PRiMO
Pacific Risk Management 'Ohana

Kalāhuina Kuene 'Okapakipika

Data Analysis and Decision Support Tools Inventory

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PRiMO Data Analysis and Decision Support Tools Inventory

The Data Analysis and Decision Support Tools Hui has committed to developing an inventory of existing data analysis and decision support tools. This inventory is a first step towards enhancing the development and delivery of information products and services in the Pacific. This initial effort is focused on identifying those tools currently in use or that could be of use in the Pacific.

The document is intended to be a continual work in progress. The current format is a combination of suggestions heard in discussion at the 2004 FHMPPI and previous efforts to inventory decision support tools. If contributing to this inventory, please be as thorough as resources permit and consider this initial collection is meant to be broad in scope. The following page contains a template entry with a brief description of the information to be included in each field.

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Entry Template

Name (Please include the full name, acronym, and any version number if appropriate.)	
Source	Please include the full name of the governmental agency, academic institution, non-governmental organization, or private consultant responsible for development, maintenance, and support.
Hazards Focus	Please include the specific hazard(s) addressed
Description	Please provide a brief description of the tool.
Implementation	Please indicate if this tool is intended to support short-term decision making by emergency/incident responders (Short Term) or long-term decision-making by mitigation planners/resource managers (Long Term).
Media Format	Please indicate the format of the tool. (website, cd-rom, stand-alone software, desktop GIS application, web-based GIS application, video, bound-paper product, etc.)
Training Resources	Please include information on any available training resources supporting the use of this tool. (websites, publications, instructor led courses, etc.)
Primary User	Please indicate the primary user of this tool. (emergency response personell, land use planners, research community, resource managers, etc.)
Experience in Pacific	Please briefly describe the current level of use in the Pacific.
Data Requirements	Please briefly describe the data requirements to apply this tool in the Pacific.
Known Limitations	Please briefly describe any known limitations to application of this tool in the Pacific.
For More Information	Please list any resources that may provide more detailed information about this tool. (websites, publications, individuals, etc.)

FEMA Hazards United States – Multi-Hazards (HAZUS-MH)

Source	Federal Emergency Management Agency (FEMA)
Hazards Focus	Earthquakes, hurricane winds, flooding
Description	HAZUS-MH is a risk assessment and loss estimation GIS software application designed for states, communities, and businesses to prepare for, mitigate the effects of, respond to, and recover from a hazard event. HAZUS-MH estimates physical damage, economic losses, and social impacts at multiple scales using national datasets and GIS technology.
Implementation	HAZUS-MH can be implemented as a short-term tool immediately following a hazard event to estimate potential losses or for long-term mitigation planning.
Media Format	HAZUS-MH is a GIS software application that requires the user to have Environmental Systems Research Institute's (ESRI) ArcView 8.3 software running on an IBM compatible PC with Windows 2000 SP2 or Windows XP SP1. The ESRI Spatial Analyst software extension is required to estimate flood losses. HAZUS-MH is delivered by request on 3 CDs and one DVD.
Training Resources	Regularly scheduled HAZUS training classes are held at FEMA's National Emergency Training Institute (EMI) in Emmitsburg, Maryland, 75 miles north of Washington, DC. There are regional HAZUS User Groups including one in Hawaii and HAZUS Conferences. There are numerous other resources including publications, manuals, and case studies.
Primary User	Primary users are emergency management personell.
Experience in Pacific	HAZUS-MH has only been applied for earthquake simulations in Hawaii. HAZUS-MH cannot currently be applied in other locations in the Pacific due to data limitations.
Data Requirements	HAZUS-MH requires one of three levels of data depending on the desired accuracy of the modeled estimate. Level 1 data is provided and is used to produce a basic estimate of losses. More accurate estimates of losses require Level 2 data that is more detailed information such as local geological data, an inventory of buildings in the community, and data concerning utilities and transportation systems. A state-of-the-art estimate of loss requires Level 3 detailed engineering and geotechnical input data, which allow the user to customize the methodology to the specific conditions of the community.
Known Limitations	HAZUS-MH cannot currently be applied in Guam, American Samoa, or CNMI due to the lack of Level 1 data. For additional details and limitations please refer to the Hawaii HAZUS-MH Users Group White Paper Titled "HAZUS-MH Applications in the Pacific Region".
For More Information	Extensive information is available at www.fema.gov/hazus, www.hazus.org, and though the Hawaii HAZUS-MH Users Group.

FEMA HazardMaps.Gov	
Source	Federal Emergency Management Agency (FEMA)
Hazards Focus	
Description	
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.hazardmaps.gov/atlas.php

HURREVAC 2000 - Hurricane Evacuation Program (Version 3.0.12)

Source	Sea Island Software, Inc., Federal Emergency Management Agency (FEMA), U.S. Army Corps of Engineers (USACE), National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center and National Weather Service.
Hazards Focus	Tropical storms (Hurricanes and typhoons), wind, and inland (stream) flooding.
Description	HURREVAC is a restricted-use computer program used by official government emergency managers to track hurricanes and assist in evacuation related decision-making. The acronym HURREVAC was derived from HURRicane EVACuation and the software couples hurricane evacuation study data with current weather forecast data from the National Weather Service (NWS). HURREVAC was recently updated to include river forecast points, allowing emergency managers to access detailed river forecast information, including observed and forecast river stage, historical crests, NWS flood categories, and the 1% annual chance flood stage.
Primary User	HURREVAC is restricted for use by the official government emergency management community. It has short-term functionality for emergency/incident responders and can be used for long-term decision-making by mitigation planners/resource managers.
Media Format	Stand-alone software with desktop GIS.
Training Resources	Registered users can download a HURREVAC training package from http://www.hurrevac.com/training. There is also a user's manual and online help feature available in HURREVAC.
Secondary User	None at this time
Experience in Pacific	Unknown
Data Requirements	Evacuation study data for Honolulu County, Hawaii, is included in HURREVAC. No other evacuation study data in the Pacific Islands is currently available in HURREVAC. Emergency managers in the Pacific Islands can use the storm tracking features in HURREVAC to monitor approaching storms.
Known Limitations	There are no inland flood forecast points in the pacific islands. Limited evacuation study data exists for the Pacific Islands.
For More Information	Extensive information is available from www.hurrevac.com

