



PRICIP

NOAA Integrated Data and Environmental Applications (IDEA) Center • Pacific Region Integrated Climatology Information Products
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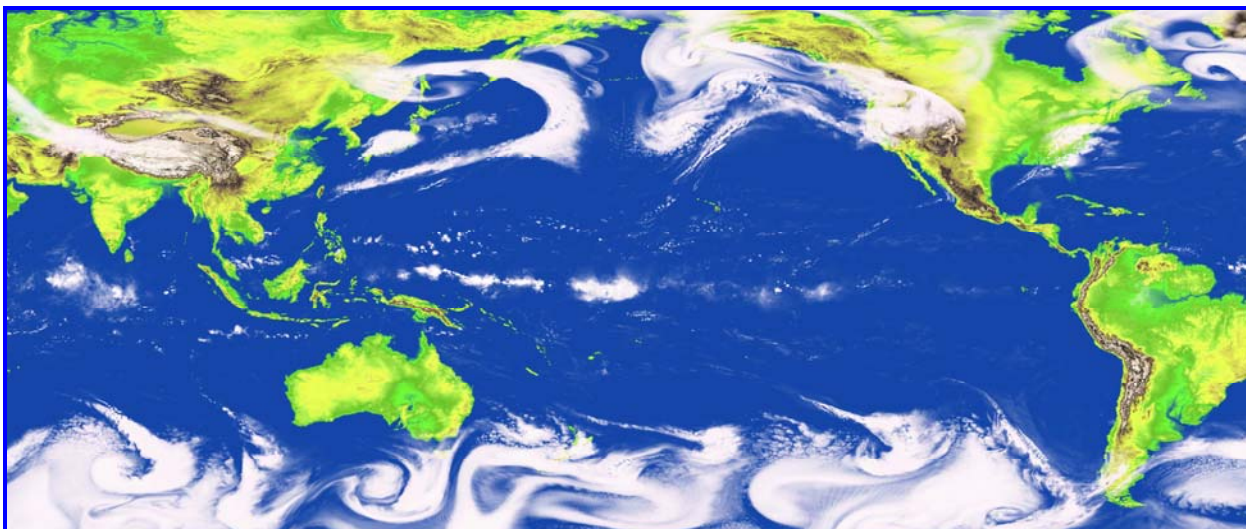


Image courtesy of NOAA's Geophysical Fluid Dynamics Laboratory

Pacific Storm Facts:

- ◆ In 1992 the island of Kauai in Hawaii was hit by Hurricane Iniki. The estimate of the physical damage was \$2.5 billion.
- ◆ SuperTyphoon Pongsona struck the island of Guam on December 8, 2002. With over \$700 million in damages, the typhoon was reportedly the most costly disaster in the entire U.S. during the year 2002.
- ◆ In October 2004, a powerful "explosively deepening" storm moved up the entire Alaska west coast, causing \$30 million in damages in an area with only 50,000 people. A 10.5-foot water level surge went right over the sea wall at Nome and catastrophic erosion at many villages sent buildings into the sea, damaged airports, and contaminated drinking water. A "once in a hundred year" event, Nome was again flooded by a 10-foot surge in September 2005.

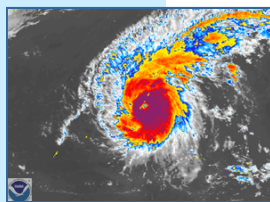


Photo courtesy of NOAA

Coastal storms, and the strong winds, heavy rains, and high seas that accompany them, pose a threat to the lives and livelihoods of the peoples of the Pacific.

To reduce their vulnerability to the economic, social, and environmental risks associated with these

phenomena (and correspondingly enhance their resiliency), decision-makers in coastal communities need timely access to accurate information that affords them an opportunity to plan and respond accordingly.

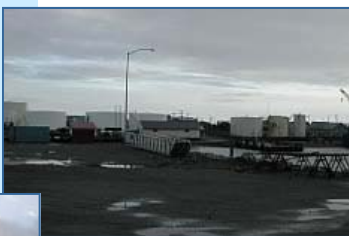
This includes information about the potential for coastal inundation and erosion at time scales ranging from hours to years, as well as the long-term climatological context of this information.

Through the Pacific Region Integrated Climatology Information Products (PRICIP) project, the NOAA NCDC Integrated Data and Environmental Applications (IDEA) Center is working to address this need. PRICIP is improving our understanding of patterns and trends of storm frequency and intensity - "storminess"- within the Pacific region. PRICIP is exploring how the climate-related processes that govern extreme storm events are expressed within and between three thematic areas: *heavy rains, strong winds, and high seas*. A key outcome of this effort is the development of a suite of integrated data and information products that can be used by emergency managers, mitigation planners, government agencies and decision-makers in key sectors including water and natural resource management, agriculture and fisheries, transportation and communication, and recreation and tourism.

This effort is a regional path finding activity towards the development of a national comprehensive coastal climatology program.



Photo courtesy of the American Samoa Coastal Management Program



Nome boat harbor during a normal day, courtesy of John Lingaas, WFO Fairbanks NOAA's National Weather Service



The same view during flooding in 2004, courtesy of Jerry Steiger, WSO Nome NOAA's National Weather Service



Photo courtesy of NOAA





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More Pacific Storm Facts:

- ◆ March 2006 brought heavy rains to the main Hawaiian Islands, which led to flooding and landslides: a deadly dam break in northern Kauai, and a major sewage spill in Honolulu's Waikiki district. Record rainfall totals were reached in many areas of the state including Mount Waialeale on Kauai (one of the wettest places on earth), recorded its second wettest March on record with 93.71 inches of rain.

