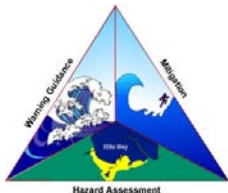


TsuInfo Alert

prepared by the Washington State Department of Natural Resources on behalf of the
National Tsunami Hazard Mitigation Program
a state/federal partnership funded through the National Oceanic and Atmospheric Administration (NOAA)

JUNE 2017

Volume 19, Number 3



NTWC Director Paul Whitmore Retires

By Kara Gately, National Tsunami Warning Center

In this issue:

NTWC Director
Paul Whitmore
Retires 1

Christa von
Hillebrandt-Andrade
Receives NOAA
Bronze Medal 2

Lori Dengler
Honored for
Tsunami and Seismic
Work 4

Paula Dunbar Retires
from NCEI 5

Research: Tsunami
Hazards in the PNW 5

Humboldt County
Tsunami App 6

12th Session of ICG/
CARIBE-EWS-XI
Held in Costa Rica 7

Multi-Hazard Early
Warning Conference 8

New Zealand
Palaeotsunami
Database 9

Current Tsunami
Research 10

NTHMP Upcoming
Events 10

Paul Whitmore has been Director of the National Tsunami Warning Center (NTWC) since 2002. He started his career at NTWC in 1986 after working in geophysical exploration for an oil company. While at NTWC, he has worked extensively on the following projects: automating seismic data processing and development of the Earlybird software, creation and development of the Alaska Tsunami Forecast Model (ATFM), and improvements to the warning center products, such as messaging and graphics. Paul has also served on the National Tsunami Hazard Mitigation Program (NTHMP) Coordinating Committee as a NOAA representative, and has been a Co-chair of the Warning Coordination Subcommittee since it was established in 2008.

In the time Paul has served as director at NTWC, the center has grown and major advancements in tsunami early warning have occurred. For example, 30 years ago, if there was an earthquake of large enough magnitude, a tsunami warning for the entire Pacific was issued. The message stated when the wave would arrive - and that was it. No ocean observations for detecting the tsunami, no coastal breakpoint sections for segmenting the warning, no advisory product, and no cancellation message. Since then, Paul has brought about major improvements to NTWC messaging products, including redefined tsunami alert levels (Watch/Warning/Advisory), and carefully crafted official bulletins containing clear information, all with the goal of improving public response.

As improvements in technology were made, the amount of real-time seismic and water level data brought into the center increased by orders of magnitude. This allowed for increased capabilities with the Earlybird software and improved analysis of earthquakes. It also paved the way for expanding the center's areas of responsibility. Further advancements brought about web graphics and GIS forecast products, along with capabilities to disseminate that information to core partners and emergency managers. Over the last decade, Paul has helped the center grow and is proud of NTWC's many positive contributions to the tsunami warning process.



Paul Whitmore, with Lois Varnado, during the 2017 NTWC Open House.



(Continues on page 3)

TsuInfo Alert

Prepared and published bimonthly by the Washington State Department of Natural Resources, Washington Geological Survey, on behalf of the National Tsunami Hazard Mitigation Program (NTHMP), a state/federal partnership funded through the National Oceanic and Atmospheric Administration (NOAA).

This publication is free upon request and is available in print by mail and online at:

<http://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/tsunamis/tsuinfo-alert>

**Assembled by Stephanie Earls, Librarian
Washington Geological Survey
Washington Dept. of Natural Resources**

1111 Washington St. SE, MS 47007

Olympia, WA 98504-7007

360-902-1473 (p) 360-902-1785 (f)

stephanie.earls@dnr.wa.gov



NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM LIBRARY CATALOG:

<http://d92019.eos-intl.net/D92019/OPAC/Index.aspx>

The views expressed herein are those of the authors and not necessarily those of NOAA, the Washington Department of Natural Resources, or other sponsors of TsuInfo Alert.