Martin and Chock, Inc. - Average Annual Loss (AAL) Estimation Tool	
Source	Martin and Chock, Inc.
Hazards Focus	
Description	
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	

NOAA Trajectory Analysis Planner (TAP)

Source	NOAA Office of Response & Restoration, Hazardous Materials Response Division
Hazards Focus	Oil spills
Description	You use TAP to see the probability that any oil spill will reach a specific segment of shoreline. TAP analyzes statistics from potential spill trajectories generated by a NOAA OR&R oil spill trajectory model. This model predicts how an oil spill will spread and move within a local area. It takes into account: • the bathymetry and shoreline configuration of a particular body of water, including its channels, bays, and significant rivers; • currents and winds; and • shoreline characteristics that determine beaching and refloating of oil. Then for each season, the model generates 500 individual oil spill trajectories from each of about 300 potential spill locations. The model then compiles statistics for where, when, and how much oil impacts receptor sites into data files for TAP. TAP displays a map of a specific local area, including a major water body and the adjacent land. The map displays shoreline segments that represent the locations of shoreline resources such as seabird colonies or marine mammal hauling grounds, sites of particular socioeconomic value such as tourist beaches or large marinas, or areas where remediation measures would be difficult or expensive. You can use TAP to evaluate the probable threat to any of these sites from an oil spill that originates at any point within the mapped water body.
Implementation	Medium-term: Planning by emergency responders.
Media Format	A copy of TAP software for a specific location can be requested from ORR.TAP@noaa.gov.
Training Resources	N/A
Primary User	Emergency planners, developers of contingency plans.
Experience in Pacific	Currently exists only for Kaneohe Bay, HI.
Data Requirements	Wind patterns and tidal and non-tidal circulation.
Known Limitations	Only site with data available is Kaneohe Bay, HI.
For More Information	Web: http://response.restoration.noaa.gov/software/tap/tap.html or Email: ORR.TAP@noaa.gov

NOAA General NOAA Oil Modeling Environment (GNOME)

Source	NOAA Office of Response & Restoration, Hazardous Materials Response Division
Hazards Focus	Oil spills
Description	GNOME is a free computer program you can use to • predict how wind, currents, and other processes might move and spread oil spilled on the water. • learn how predicted oil trajectories are affected by inexactness ("uncertainty") in current and wind observations and forecasts. • see how spilled oil is predicted to change chemically and physically ("weather") during the time that it remains on the water surface.
Implementation	Long Term
Media Format	Free downloadable software; Windows and Macintosh versions available
Training Resources	Users' manual and tour; example library.
Primary User	Oil spill response planners
Experience in Pacific	Please briefly describe the current level of use in the Pacific.
Data Requirements	Location file is necessary; these are created by NOAA on request.
Known Limitations	Location files currently exist only for Kaneohe Bay, HI, and Apra Harbor, Guam. Files are being developed for southern Guam.
For More Information	http://response.restoration.noaa.gov/software/gnome/gnome.html

NOAA Computer-Aided Management of Emergency Operations (CAMEO)

Source	EPA's Chemical Emergency Preparedness and Prevention Office (CEPPO) and the National Oceanic and Atmospheric Administration Office of Response and Restoration (NOAA/OR&R)
Hazards Focus	Chemical releases
Description	CAMEO ® is a suite of three software applications (CAMEO, ALOHA, and MARPLOT) used widely to plan for and respond to chemical emergencies. Front-line chemical emergency planners and responders can use CAMEO to access, store, and evaluate information critical for developing emergency plans. Based on the chemical, CAMEO provides recommendations on fire fighting techniques, physical properties, health hazards, first aid guidance, and spill response. In addition, CAMEO supports regulatory compliance by helping users meet the chemical inventory reporting requirements of the Emergency Planning and Community Right-to-Know Act (EPCRA, also known as SARA Title III). CAMEO also can be used with a separate software application called LandView ® to display EPA environmental databases and demographic/economic information to support analysis of environmental justice issues. The CAMEO system integrates a chemical database and a method to manage the data, an air dispersion model, and a mapping capability. All modules work interactively to share and display critical information in a timely fashion.
Implementation	Short-term and medium-term
Media Format	Downloadable from http://www.epa.gov/ceppo/cameo/request.htm
Training Resources	Courses are offered by EPA; schedule at http://www.epa.gov/ceppo/cameo/cam-evnt.htm. Tutorials and exercises are available online at http://www.epa.gov/ceppo/cameo/build.htm. Support available at http://www.epa.gov/ceppo/cameo/support.htm.
Primary User	Front-line chemical emergency planners and responders: Firefighters, State Emergency Response Commissions (SERCs) and Tribal Emergency Response Commissions (TERCs), Local Emergency Planning Committees (LEPCs), Industry, Schools, Environmental Organizations, Police Departments.
Experience in Pacific	Used in Hawaii
Data Requirements	CAMEO requires input of basic information on facilities that store chemicals, on the inventory of chemicals at the facility (Tier II), and on emergency planning resources. Additionally, there are templates where users can store EPCRA information. MARPLOT maps can be downloaded from http://www.epa.gov/ceppo/cameo/marmaps/.
Known Limitations	ALOHA's limitations include reduced prediction capability at low wind speeds, with variable wind direction, or under highly unstable atmospheric conditions. ALOHA cannot incorporate chemical solutions, particulates, chemical reactions, or the results of fires into its modeling processes. ALOHA can't model nerve agent scenarios that involve indoor releases, releases requiring an explosive propellant, mixtures of chemicals, or nerve agents that exhibit low volatility at ambient temperatures.
For More Information	http://www.epa.gov/ceppo/cameo/; http://response.restoration.noaa.gov/cameo/cameo.html