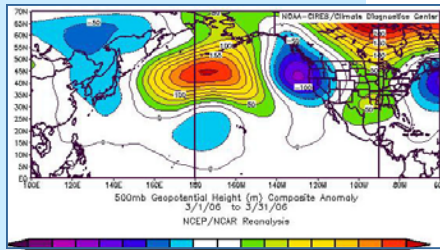


Image of the March 2006 low pressure system in the Pacific courtesy of NOAA's National Weather Service

- ◆ In American Samoa, the heaviest rainfall in nearly 20 years occurred during May 18–20, 2003. The territory had 10–15 inches of rainfall, most of it in 2–3 hours. Four people were killed by mudslides, one person was seriously injured, and three people were rescued from two homes buried by a mudslide.



Photo courtesy of the American Samoa Coastal Management Program

- ◆ In Hawaii, more lives are lost annually to high surf than any other weather-related event. On one day in June 2003, the biggest south swell of the season closed the entrance to the Ala Wai Yacht Harbor, tossed boats and enthralled wave riders as lifeguards on Oahu performed 350 rescues at Waikiki and Ala Moana beaches and assisted another 600 ocean goers.



Photo courtesy of NOAA

Targeted Information and Derived Data Products

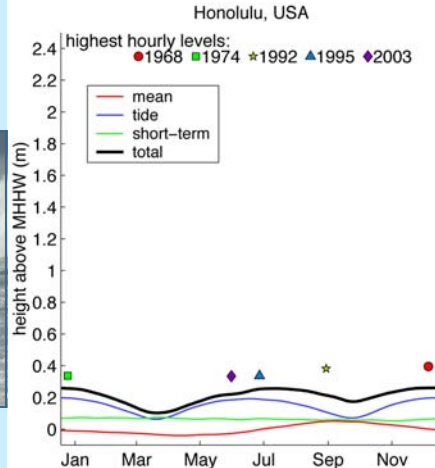
The PRICIP portal is the mechanism whereby products developed through the PRICIP project, as well as those that originate from other sources, can be viewed and retrieved. As part of the initial build out, the PRICIP portal is serving a set of historical storm event anatomies as a targeted information product proof-of-concept via a portal test bed. These event anatomies include a summary of sector-specific socioeconomic impacts associated with a particular extreme event as well as its historic context

climatologically. The intent is to convey the impacts associated with extreme events and the causes of them in way that enable users to easily understand them. The event anatomies are also intended to familiarize users with in-situ and remotely sensed products typically employed to track and forecast weather and climate.

A suite of strong winds, heavy rains, and high seas derived data and product sets is also being severed as part of the initial PRICIP build out. Theme-specific data integration and product development teams have been formed to carry out this work. These teams are comprised of recognized agency and university-based experts. They include representatives from NOAA's National Climatic Data Center (NCDC), Center for Operational Products and Services (CO-OPS), Coastal Services Center (CSC), and National Weather Service (NWS), as well as the University of Hawaii, University of Alaska, University of Guam, and Oregon State University. Other project partners include NASA and USGS.

Each theme team is delineating trends such as annual rates of change They are also delineating event return recurrence intervals via Generalized Extreme Value (GEV) analyses and will correlate event characteristics with regional climatological indices (e.g., ENSO and PDO). Sources of information include NOAA's Integrated Surface Hourly (ISH) mean sea level pressure and wind speed data; the Global Historical Climate Network (GHCN) precipitation dataset; the National Water Level Observing Network (NWLON) tide gauge records; the National Data Buoy Center (NDBC) wave buoy records; the U.S. Army Corps of Engineers' Coastal Data Information (CDIP) buoy data, and other data.

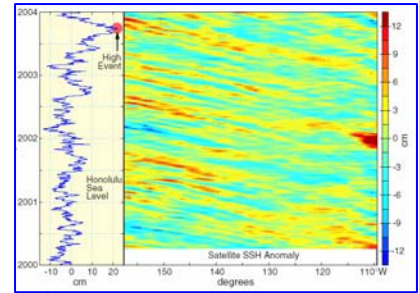
To view the PRICIP portal proof-of-concept go to <http://www.pricip.org/>



Extreme event climatology at Honolulu formed by deconstructing the tide gauge record into seasonal, tidal, and high frequency water level components. The three components are stacked yielding a metric for the average extreme water level (approximately the 95% exceedance) for each day of the year, with an indication of the relative importance of tides, storms (residual), and seasonal water level variations due to heating and winds. The five highest hourly values measured are denoted for comparison with the climatology.

Source
This product was developed for PRICIP by the UHSLC (<http://uhslc.soest.hawaii.edu/>)

References
Merrifield, M.A., Firing, Y.L., and Marra, J.J. Annual Climatologies of Extreme Water Levels. In Aha Hulikoa: Extreme Events. Proceedings of the Hawaiian Winter Workshop. University of Hawaii at Manoa. January 23-26, 2007.



This is a graphic demonstrating how tide station data and satellite data can be integrated to show the relationship of the time history of monthly mean sea level anomalies over a portion of the Pacific basin.

Figure courtesy of the University of Hawaii Sea Level Center