Christa von Hillebrandt-Andrade Receives NOAA Bronze Medal

By Rocky Lopes, NWS Tsunami Program Deputy

On May 23, 2017, Christa G. von Hillebrandt-Andrade, Manager, Caribbean Tsunami Warning Program, was awarded the highest honor granted by the Under Secretary of Commerce for Oceans and Atmosphere (aka "NOAA Administrator"). The bronze medal recognizes federal employees for superior performance.

Christa's medal citation was for "providing exceptional leadership that has resulted in a significant improvement in tsunami awareness and preparedness across the Caribbean Basin". This is a quite an honor and representative of what has been a remarkable effort by many to raise awareness of the tsunami risk in the Caribbean.

Christa's work in the Caribbean serving Puerto Rico, the U.S. Virgin Islands, and all nations in the region has been a great example of how one person's dedication to mission, when combined with a lot of great teamwork, can make a fundamental difference in how the world looks.

This recognition was exceptionally well-deserved and serves as a great example for all of us!



Benjamin Friedman, Acting NOAA Administrator (left), Christa von Hillebrandt-Andrade (center), and Dr. Louis W. Uccellini (right), the Director of the National Weather Service.

NTHMP NEWS

NTWC Director Paul Whitmore Retires

By Kara Gately, National Tsunami Warning Center

(Continued from page 1)

Many people do not realize that Paul wrote the original FORTRAN code for the ATFM, which was developed at NTWC. The ATFM was the first forecast model used operationally by the U.S. Tsunami Warning Centers (TWCs), and is still being used in operations today. In the 90s, revisions to the model included adding higher-resolution coastal bathymetry as meshed grids, while maintaining two-way flow. Paul spent approximately two years hand digitizing National Ocean Service (NOS) bathymetric navigation maps for coastal areas of Alaska and the West Coast in order to get the high-resolution data needed for the ATFM nested grids which has since been updated with GIS data using LIDAR and other high-resolution imagery.

Paul has had a prominent role in the rise of tsunami forecasting. Paul's creation of the ATFM was first used operationally in 1997 to predict wave heights for a tsunami event off the coast of Kamchatka. This was the first tsunami forecast issued from the TWCs, with wave heights being manually entered into the event website display. Since then, the TWCs have adopted other forecast models such as SIFT and RIFT into operations, to use along with the ATFM. Tsunami forecast products have grown beyond wave heights, and also include: area of inundation, currents, time of maximum wave, event duration, and other helpful information. Forecast products are automatically included in messages and on the NTWC event website, and can also be accessed from Tview – a website where tsunami products are viewed as GIS layers using ESRI maps. When asked about his vision for the Tsunami Warning System in 10 years' time, Paul said he envisioned what is currently planned for Tview coming to fruition - with all the available tsunami observations and forecast products as GIS layers, available on the web, quickly after an event, for the entire public.

*“Paul exemplifies the behavior
he wants to see in others.”*

- Bill Knight

Thinking back to memorable moments, Paul recalled a unique incident that occurred off the Oregon coastline in 1996. The ground shook, people heard a boom, and residents assumed a moderate sized earthquake had occurred. Many people were evacuating for fear of a tsunami. However, the seismic data at the NTWC was contradictory. There were multiple signals occurring on seismometers along the Oregon coast, but the timing and arrivals of the signals, did not match with the speed of a seismic P-wave. Instead, the timing of the signal arrivals matched the speed of air waves. Paul was able to confirm with emergency managers that no earthquake had occurred, but instead, a probable sonic boom. Later it was learned that a

military exercise had been occurring 100 miles offshore, involving Air National Guard fighter jets and bombers. Unique atmospheric conditions that day channeled the energy released, allowing the effects of the sonic boom to travel a far greater distance than normal.

*Big wave in ocean
Beep Beep Beep gonna call Paul
Tsunami Buster
-Haiku by Marie Eblé*

Another memorable moment was the 2011 Japan M9.1 earthquake and resulting tsunami. Paul was at his cabin north of Trapper Creek, AK - a remote location, only accessible by snowmobile, and at the edge of cell phone reception - when he got the message. A large earthquake had occurred, the “All Call” button had been activated, and all hands were needed at the NTWC. His son started up the vehicle, and Paul hopped on the back of the snowmobile for the 2.5 mile trip to his car, and then hit the highway. Footage taken of NTWC operations during the first few hours of the Tohoku tsunami event clearly documents the center's director working the event while still wearing his snow pants.