NOAA NOS Mapfinder

Source	NOAA National Ocean Service
Hazards Focus	
Description	The NOS MapFinder service provides "one stop shopping" for images and data from a number of National Ocean Service (NOS) offices. The cornerstone of NOS MapFinder is a robust set of products available directly from the Web. These products are offered by theme (e.g., coastal aerial photography, low resolution nautical charts, coastal survey maps, environmental sensitivity index atlases, hydrographic survey outlines, historical maps, water level station data, geodetic control points, and estuarine bathymetry data). Products are accessed through a spatial inventory that locates and describes all data that NOS possesses for each theme. This allows for greater flexibility to identify specific products at regional, state, and local scales. Finally, accompanying each theme are explanatory information and metadata intended to help users better understand specific products, their sources, methods, quality, and usefulness.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://mapfinder.nos.noaa.gov/

NOAA NOS OCS Chartmaker

Source	NOAA NOS Office of Coast Survey
Hazards Focus	
Description	The Office of Coast Survey's Historical Map & Chart Collection contains over 20,000 maps and charts from the late 1700s to present day. The Collection includes some of the nation's earliest nautical charts, hydrographic surveys, topographic surveys, geodetic surveys, city plans and Civil War battle maps. The Collection is a rich primary historical archive and a testament to the artistry of copper plate engraving technology of the nineteenth and twentieth centuries. The Historical Map & Chart Project scans each map or chart and offers the images free to the public via the Coast Survey web site. The Project is managed by the Cartographic & Geospatial Technology Program of the Coast Survey Development Laboratory.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://chartmaker.ncd.noaa.gov/csdl/ctp/abstract.htm http://chartmaker.ncd.noaa.gov/

NOAA NGS Shoreline Data Explorer

Source	NOAA NOS National Geodetic Survey
Hazards Focus	
Description	This new system will allow traditional customers along the general public, access to the most contemporary digital vector data that NGS provides.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.ngs.noaa.gov/RSD/shoredata/NGS_Shoreline_Products.htm

NOAA NADCON

Source	NOAA NOS NGS
Hazards Focus	
Description	The readjustment of the North American Datum of 1927 (NAD 27), Old Hawaiian Datum and Puerto Rico Datum to the North American Datum of 1983 (NAD 83 (1986)) in July 1986 was both a change in reference ellipsoid and a "clean up" of nearly 200 years of surveying data held by NGS. Based on this readjustment and redefinition, positions of points can change between 10 - 100 meters, in the conterminous United States, more than 200 meters in Alaska, Puerto Rico and the Virgin Island and in excess of 400 meters in Hawaii. Consequently, the shift between the various datums are not uniform across the United States and there is no single value that can be applied to latitudes or to longitudes based on old datums to convert them to NAD 83. NADCON was developed in order to facilitate conversion between the datums,. The grids used by the program are based on more than 150,000 horizontal control points whose coordinates reside in NGS' data base, and provide transformed positions based on the shifts of the control nearest to the input position. Advances in the accuracies now obtainable in geodetic surveys, specifically through use of differential GPS, has allowed for the creation of state High Precision Geodetic Networks (HPGNs), also referred to as High Accuracy Reference Networks (HARNs) throughout the country. NAD 83 coordinates based on the HPGN/HARN surveys changed approximately 0.2 to 1.0 meter relative to the original NAD 83 (1986) adjustment. As these high accuracy networks have been completed, the horizontal geodetic network of each state has been re-adjusted to be consistent with its network of A- and B-order control, thus creating a need for grids that allow for the transformation from the NAD 83(86) adjustment to the new adjusted values. These grids carry the designation 'HPGN' to distinguish them from the grids created from the original NAD 83(86) adjustment. The accuracy of transformations between NAD 27 and NAD 83 (1986) are typically 12-18 cm and 5-6 cm between NAD 83 (1986) and HPGN.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.ngs.noaa.gov/TOOLS/Nadcon/Nadcon.html

NOAA VDatum Transformation Tool

Source	NOAA NOS NGS
Hazards Focus	
Description	**VDatum** is a tool for the transformation of elevation data from one vertical datum into another. Such transformations are necessary when data from diverse sources are to be combined or compared. Informally, a datum can be considered as a "coordinate system" of geo-spatial data. Artificial steps or discontinuties can appear in maps and charts if they are built from data based on inconsistent datums. This problem can be particularly acute in coastal areas. For example, on a gently sloping beach, an offset in elevation will change the depiction of the shoreline- it can shift the shoreline and change its slope on the map.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://spatialnews.geocomm.com/features/vdatum/index.html http://chartmaker.ncd.noaa.gov/bathytopo/vdatum.htm

NOAA Climate Visualization (CLIMVIS)

Source	NOAA NCDC
Hazards Focus	
Description	The Climate Visualization system is an interactive graphing tool designed to allow visual browsing of the data available on-line at the NCDC.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://lwf.ncdc.noaa.gov/oa/climate/onlineprod/drought/xmgr.html

NOAA Shoreline Mapping Website

Source	NOAA NOS CSC
Hazards Focus	
Description	The goal of the Web site is to provide the ocean and coastal resource management community with data and information related to shoreline mapping. Within this Web site, you will find links to digital data, references pertaining to the legal and technical aspects of shoreline, and organizations that are working to support the collection of shoreline data for the coastal component of the National Spatial Data Infrastructure.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.csc.noaa.gov/shoreline/index.html

