissions "inventories," which are estimates of emissions based primarily on well counts and production data.

Oil and natural gas production fields can emit large amounts of air pollutants that affect climate and air quality—but tackling the issue has been difficult because little is known about what aspects of complex production operations leak what kinds of pollutants, and how much. This study sheds light on just that, pinpointing sources of airborne pollutants in oil production fields in Utah's Uinta Basin. The study shows that in the Uinta Basin, equipment located on well pads—such as condensate tanks, dehydrators, and pumps—are key sources of pollutants. It also found that well operations frequently emit high levels of benzene and toluene (air toxics), and that emissions vary by production method. For example, dehydrating gas on-site (at the well pad) leads to higher emissions of VOCs than dehydration carried out off-site at a centralized facility. The study is one of the first to use fast-response and highly sensitive instruments to measure VOCs from individual gas and oil well pads and other point sources. To collect the data, the authors, in February 2012, drove an instrumented van downwind of 38 gas wells, 12 oil wells, one newly producing well, one refractured well with a flowback pond and 17 other point sources such as evaporation ponds, storage tanks and compressor stations. The mobile laboratory approached closer than 300 feet of most sources, measuring the VOCs in the air. The scientists found high ambient levels of benzene and toluene (another air toxic) at specific sites in the basin, with measurements reaching up to 1,000 parts per billion (1 part per million) by volume. In urban areas, values are closer to 0.1 to 0.2 parts per billion by volume.

Accepted: 18 September 2014

### NOS Publications

*In vitro exposure of DE-71, a penta-PBDE mixture, on immune endpoints in bottlenose dolphins (*Tursiops truncatus*) and B6C3F1 mice*





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

Journal of Applied Toxicology (3.174)

J. R. Wirth, M. M. Peden-Adams, N. D. White, G. D. Bossart, and **P. A. Fair**  
(NOS/NCCOS/CCEHBR)

- This study found that dolphin peripheral blood leukocytes (PBLs) displayed no alteration in Natural Killer (NK) cell activity or lymphocyte proliferation after in vitro exposure to environmentally relevant DE-71 contaminant concentrations.
- Mouse splenocytes NK cell activity response is more sensitive than dolphin PBLs after in vitro exposure, but mouse splenocytes and dolphins PBLs have a similar lymphocyte proliferation.

Polybrominated diphenyl ethers (PBDEs) are an emerging contaminant of concern with low level exposures demonstrating toxicity in laboratory animals and wildlife, though immunotoxicity studies have been limited. Bottlenose dolphin peripheral blood leukocytes (PBLs) and mouse splenocytes were exposed to environmentally relevant DE-71 (a penta-PBDE mixture) concentrations (0-50  $\mu\text{g ml}^{-1}$ ) in vitro. Natural killer (NK) cell activity and lymphocyte (B and T cell) proliferation were evaluated using the parallelogram approach for risk assessment. This study aimed to substantiate results from field studies with dolphins, assess the sensitivities between the mouse model and dolphins, and to evaluate risk using the parallelogram approach. In mouse cells, NK cell activity increased at in vitro doses 0.05, 0.5, and 25  $\mu\text{g DE-71 ml}^{-1}$ , while proliferation was not modulated. In dolphin cells, NK cell activity and lymphocyte proliferation was not altered after in vitro exposure. In vitro exposure of dolphin PBLs to DE-71 showed similar results to correlative field studies, NK cell activity in mice was more sensitive to in vitro exposure than dolphins, and the parallelogram approach showed correlation with all three endpoints to predict risk in bottlenose dolphins.

Expected Publication Date: October 2014

### NESDIS Publications

*The World Ocean Atlas 2013: higher horizontal and vertical resolution for regional and global ocean and climate studies*





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

EOS by the American Geophysical Union

**T. P. Boyer, H. E. Garcia, R. A. Locarnini, M. M. Zweng, A. V. Mishonov, J. R. Reagan, J.I. Antonov, O. K. Baranova, M. M. Biddle, M. Hamilton, D. R. Johnson, and C. R. Paver (NODC/NESDIS).**

- Article presents The World Ocean Atlas 2013. The atlas offers climatological mean fields calculated in a similar manner to previous versions but with higher resolution spatially and temporally.
- Models, climate studies, and oceanographic data quality control will all benefit from the improved spatial and temporal resolution of the World Ocean Atlas 2013. The atlas presents an improved baseline mean for important oceanographic variables.

There is ample evidence of the need for ocean modelling on horizontal grid scales greater than one-degree resolution (e.g. Penduff et al., 2010). Likewise, vertical resolution for isobaric coordinate models is important for realistic representation of ocean processes (Wang et al. 2008). As models increase their horizontal and vertical resolution, one problem is that long-term observational climatological means on a one-degree grid may not be sufficient initial and/or boundary conditions for these higher resolution models (e.g. Wakelin et al., 2009). Further, as studies of climate change focus on regional in addition to global cause and effect, long-term, higher-resolution mean fields of oceanographic variables are needed to better resolve near-coastal areas, processes, and features (Kim et al., 2007). The World Ocean Atlas 2013 provides higher resolution in the vertical and horizontal, as well as temporally.