Paul will be retiring on June 23rd, 2017. He will continue living in Palmer, AK, and is looking forward to having more spare time to do the things he enjoys. He has been renovating a house this last year and is excited to finish it up so he and his wife can move into their new home. When not adding household improvements to his remote cabin, Paul enjoys spending his time demoing and renovating houses and plans to continue with this endeavor in his retirement.

When asked one final question, “Any advice for next director?”

“Stay focused on operations.” - Paul Whitmore

Lori Dengler Honored for Contributions to California Tsunami and Seismic Safety

Seismological Society of America News Release May 2017

For her exceptional leadership as a scientist, writer, educator, communicator and advocate of tsunami research and preparedness, the Seismological Society of America (SSA) honors Lori Dengler with the 2017 Frank Press Public Service Award.

Dengler, a Professor Emeritus at Humboldt State University, will receive the Press Award at Seismology of the Americas, a joint meeting of the SSA and the Latin American and Caribbean Seismological Commission (LACSC), to be held 23-26 April 2018 in San Juan, Puerto Rico.

"California's level of preparedness for earthquakes and tsunamis, particularly along the north coast that is part of Cascadia, is very much due to [Dengler's] efforts to bring the science to the public, the local, regional, tribal, state and federal officials who must make and support preparations, and the emergency managers who have to deal with the effects of earthquakes and tsunamis," said Peggy Hellweg, operations manager at the Berkeley Seismological Laboratory.

For more than 30 years, Dengler has been a tireless force in preparing coastal communities in California and around the world for tsunamis. She participated in post-event field teams studying tsunamis in 1998 in Papua New Guinea, 2004 in Indonesia, 2010 Chile and 2011 in Japan, among others, and as a result was a coordinating co-author on the UNESCO-IOC's International Post-Tsunami Survey Field Guide. For the U.S., Dengler served as a member of the group that developed the National Tsunami Hazard Mitigation Program and authored the program's initial Strategic Implementation Plan for Mitigation Projects as the Scientific Lead from California.

On the regional level, Dengler was a founding member of the Redwood Coast Tsunami Work Group in 1996 to bring together local, state, tribal, and federal agencies, nongovernmental organizations and businesses to reduce and learn more about seismic risks along California's northern coast. "Living on Shaky Ground: How to Survive Earthquakes and Tsunamis in Northern California," a preparedness guide developed by Dengler, has become a model for similar citizen guides throughout California.

In 2015, Dengler co-authored *The Extraordinary Voyage of Kamome: A Tsunami Boat Comes Home*, a bilingual Japanese-English children's book about a small fishing boat that was swept across the Pacific Ocean by the 2011 Japan tsunami and came ashore in Crescent City, California two years later. The book and a surrounding outreach project are the basis of a new school curriculum in California on earthquakes and tsunami preparedness.

Dengler received her bachelor's (1968), master's (1973), and Ph.D. (1979) degrees in geophysics from the University of California, Berkeley. She has served as the director of the Humboldt Earthquake Education Center since 1986, was recognized as Humboldt State University's Scholar of the Year in 2008 and was the 2009 recipient of the Alfred E. Alquist Medal for Outstanding Achievement in Earthquake Safety.

The Frank Press Public Service Award honors outstanding contributions to the advancement of public safety or public information relating to seismology. This award may be given to any individual, combination of individuals, or organization.