NOAA Coastal Risk Atlas

Source	National Coastal Data Development Center (NCDDC) undertaken jointly with the NOAA Coastal Services Center (CSC).
Hazards Focus	
Description	The Coastal Risk Atlas (CRA) is a project of the National Coastal Data Development Center (NCDDC) undertaken jointly with the NOAA Coastal Services Center (CSC). The purpose of the project is to deliver an on-line risk/vulnerability atlas for the coastal U.S. using NCDDC information technologies. The CRA will provide the data and proven methodology to enable communities to assess vulnerabilities unique to the coastal zone. The project begins with development and implementation for two high priority areas. Based on success and lessons learned, it will expand to a larger coastal region, and eventually Nationwide. This phased approach enables identification and resolution of technical issues, better identification of needed data, and determining data inadequacies that could drive future data collection and coastal research initiatives.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.ncddc.noaa.gov/cra

NOAA Hurricane Evacuation Zone Maps

Source	NOAA Coastal Services Center, FEMA
Hazards Focus	Hurricanes, Storm Surge
Description	The Hurricane Evacuation Zone Maps Internet mapping site features the capability to search for a specific location and view its hurricane evacuation zone, links to stage emergency management offices and other Web resources, and descriptions of how hurricane evacuation and storm surge data are collected and utilized.
Primary User	This tool can be used by both short- and long-term decision makers and the general public
Media Format	Web site and ArcIMS (web-based mapping)
Training Resources	N/A
Experience in Pacific	This tool currently contains no Pacific related data. However, a modified version of the tool could be applied in the Pacific with different hazards data.
Data Requirements	N/A
Known Limitations	*See Experience in Pacific above.*
For More Information	www.csc.noaa.gov/hez_tool/

NOAA Historical Hurricane Tracks

Source	NOAA, NOS, CSC
Hazards Focus	Tropical cyclones
Description	The Historical Hurricane Tracks tool is an interactive mapping application that allows for search and display of Atlantic Basin and East-Central Pacific Basin tropical cyclone data
Primary User	General public
Media Format	Web site and ArcIMS (web-based mapping)
Training Resources	n/a
Secondary User	Scientists and researchers, media, GIS analysts, private businesses
Experience in Pacific	Recently expanded to include data for the East-Central Pacific Basin, extending back to 1949.
Data Requirements	n/a
Known Limitations	Data for the Western North Pacific Basin are not currently included in the application.
For More Information	*www.csc.noaa.gov/hurricane_tracks*

NOAA Coastal Storms Initiative (CSI) Pacific Northwest - Coastal Inundation Tool	
Source	NOAA, NOS, CSC; Oregon Department of Geology and Mineral Industries (DOGAMI)
Hazards Focus	Coastal inundation and erosion
Description	The Oregon Coastal Inundation tool is an online mapping application (ArcIMS) that allows for display of near real-time total water levels along a 9-mile stretch of coastline located in the Netarts littoral cell in Oregon.
Primary User	State and local planning and permitting agencies, transportation managers, emergency response agencies, researchers
Media Format	Web site and ArcIMS (web-based mapping)
Training Resources	n/a
Secondary User	Public
Experience in Pacific	n/a – tool is not yet available for public consumption
Data Requirements	n/a
Known Limitations	The tool is currently limited to a very small segment of coastline in Oregon. Pending availability of necessary data, the tool will be expanded to other applicable areas of the Oregon coast.
For More Information	Ethan Gibney, NOAA CSC or Jonathan Allan, DOGAMI

NOAA Community Vulnerability Assessment Tool New Hanover County, North Carolina (CVAT)

Source	NOAA Coastal Services Center, New Hanover County, NC
Hazards Focus	Multi-hazard: Hurricanes, Flooding, Storm Surge, Tornadoes, Earthquakes, Wind, and Coastal Erosion
Description	This tool provides users with a guide on how to apply the CVAT methodology used in conducting a risk and vulnerability assessment. The product was piloted in New Hanover County, North Carolina.
Primary User	Long-term decision-making by mitigation planners/resource managers
Media Format	Website, CD-ROM, Desktop GIS application (ArcVIew project files)
Training Resources	There is a training component to this product. The training is usually conducted by request. For more information on the CVAT training, visit */www.csc.noaa.gov/training/cvat-tool.html*
Secondary User	Elected officials, general public, planners
Experience in Pacific	A portion of this product has been used in Maui County, Hawaii and also in the T-HAT (?)
Data Requirements	This tool could be applied in the Pacific because it is a general methodology. The Pacific would need to gather hazards data (preferably in a GIS format), they would also need to have base-level data, such as roads, towns, parcels, etc.
Known Limitations	*See Data Requirements above.*
For More Information	*www.csc.noaa.gov/products/nchaz/startup.htm* *www.csc.noaa.gov/training/cvat-tool.html*

NOAA Risk and Vulnerability Assessment Tool Brevard and Volusia Counties, Florida (RVAT)

Source	NOAA Coastal Services Center, Brevard and Volusia Counties, Florida Emergency Preparedness
Hazards Focus	Tropical Cyclones, flooding, coastal erosion, wind,
Description	Through the Coastal Storms Initiative, staff from the National Oceanic and Atmospheric Administration worked with officials in Brevard and Volusia Counties, Florida, to demonstrate effective tools and methods for making these assessments. These tools and methods are easily adaptable to other communities and areas. Tools include an interactive mapping section, a tutorial on how to conduct a risk and vulnerability assessment, 3D storm surge modeling, a section on the Community Rating System, and other resources for more information on hazards and mitigation.
Implementation	RVAT can be implemented as a long-term planning tool prior to an event. The Community Rating System information can be implemented as a short-term tool for mitigation.
Media Format	Web Browser (IE 5x or higher, Netscape 6x or higher)
Training Resources	Although no official training is available, the Center developed a training module for the project partners to teach them how to use the tool.
Primary User	Primary users are emergency management, concerned citizens, floodplain managers, outreach coordinators
Experience in Pacific	See CVAT
Data Requirements	See CVAT for list of data needed. If the Pacific wants to do on-line mapping, then ArcIMS and an ArcIMS server would be needed.
Known Limitations	Not having the data, software, or hardware
For More Information	*www.csc.noaa.gov/rvat* *www.csc.noaa.gov/csi*