Expected Publication Date: Fall 2014

### Joint Line Office Publications

*A protocol for coordinating post-tsunami field reconnaissance efforts in the USA*  
Natural Hazards (1.958)

**R. Wilson, N. Wood, L. Kong (NWS/ITIC), M. Shulters, K. Richards, P. Dunbar (NESDS/NGDC), G. Tamura, and E. Young (NWS/PR)**

- In order to improve the understanding of tsunamis and to develop tools and programs to mitigate their effects, it is vital to learn from past events.





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

- A protocol for coordinating post tsunami surveys hopefully will minimize the confusion and potential redundancies of post-event surveys, while also maximizing the efficiency and effectiveness of data-collection efforts by leveraging local knowledge and relationships.
- NGDC maintains the Long-term Tsunami Data Archive which allows scientists to assess the tsunami hazard, verify and validate models, and informs coastal mitigation and education efforts.

In the aftermath of a catastrophic tsunami, much is to be learned about tsunami generation and propagation, landscape and ecological changes, and the response and recovery of those affected by the disaster. Knowledge of the impacted area directly helps response and relief personnel in their efforts to reach and care for survivors and for reestablishing community services. First-hand accounts of tsunami-related impacts and consequences also help researchers, practitioners, and policy makers in other parts of the world that lack recent events to better understand and manage their own societal risks posed by tsunami threats. Conducting post-tsunami surveys and disseminating useful results to decision makers in an effective, efficient, and timely manner is difficult given the logistical issues and competing demands in a post-disaster environment. To facilitate better coordination of field-data collection and dissemination of results, a protocol for coordinating post-tsunami science surveys was developed by a multi-disciplinary group of representatives from state and federal agencies in the USA. This protocol is being incorporated into local, state, and federal post-tsunami response planning through the efforts of the Pacific Risk Management 'Ohana, the U.S. National Tsunami Hazard Mitigation Program, and the U.S. National Plan for Disaster Impact Assessments. Although the protocol was designed to support a coordinated US post-tsunami response, we believe it could help inform post-disaster science surveys conducted elsewhere and further the discussion on how hazard researchers can most effectively operate in disaster environments.

Published (online): 12 September 2014

<http://link.springer.com/article/10.1007%2Fs11069-014-1418-7>

### **OTHER REPORTS, BOOK CHAPTERS, AND INTERNAL PUBLICATIONS**

*International Tsunami Survey Team (ITST) Post-Tsunami Survey Field Guide, 2<sup>nd</sup> Edition*  
Intergovernmental Oceanographic Commission: Manuals and guides





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

D. Dominey-Howes and L. Dengler, editors; Working Group of Authors: J. Borrero, L. Dengler, D. Dominey-Howes, **P. Dunbar (NESDIS/NGDC/MGG)**, H. Fritz, F. Imamura, **L. Kong (NWS/ITIC)**, S. Koshimura, B. McAdoo, K. Satake, A. Yalciner, M. Yamamoto, and E. Yulianto

- This guide was prepared to assist Member States, scientists, authorities and community leaders in organizing and conducting post-tsunami field survey reconnaissance investigations.
- The First Edition of this Guide was published in 1998. This Second Edition represents a thorough revision in recognition of the developments that have taken place in the tsunami field since 1998, as well as the expansion of International Tsunami Survey Team efforts into disciplines not covered in the First Edition.
- The revision of the guide began in a sub-committee of the IUGG Joint Tsunami Commission. As such, this guide also represents a productive collaboration between the tsunami science community and the community of decision and policy-makers involved in the tsunami warning and mitigation systems.

The 1998 Post-Tsunami Field Guide (Manual & Guides No. 37) was published by the Intergovernmental Oceanographic Commission (IOC) to provide guidance for International Tsunami Survey Teams (ITSTs) conducting post event reconnaissance studies. This revision of the First Guide addresses developments in the tsunami field since 1998, and the expansion of ITST efforts into disciplines not covered in the first Guide. It also attempts to align ITST efforts within the United Nations and UNESCO natural hazards and risk reduction framework. The Guide provides a flexible framework for undertaking post-tsunami surveys, their guiding principles, and protocols, and a set of best practices and templates for individuals and groups considering forming, or participating, in post-tsunami surveys. The Field Guide is divided into three chapters. Chapter 1 outlines the rationale, purpose, and value of conducting field surveys. Chapter 2 deals with the mechanics of conducting post-tsunami field surveys and is divided into three subsections that outline the issues to be addressed *before*, *during* and *after* the survey is conducted. Chapter 3 outlines the types of data that can be collected, the types of equipment needed to gather that data, the methods available to researchers and where appropriate, recognizes best practices. In order to improve the understanding of tsunamis and to develop tools and programs to mitigate their effects, it is vital to learn from past events. NGDC





## NOAA SCIENTIFIC PUBLICATIONS REPORT SEPTEMBER 29, 2014

maintains the Long-term Tsunami Data Archive which allows scientists to assess the tsunami hazard, verify and validate models, and informs coastal mitigation and education efforts.

Available online:

[http://www.unesco.org/ulis/cgi-bin/ulis.pl?catno=229456&set=0054170E31\\_3\\_205&gp=1&lin=1&ll=1](http://www.unesco.org/ulis/cgi-bin/ulis.pl?catno=229456&set=0054170E31_3_205&gp=1&lin=1&ll=1)