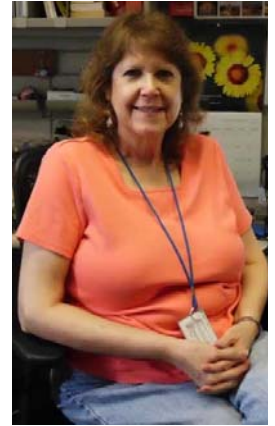


See original article: https://www.eurekaalert.org/pub_releases/2017-05/ssoa-ldh051117.php

After 40 Years of U.S. Government Service, Paula Dunbar Retires from NCEI

By Kelly Stroker, NOAA National Centers for Environmental Information (NCEI)

After nearly 40 years of U.S. Government service, Paula Dunbar retired from NOAA's National Centers for Environmental Information (NCEI, formerly NGDC) on June 2nd, 2017. For 25 of those years, Paula was the lead scientist developing and maintaining the Global Historical Tsunami Database (GHTD). Paula's particular interest was the use of historical tsunami event data and information for tsunami hazard and risk assessment and mitigation at the local, regional, and national levels. She has been part of the US delegation for ICG/CARIBE EWS and ICG/PTWS and serves as the IUGG Georisk Commission Secretary and Treasurer. Her pioneering use of database and web technologies, along with her great attention to detail, passion for the data, and commitment to ensuring all available information is included, has made the GHTD the most frequently cited source of historical tsunami information.



Historical tsunami data are critical for real-time evaluation by the Tsunami Warning Centers, for setting the thresholds for issuing warnings and for emergency managers and planners in setting design criteria. The GHTD was the first to become digital, and when Paula joined in 1991, she undertook the enormous task of digitizing and verifying data from all available tsunami catalogs. This task continues today as new events occur or new information is discovered, even for very old events.

In addition to the GHTD, Paula managed the NCEI Significant Earthquake, and Significant Volcanic Eruptions databases. She has developed web-based educational tools, interactive maps, and worked on GIS-based hazard assessment projects such as earthquake loss estimation and tsunami vulnerability analysis. Prior to joining NCEI in 1991, Paula worked for NOAA's Space Environment Services Center as a Solar Technician and for the USGS National Earthquake Information Center as a Physical Science Technician.

Paula has been an invaluable resource to the tsunami community and the heart of the NCEI Hazards Team. We will certainly miss her regular presence at NCEI and are hoping to keep her as a part-time employee through the University of Colorado. Many of you have met Paula at various meetings around the globe, so please join me in thanking Paula for the many years of service to this community!

Projecting Community Changes in Hazard Exposure to Support Long-Term Risk Reduction: A Case Study of Tsunami Hazards in the U.S. Pacific Northwest

By Benjamin M. Sleeter, Nathan J. Wood, Christopher E. Souldard, Tamara S. Wilson

Abstract: Tsunamis have the potential to cause considerable damage to communities along the U.S. Pacific Northwest coastline. As coastal communities expand over time, the potential societal impact of tsunami inundation changes. To understand how community exposure to tsunami hazards may change in coming decades, we projected future development (i.e. urban, residential, and rural), households, and residents over a 50-year period (2011–2061) along the Washington, Oregon, and northern California coasts. We created a spatially explicit, land use/land cover, state-and-transition simulation model to project future developed land use based on historical development trends. We then compared our development projection results to tsunami-hazard zones associated with a Cascadia subduction zone (CSZ) earthquake. Changes in tsunami-hazard exposure by 2061 were estimated for 50 incorporated cities, 7 tribal reservations, and 17 counties relative to current (2011) estimates. Across the region, 2061 population exposure in tsunami-hazard zones was projected to increase by 3880 households and 6940 residents. The top ten communities with highest population exposure to CSZ-related tsunamis in 2011 are projected to remain the areas with the highest population exposure by 2061. The largest net population increases in tsunami-hazard zones were projected in the unincorporated portions of several counties, including Skagit, Coos, and Humboldt. Land-change simulation modeling of projected future development serves as an exploratory tool aimed at helping local governments understand the hazard-exposure implications of community growth and to include this knowledge in risk-reduction planning.



Access full article: <http://dx.doi.org/10.1016/j.ijdr.2017.02.015>

PROJECT UPDATES

Humboldt County Tsunami Hazard Zone App

By Todd Becker, Humboldt County Department of Public Works and
Redwood Coast Tsunami Work Group (RCTWG)

A Tsunami Hazard Zone App (<http://arcg.is/2q9U50p>) was developed for the Redwood Coast Tsunami Work Group (RCTWG) to provide an additional tool for community tsunami hazard planning and preparedness on the northern California coast in Humboldt County.