NOAA Tutuila Hazard Assessment Tool (T-HAT)

Source	NOAA Coastal Services Center, NOAA Pacific Services Center, American Samoa Coastal Management Program (ASCMP)
Hazards Focus	Floods, Landslides, Earthquakes, Tsunamis
Description	The T-HAT is a lightweight, easy to use Internet mapping application developed to assist the ASCMP in incorporating site specific hazard analyses in their permitting processes on Tutuila.
Primary User	ASCMP
Media Format	ArcIMS (Web-based mapping)
Training Resources	The tool includes a "Steps" utility and help section to guide the user through the application.
Secondary User	Planners, officials, and emergency management
Experience in Pacific	This tool is currently being used by the ASCMP.
Data Requirements	There are no data required when using the tool. However, the methodology used to create the tool can be applied to other islands provided relevant data are available.
Known Limitations	This tool assesses the potential hazard risk for specific, user defined locations.
For More Information	*http://ekman.csc.noaa.gov/t_hat/viewer.htm or John Marra, NOAA PSC – John.Marra@noaa.gov*

NOAA OCS NOWCOAST

Source	NOAA NCS
Hazards Focus	
Description	nowCOAST is a web mapping portal providing spatially-referenced links to thousands of real-time coastal observations and NOAA forecasts of interest to the marine community. The portal serves as a "one-stop shopping" web site to real-time coastal information from a variety of Internet sites both within and outside of NOAA.
Implementation	
Media Format	
Training Resources	
Primary User	nowCOAST is designed to be a planning aid to assist recreational and commercial mariners, coastal managers, HAZMAT responders, computer modelers, and marine educators to discover and display real-time information for their particular needs and geographic area of interest.
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	*http://nowcoast.noaa.gov/*

NOAA NWS / NCDDC Collaborative Oahu Surf Forecast

Source	NOAA NWS/NCCDC
Hazards Focus	
Description	EXPERIMENTAL COLLABORATIVE NEARSHORE SWELL AND WIND FORECAST FOR OAHU
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	*http://www.prh.noaa.gov/hnl/Products/SRF.php*

NOAA Coastal Hazards Information Management System (COHIS)

Source	NOAA NOS Coastal Services Center / Office of Coastal Resource Management
Hazards Focus	
Description	COHIS is an ArcView-based system modeled after South Carolina's Office of Ocean and Coastal Resource Management's "Post Hurricane Recovery Project." South Carolina OCRM's project was developed through a partnership with NOAA's Coastal Services Center, Coastal Management Fellowship, and SC Sea Grant Consortium. The COHIS project includes a digital orthophoto basemap, digitized parcel data, ownership information, and a GPS referenced photographic inventory of all shoreline structures on Georgia's four developed barrier islands: Tybee Island, Sea Island, St. Simons Island, and Jekyll Island. By acquiring this information and packaging it in an ArcView project in advance of a major storm, the process of performing damage assessment following a storm will be greatly enhanced.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.ocrm.nos.noaa.gov/czm/cohis/ProjectSummary.html

NOAA Damage Assessment Tool

Source	NOAA NOS Coastal Services Center
Hazards Focus	To maximize the utility of the parcel database for damage assessment purposes, a special user interface was developed to simplify and guide the data entry and analysis process in an ArcView® 3.1 GIS environment.
Description	Many communities throughout the country are investing in GIS-based parcel inventories. There are numerous potential uses for geographically accurate property ownership and land value data. One potential use for this type of data is to support quick and accurate damage assessments after a disaster strikes. Local officials are responsible for establishing and training damage assessment teams to go out into the field after an event to estimate the magnitude of disaster impacts. The results of these surveys are used primarily to determine resource requirements and to request state and federal disaster assistance. The accuracy of this information, however, is often questionable and the use of these damage assessments for broader analytical purposes is usually extremely limited. The use of GIS, however, can potentially simplify the damage assessment process, create more accurate results, and develop detailed data for analyzing disaster impacts.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.csc.noaa.gov/products/nchaz/htm/dassess2.htm

NOAA LIDAR Data Retrieval Tool (LDART) and associated LIDAR tools

Source	NOAA NOS Coastal Services Center
Hazards Focus	
Description	LIDAR Data Retrieval Tool (LDART) **LIDAR Loader Extension.** This extension was created for users to import LIDAR data sets directly into ArcView. LIDAR data are composed of elevation measurements of the beach surface and were acquired during aerial topographic surveys. LIDAR Data Handler In order to provide our customers with tools to manipulate the LIDAR data, we developed an extension to ArcView®, called the LIDAR Data Handler. This extension requires the user to have Spatial Analyst, because the tools in the Handler were developed to work with the Arc/Info Grid format. You can use data that you downloaded from LDART and interpolated to a surface, or you can download some sample data files below that have been interpolated already. These files are in the binary raster file format, which is described in the metadata for each file.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.csc.noaa.gov/cgi-bin/crs/tcm/ldart_start.pl http://www.csc.noaa.gov/crs/tcm/lidar_handler.html

NOAA Dune Hazard Assessment Tool (DHAT)

Source	NOAA NOS CSC
Hazards Focus	Coastal flooding and erosion.
Description	The Dune Hazard Assessment Tool is a GIS tool (in the form of an ArcView® extension) that allows coastal planners to predict the impact of erosion on oceanfront properties and developments.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.csc.noaa.gov/beachmap/html/dune_model.html

NOAA NCDDC Demographic Vulnerability Assessment Tool

Source	
Hazards Focus	
Description	The The DVAT works with demographic type data to display high risk demographic areas as defined by the user. The tool was developed as a wizard type walk-through, asking the user how to handle a situation, and giving background information or examples along the way..
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	*http://www.ncddc.noaa.gov/cra/AssessmentTools/*

NOAA NGDC Natural Hazards Resource Directory

Source	NOAA NGDC
Hazards Focus	
Description	
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://www.ngdc.noaa.gov/seg/hazard/resource/

Prescott College - Spatial Growth Model

Source	Prescott College, Sustainability and Global Change Program/Blueline Group; Wilson W. Orr, Director, 220 Grove Ave., Prescott, AZ 86301 worr@pprescott.edu; 928-899-6365; *www.blueline-group.com*.
Hazards Focus	All natural hazards. Any human caused event. Events attributes are determined by the user.
Description	The tool is a model-based, Digital Comprehensive Plan (DCP) incorporates a Spatial Growth Model which generates future growth scenarios for any size area, a Risk and Vulnerability Assessment Model (RVAM) which can overlay any disaster scenario on any current or future land use configuration and a Long Term Impact Model (LTIM) to assess the interactions among the natural and built environments. Climate change and variability impacts are assessed by both the RVAM and LTIM.
Implementation	This tool is designed to support the needs of BOTH the Planning and Emergency Management communities, thus encouraging their pre-disaster collaboration. It can be run in any time steps to serve either short term disaster assessment & operations or training – or, long term to highlight high-risk development patterns for planners and elected officials.
Media Format	The DCP is a desktop GIS application running ESRI compatible modules and extensions. Eventual versions will be web-servable; the current version is "installable" and requires 2 day's training for GIS-competent staff.
Training Resources	Source personnel provide installation, training and support. The basic model is installed at Maui County.
Primary User	Both the Emergency and Planning communities are targeted users and provide model outputs as decision support elements for decision makers – usually senior staff or elected officials. The model suite serves to elevate emergency management and mitigation to issues to the level of Community Planning.
Experience in Pacific	An installed model is currently running for Maui County; additional work is underway for Maui County to incorporate ENSO cyclic impacts on fresh water supply and storm water management. Work is underway with the Pacific Disaster Center to develop a Fire Fuels Hazard Map relating Maui fire hazards to ENSO cycles and the encroachment of urban growth into wildland areas. We have completed growth and hazard assessments for Kauai' and Maui as contributors to FEMA's Project Impact events. These were developed in collaboration with NOAA, using their Hazard Assessment Methodology. We have completed an Island-wide growth model for the Big Island under a State Civil Defense Contract. We have on-going discussions with SCD regarding a state-wide multihazard model linked to urban growth and tourism. We are a collaborator with the NOAA funded Regional Integrated Science Assessment program and will be providing the decision maker interface using the DCP model suite.
Data Requirements	As a minimum, land-use layers, flood plains/hazard areas, digital photography or satellite imagery, and a DEM are necessary. Proxy GIS layers may be used where specific data is lacking. Population increase/decrease/relocation information is also required. More data – of good quality – improves the confidence level for the model output(s).
Known Limitations	The quality and availability of the data to populate the model may limit its value.

For More Information	www.blueline-group.com and/or call Wil Orr @ 928-899-6365

USACoE Hurricane-Induced Inundation Modeling Along Island Coasts

Source	U.S. Army Corps of Engineers, Engineer Research & Development Center
Hazards Focus	Storm wave run up, wave setup, and storm surge.
Description	The island coastal inundation model is a combination of modeling tools used to determine stage-frequency information in island environments that may include fringing reefs.
Implementation	The island coastal inundation model has been used only for long-term planning and establishing FEMA flood zones, but work has begun to adapt the model for use as a warning and post-storm analysis tool in the short term.
Media Format	The present model consists of stand-alone software.
Training Resources	Training resources are in an early stage of development.
Primary User	Planners in FEMA and the U.S. Army Corps of Engineers
Experience in Pacific	The model has been applied to selected coasts on the following Pacific Islands: Rota, Guam, Saipan, and American Samoa.
Data Requirements	The model requires standard information about tropical storm track and intensity, specification of coastlines for the island to be modeled and any nearby islands, and local bathymetry and topography for the coastal areas to be modeled.
Known Limitations	The model is designed for practical application to relatively long stretches of coast with a wide variety of nearshore bathymetry, including fringing reefs, and coastal topography. Surf zone bathymetry and topography are represented as a series of representative one-dimensional profiles placed as needed to capture local variations. Up to 374 profiles have been used in previous studies.
For More Information	A report on the most recent application is available at http://libweb.wes.army.mil/uhtbin/hyperion/CHL-TR-04-1.pdf. Additional information is available from Dr. Edward F. Thompson, 601-634-2027, e-mail Edward.F.Thompson@erdc.usace.army.mil.

USACoE CEDAS - Coastal Engineering Design and Analysis System

Source	U.S. Army Corps of Engineers, CEDAS - Coastal Engineering Design and Analysis System
Hazards Focus	Storm wave run up, wave setup, and storm surge, shoreline change, beach profile change.
Description	CEDAS - Coastal Engineering Design and Analysis System GENESIS, SBEACH, BMAP GENESIS (Generalized Model for Simulating Shoreline Change) - simulates the long-term platform evolution of the beach in response to imposed wave conditions, coastal structures, and other engineering activity (e.g., beach nourishment).
Implementation	SBEACH (Storm-induced BEAch CHange Model) - simulates cross-shore beach, berm, and dune erosion produced by storm waves and water levels. (Short-term Analysis) BMAP (Beach Morphology Analysis Package) - a collection of automated and interactive tools to analyze morphologic and dynamic properties of beach profiles. BMAP is dynamically linked with SBEACH to support beach erosion analysis. (Short-term Analysis) NEMOS (Nearshore Evolution MOdeling System) is a set of models used for simulating long-term beach evolution in response to imposed wave conditions, coastal structures, beach nourishment, and other engineering activity. (Long-term Analysis)
Media Format	The present model consists of stand-alone software.
Training Resources	Training resources are available through documentation and online support.
Primary User	Planners, Coastal Engineers, researchers
Experience in Pacific	The model has been applied to some of the primary island of Hawaii. Known projects in Barber's Point and Kaanapali Beach, Hawaii.
Data Requirements	The model requires standard information about wave energy and direction, specification of coastline orientation for shoreline change modeling, sediment characteristics, existing coastal structures and local bathymetry and topography for the coastal areas to be modeled.
Known Limitations	The model is designed for practical application to relatively long, continuous stretches of coast with a wide variety of nearshore bathymetry and coastal topography. Limited use in carbonate systems with reef structures present. No way to represent a no-erodable surface (reef or beach rock). Assumes all profile is erodable, except manmade structures that are input as structures.
For More Information	*CEDAS is a proprietary software product. All non-Corps users should e-mail or call Veri-Tech, Inc. (601) 636-1454* *http://chl.erdc.usace.army.mil/CHL.aspx?p=s&a=Software;11*