The project involved creating an interactive web based GIS mapping application using the existing tsunami hazard zone data which are based on the worst case tsunami threat - a magnitude 9 earthquake on the Cascadia subduction zone. The Tsunami Hazard Zone App is providing an additional tool to present the tsunami hazard zone maps to the community and augments the existing maps and educational materials provided by the RCTWG. The Tsunami Hazard Zone App provides interactive functionality such as access to the GPS on a smartphone or other device to show current location relative to the tsunami hazard zones. The community is being encouraged to access the Tsunami Hazard Zone App at home, work, school, and places of recreation to identify tsunami hazard zones and evacuation areas and develop a plan prior to an earthquake or tsunami warning.

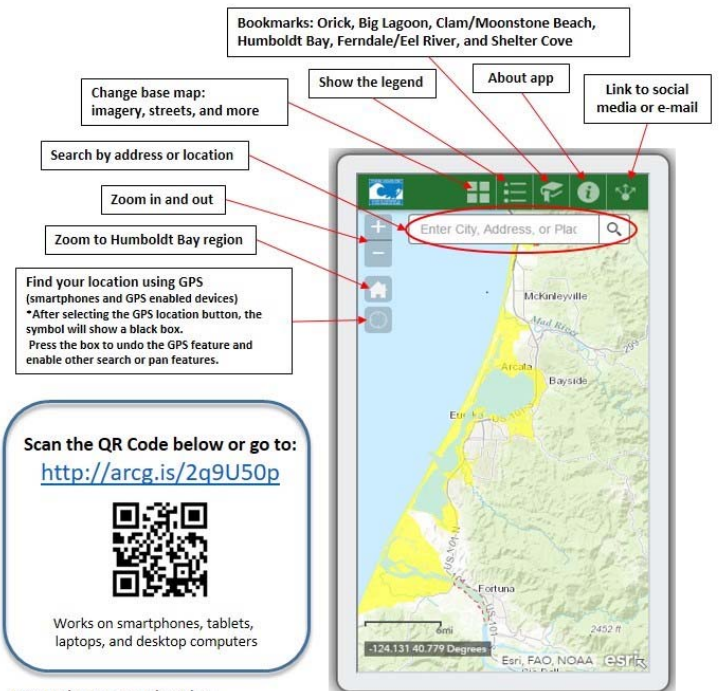
The application was developed using ESRI's ArcGIS® software. The tsunami hazard zone GIS data were hosted online to create web based maps, and tools within the ArcGIS® platform were used to configure the application and make it available at a publically accessible website. The Tsunami Hazard Zone App is responsive and designed to work on most smartphones, tablets, laptops and desktops. The Tsunami Hazard Zone App is accessed by following a link (<http://arcg.is/2q9U50p>) or scanning a QR code. The application is viewed similarly to a webpage, and internet service is required. There is nothing to download to view the application.

The application was released to the public in March 2017. Links and information about the Tsunami Hazard Zone App have been provided through e-mail, social media, and local news outlets. Thousands of visits to the application have recently been recorded. Future developments include adding Del Norte and Mendocino County tsunami hazard zone data to the Tsunami Hazard Zone App, and offline viewing capabilities through an app that can be downloaded onto a device.

The Humboldt County Tsunami Zone Map App

Know your zone Humboldt County

- ❖ Use this App to identify if the places you work, live, or play are within a Tsunami Evacuation Zone.
- ❖ Plan ahead. Know your zone and plan your route to high ground before the earthquake and tsunami happen.