USACoE Sea, Lake, and Overland Surge from Hurricanes SLOSH

Source	USACoE
Hazards Focus	
Description	The **Sea, Lake, and Overland Surge from Hurricanes (SLOSH) model** was developed by the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS). The model identifies the potential surge zones associated with the various storm categories on the Saffir-Simpson hurricane scale. The SLOSH model is a diagnostic model in that the hurricane's track, size, and intensity must be specified before the model is run. When these parameters are put into the model, a model wind field is produced, which in turn gives the surface stresses. The stresses act as the driving forces to move the water. Friction, the surface wind stress, and the pressure gradient cause the water to pile up along the coast. The model repeatedly sends the theoretical hurricanes into shore at various angles of approach. The end result is a worst-case scenario for the geographic region under study. A maximum depth of inundation is calculated for each and every location on the map. The output from the model is used by emergency preparedness professionals to decide who may be at risk from an approaching hurricane.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	

USACoE Mass Management Tool	
Source	
Hazards Focus	
Description	
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	

USACoE GENESIS Shoreline Analysis	
Source	
Hazards Focus	
Description	
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	

USACoE Storm-induced BEAch CHange Model (SBEACH)

Source	USACoE
Hazards Focus	
Description	The Storm-induced BEAch CHange model (SBEACH) is a numerical simulation model of cross-shore beach, berm, and dune erosion produced by storm waves and water levels. The model is applied in beach fill project design and evaluation and in other studies of beach profile change. SBEACH operates in the CEDAS graphical user interface designed to facilitate data input, model setup and execution, and analysis of model results.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	

USACoE - Beach Morphology Analysis Package (BMAP)

Source	US Army Corps of Engineers
Hazards Focus	
Description	The Beach Morphology Analysis Package (BMAP) is a collection of automated and interactive tools to analyze morphologic and dynamic properties of beach profiles. BMAP is dynamically linked with the SBEACH model to support studies of cross-shore modeling of beach erosion, and can be operated as a stand-alone program for general analysis of beach profile shape and beach profile change. The program operates in the CEDAS graphical user interface which enables rapid and intuitive analysis and manipulation of large amounts of beach profile data.
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	

USACoE SWAN wave transformation model	
Source	
Hazards Focus	
Description	
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	

USGS Coastline Extractor

Source	United States Geological Survey
Hazards Focus	
Description	
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://rimmer.ngdc.noaa.gov/coast/

USGS Landslide Inventory and Hazard Maps of Chuuk State

Source	United States Geological Survey (Ed Harp)
Hazards Focus	Landslides, both earthquake-induced and climate-related.
Description	Landslide inventory maps show exact positions of landslides triggered by Typhoon Chata'an. The landslide hazard map depicts those areas that are high, medium, or low hazard from landslides that might be triggered by a storm similar to Chata'an.
Implementation	The landslide hazard map should be used by the populace to identify areas that are the least hazardous so that buildings (houses, churches, schools, etc.) could be targeted to be shelters for people when a future typhoon or intense tropical storm is forecast or being tracked by the local NOAA office on Weno Island.
Media Format	To be useful to local residents, the maps will need to be in hard copy. Few have computer capabilities in Chuuk, and the maps don't lend themselves to efficient on-screen use.
Training Resources	Meetings with selected NGO's will be necessary to train them in the use of the maps so that they can meet with the appropriate mayors and community leaders to explain the maps and get local commitment to use them in a systematic way. I am working with the center for Disease Control and Prevention in Atlanta to do a pilot project in Chuuk to show that landslide hazard maps can prevent future deaths and injuries to the island's population if used properly.
Primary User	The local populace of Chuuk, the NGO's advising the people, and appropriate government agencies.
Experience in Pacific	Other landslide problems in Micronesia have been addressed on the island of Pohnpei from Typhoon Isa in 1997. Landslide hazards were evaluated and recommendations made.
Data Requirements	The landslide hazard maps require an existing topographic base from which to calculate a slope map, a geologic map from which to estimate shear strength data if no geotechnical data exists, and aerial photography or an aerial overflight from which to construct a landslide inventory map.
Known Limitations	Accuracy of landslide locations are generally from one to 10 meters depending on the scale of airphotos or visibility from overflights.
For More Information	Contact Edwin L. Harp, U.S. Geological Survey, 1711 Illinois St., Golden, Colorado, 80401, (303) 273-8557, harp@usgs.gov

USGS Hazard Atlas of Natural Hazards in the Hawaiian Coastal Zone

Source	USGS-UH
Hazards Focus	
Description	
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	http://geopubs.wr.usgs.gov/i-map/i2761/

USGS HazPac: An Interactive Map of the Pacific Basin People, Infrastructure, and Natural Hazards

Source	
Hazards Focus	
Description	
Implementation	
Media Format	
Training Resources	
Primary User	
Experience in Pacific	
Data Requirements	
Known Limitations	
For More Information	