PROJECT UPDATES

Twelfth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions Held in Costa Rica

By Christa von Hillebrandt-Andrade, NOAA Caribbean Tsunami Warning Program

The Twelfth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS-XI) of UNESCO was held in Puntarenas, Costa Rica, from May 10-12, 2017. The meeting was hosted by the Government of Costa Rica and was attended by some 60 participants from Caribbean countries and territories and observer organizations: Puerto Rico Seismic Network (PRSN), Seismic Research Center, UNAVCO, and the Center for Disaster Prevention for Central America (CEPREDENAC). The U.S. Delegation was led by Michael Angove, Tsunami Program Manager and also included delegates from NWS International Activities, Pacific Tsunami Warning Center, Caribbean Tsunami Warning Program, U.S. Geological Survey, the International Tsunami Information Center, National Aeronautics and Space Administration and the National Centers for Environmental Information.

The participants reviewed the accomplishments in 2016-2017 including the advances in the Tsunami Ready pilot program, improvements in tsunami observational data for warning services and the very successful conduct of the CARIBE WAVE 17 exercise with over 740,000 participants from 47 Member States and Territories in the Caribbean and Adjacent Regions.

The ICG recommended that in the upcoming intersessional period should focus on the reopening of Caribbean Tsunami Information Center (CTIC), evaluating the integration of GNSS data for improved earthquake and tsunami detection and assessment, the establishment of a Group of Experts to enhance the warning system by including other coastal hazards, continued piloting of CARIBE EWS Tsunami Ready Guidelines, evacuation mapping and the conduct of CARIBE WAVE 18 on March 15, 2018.

Highlights of the meeting included the Tsunami Ready recognition of the Ostional, a community along the Pacific Coast of Costa Rica and a Community Best Practices session held in memory of Julie Leonard, Advisor of USAID and supporter of CARIBE EWS and PTWS who passed away in 2016.



Participants of the Twelfth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions

PROJECT UPDATES

The Multi-Hazard Early Warning Conference and the 2017 Global Platform for Disaster Risk Reduction

By Carolina Hincapié, NOAA Caribbean Tsunami Warning Program

The NOAA/NWS Caribbean Tsunami Warning Program (CTWP) participated in the Multi-Hazard Early Warning Conference (MHEWC) held in conjunction with the 2017 Global Platform for Disaster Risk Reduction (UNISDR), in Cancún - México from May 22 - 26, 2017. The Global Platform, established in 2006, is the main forum at the global level where the implementation of international instruments on disaster risk reduction is reviewed with the goal of building resilient communities and nations. The MHEWC focused on the improvement of the availability and access to multi-hazard early warnings as well as risk information and assessments.

Three posters were presented to inform on tsunami warning and mitigation activities of CTWP and Member States of the UNESCO IOC ICG/CARIBE EWS (Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions).



The poster entitled Quantifying Improvements in Earthquake and Tsunami Monitoring Performance in the Caribbean Region marked the significant improvement that the earthquake monitoring and tsunami detection in the Caribbean region in the past 12 years. The increase in the number of real-time seismic and sea level stations available to the Regional Tsunami Service Provider (NOAA-Pacific Tsunami Warning Center) has led to more timely and accurate tsunami services.



Posters presented by CTWP in the MHEWC, Cancún – Mexico, 22-26 May, 2017.

international pilot recognition program, with elements for Preparedness, Mitigation and Response, is aligned with priorities for actions of the Sendai Framework for Disaster Risk Reduction 2015-2030.

The annual Regional tsunami exercise, CARIBE WAVE, which simulates different tsunami scenarios and provides an opportunity to the Member States of the UNESCO IOC ICG/CARIBE EWS to test their tsunami response protocols was described in the poster CARIBE WAVE Tsunami Exercise for the Caribbean and Adjacent Regions.

RESEARCH

New Zealand Palaeotsunami Database

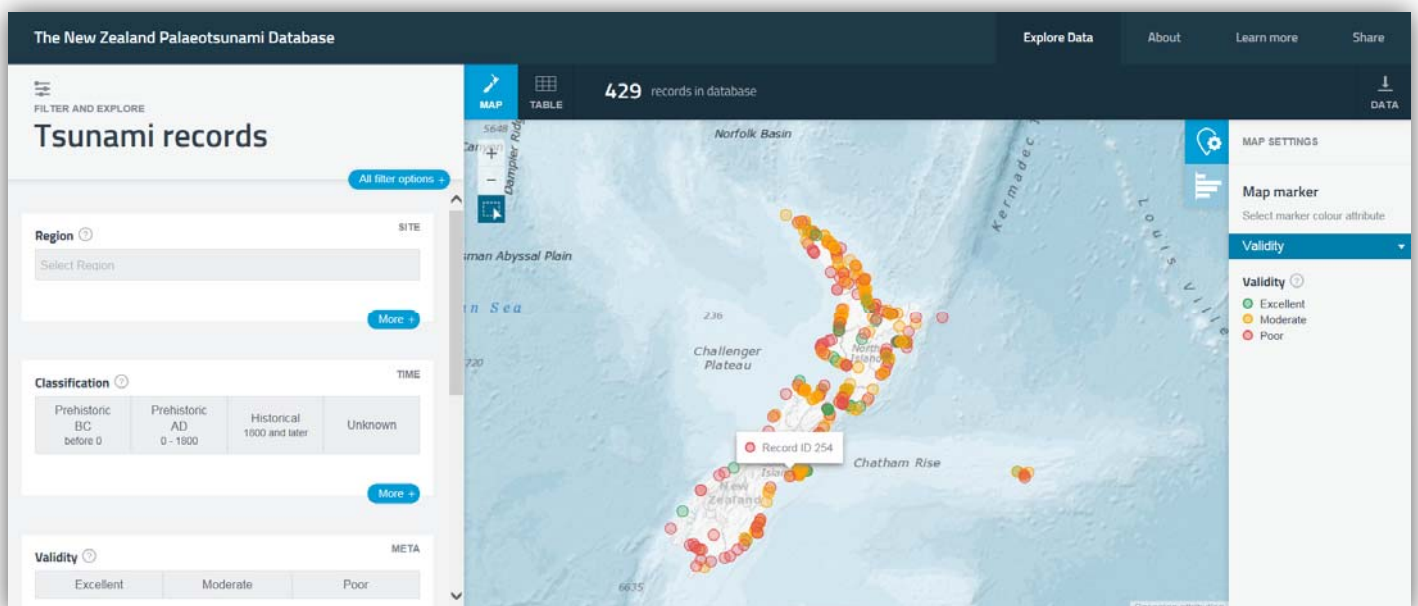
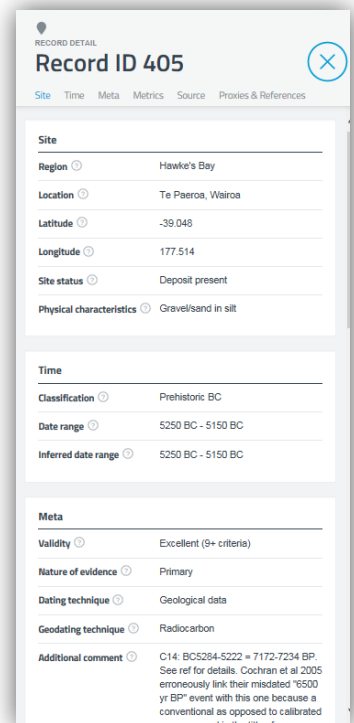
Based on the work of Professor James Goff, University of New South Wales Australia

Database provided by: National Institute of Water & Atmospheric Research Ltd (NIWA) and the Ministry for Civil Defence and Emergency Management (MCDEM)

Contributors include: UNSW Australia; Dumpark; eCoast; and Environment Canterbury

The purpose of this Database is to increase awareness of New Zealand's tsunami hazard and facilitate processing and analysis of palaeotsunami information. It consolidates a wide range of published and unpublished research contributions from a range of institutions and science providers, both domestic and overseas, on palaeotsunamis in Aotearoa-New Zealand. The Database is based on the work of former NIWA earth scientist, Professor James Goff of the University of New South Wales, Australia; and is provided by the National Institute of Water & Atmospheric Research Ltd (NIWA) and the Ministry for Civil Defence and Emergency Management (MCDEM). This information is freely available to you.

Each line of data in the Database summarises the evidence related to one site under a series of headings including physical evidence from geological and archaeological sources as well as cultural information from anthropological and cross-disciplinary studies. The Database currently contains 429 line items and most likely describes more than 50 palaeotsunami events. Data include: site information, nature of the evidence, chronology and dating techniques, maximum water heights, horizontal inundation distances, sources and supporting meta-data for specific locations. The Database is not intended to be complete however, rather as research progresses iterations will be made to remove erroneous data and add new data.



Visit database online: <https://ptdb.niwa.co.nz/>

RESEARCH & NTHMP EVENTS

CURRENT TSUNAMI RESEARCH

Kain, C.L., Wassmer, P., Goff, J., Chagué-Goff, C., Gomez, C., Hart, D.E., Fierro, D., Jacobsen, G.E. and Zawadzki, A. (2017) Determining flow patterns and emplacement dynamics from tsunami deposits with no visible sedimentary structure. *Earth Surface Processes and Landforms*, 42, 763-780. DOI: 10.1002/esp.4020.



King, D. N.; Goff, J. R.; Chagué-Goff, C.; McFadgend, B.; Jacobsen, G. E.; Gadd, P.; Horrocks, M., 2017, Reciting the layers: Evidence for past tsunamis at Mataora-Wairau Lagoon, Aotearoa-New Zealand: *Marine Geology*, May 2017, <https://doi.org/10.1016/j.margeo.2017.05.001>.

Lane, E.M., Borrero, J., Whittaker, C., Bind, J., Chagué-Goff, C., Goff, J., Goring, D., Hoyle, J., Mueller, C., Power, W.L., Reid, C., Williams, J. and Williams, S. (2017) Effects of inundation by the 14th November, 2016 Kaikoura tsunami on Banks Peninsula, Canterbury, New Zealand. *Pure and Applied Geophysics*, 174, 1855-1874, DOI: 10.1007/s00024-017-1534-x.

Mori, Nobuhito; Muhammad, Ario; Goda, Katsuichiro; Yasuda, Tomohiro; Ruiz-Angulo, Angel, 2017, Probabilistic Tsunami Hazard Analysis of the Pacific Coast of Mexico: Case Study Based on the 1995 Colima Earthquake Tsunami: *Frontiers in Built Environment*, June 2017, <https://doi.org/10.3389/fbuil.2017.00034>.



Raskin, Jay; Wang, Yumei, 2017, Fifty-year resilience strategies for coastal communities at risk for tsunamis: *Natural Hazards Review*, v. 18, no. 1, DOI: [http://dx.doi.org/10.1061/\(ASCE\)NH.1527-6996.0000220](http://dx.doi.org/10.1061/(ASCE)NH.1527-6996.0000220).

Savastano, Giorgio; Komjathy, Attila; Verkhoglyadova, Olga; Mazzoni, Augusto; Crespi, Mattia; Wei, Yong, 2017, Real-Time Detection of Tsunami Ionospheric Disturbances with a Stand-Alone GNSS Receiver: A Preliminary Feasibility Demonstration: *Scientific Reports* 7, no. 46607, doi:10.1038/srep46607.



Song, Y. T.; Mohtat, Ali; Yim, S. C., 2017, New insights on tsunami genesis and energy source: *Journal of Geophysical Research Oceans*, May 2017, DOI: 10.1002/2016JC012556.

UPCOMING NTHMP & RELATED EVENTS

◆ August 1-3, 2017—NTHMP Summer MES & MMS Subcommittee Meetings by invitation only (Salt Lake City, Utah) <http://nws.weather.gov/nthmp/2017mesmms/index.html>

◆ October 22-25, 2017—GSA Annual Meeting (Seattle, Washington) <http://community.geosociety.org/gsa2017/home>

◆ December 11-15, 2017—AGU Fall Meeting (New Orleans, Louisiana) <https://fallmeeting.agu.org/2017/>

◆ May 7-9, 2018—8th International Symposium on Submarine Mass Movements and Their Consequences (Victoria, British Columbia) <http://igcp640.oceannetworks.ca/>