University of Hawai`i Historical Shoreline Mapping- Pacific Geomatics Software

Source	University of Hawaii, Coastal Geology Group Historical Shoreline Change Mapping
Hazards Focus	Historical shoreline change Mapping.
Description	Mapping of historical shoreline positions. Use of georectified aerial photos for mapping the position of shoreline features representative of the shoreline position. Statistically significant (95% confidence interval) annual average erosion rates extrapolated from the shoreline positions.
Implementation	Long-term decision-making by mitigation planners/resource managers (Long Term).
Media Format	The present model (PCI) consists of stand-alone software but the process is multi-disciplined and involves a variety of steps using separate software.
Training Resources	Training resources are available through documentation and online support for PCI. The mapping is carried out through the University of Hawaii and is not readily translatable without intensive training.
Primary User	Data products (maps) are used by Planners, Coastal Engineers, developers, researchers
Experience in Pacific	The model has been applied to the sandy shorelines of Maui.
Data Requirements	The model requires historical aerial photos and beach profile data.
Known Limitations	The model is reliant on historical aerial photos that may be limited in spatial resolution. Seasonal timing of the photos can induce uncertainty to the project.
For More Information	*PCI is a proprietary software product.* http://www.pci.on.ca/ *The Coastal Geology Group has implemented a shoreline change model using this software.* *http://www.soest.hawaii.edu/coasts/cgg_main.html* *http://www.co.maui.hi.us/departments/Planning/erosion.htm*

PDC Asia Pacific Natural Hazards and Vulnerabilities Atlas

Source	Pacific Disaster Center (PDC), Maui, Hawaii, www.pdc.org
Hazards Focus	Recent/active volcanoes, tropical storms, earthquakes, wildfires (these are tracked dynamically) Historical volcanoes, earthquakes, tropical storms, tsunamis
Description	The Asia Pacific Natural Hazards and Vulnerabilities Atlas provides a dynamic geospatial framework through which information may be accessed and viewed over the Internet by the disaster management and humanitarian assistance communities. A principal objective of the Hazards Atlas is to provide decision makers with greater awareness of the risks of natural hazards in their area of concern and provides a venue for exploring regional and national level issues related to risk and vulnerability and for assessing impacts of natural hazard events.
Implementation	This tool is intended to support longer-term decision-making by mitigation planners/decision makers.
Media Format	This tool is available on the Internet at: http://atlas.pdc.org or from the PDC website at: www.pdc.org and is best viewed in a windows environment using Microsoft Internet Explorer 5+.
Training Resources	Web site instructions are provided on the Hazards Atlas launch page. See Info Button, Help Button and Case Study Button located at the top of the launch page.
Primary User	Disaster/emergency management and humanitarian assistance communities.
Experience in Pacific	Projects using the Hazards Atlas include following partners: Center of Excellence (COE), Asian Disaster Preparedness Center (ADPC), Naval Pacific Meteorology and Oceanography Center at the Joint Typhoon Warning Center (NPMOC/JTWC), Philippines - Office of Civil Defense, Hickam Air Force Base
Data Requirements	None
Known Limitations	None
For More Information	More information is available at: http://atlas.pdc.org. Contact Mr. Chris Chiesa, PDC, at 808-283-8679.

PDC Tsunami Travel Time Model and Automated Tsunami Alert System

Source	Pacific Disaster Center (PDC), Maui, Hawaii, www.pdc.org
Hazards Focus	Tsunamis in the Pacific Region
Description	The Pacific Disaster Center, in partnership with state, federal, and local disaster management agencies, has developed an effective, prototype Automated Tsunami Alert System for emergency response and situational awareness that is fully operational for the Hawaiian Islands. The alert system provides effective alert and notification for Hawaiian emergency responders for any significant earthquake that could generate a tsunami traveling towards Hawaii. The outcome of the automated tsunami alert is to provide adequate warning and situational awareness to all response officials prior to the arrival of a tsunami in order to complete timely evacuation of identified low-lying areas, possibly saving lives.
Implementation	The system has been developed in partnership with the Richard H. Hagemeyer Pacific Tsunami Warning Center (PTWC), the University of Hawaii, and Hawaii State Civil Defense Agency. The system was deployed in 1999 and has been operational since 1999.
Media Format	This tool is available on the Internet at: emops.pdc.org and is best viewed in a windows environment using Microsoft Internet Explorer 5+. Register via the website to obtain a username and password.
Training Resources	User-friendly interface. A professional paper is available explaining the system as well as a PowerPoint slide set. Paper is titled, *Pacific Disaster Center's Automated Tsunami Alert System For Hawaii With Applications For Japan And Other Tsunami-Prone Pacific Islands And Nations.*
Primary User	Disaster/emergency management and humanitarian assistance communities.
Experience in Pacific	Pacific Tsunami Warning Center; International Tsunami Information Center; Hawaii State Civil Defense.
Data Requirements	Tsunami bulletins issued by the Pacific Tsunami Warning Center.
Known Limitations	This model calculates travel times for possible tsunamis that might be generated by earthquakes within the Pacific Region. It does not predict whether a tsunami has actually been generated.
For More Information	More information is available by contacting Mr. Jim Buika, PDC at (808) 891-7913.

PDC Asia Pacific Natural Hazards Information Network (APNHIN)

Source	Pacific Disaster Center (PDC), Maui, Hawaii, www.pdc.org
Hazards Focus	Natural Hazards (tropical storm, earthquake, wildfire, tsunami, flood, volcano)
Description	The Asia Pacific Natural Hazards Information Network (APNHIN) directly supports disaster and resource managers, planners, governments, and nongovernmental organizations with a suite of applications and information services designed to search for, evaluate, and access high-quality geospatial data for natural hazard applications within the Asia Pacific region. APNHIN comprises a community of organizations who create and share disaster and hazards-related information.
Implementation	APNHIN is a web-based metadata search tool. It is based on a Distributed Information Network model in which participating organizations provide metadata to a central database hosted and maintained by PDC. The metadata records describe geospatial data resources available through the participating organization. APNHIN is implemented using ESRI's "Geography Network" framework.
Media Format	Web-based access to metadata and geospatial data. Most data sets can be accessed by FTP. Others are available as "data services" to desktop GIS applications such as ArcMap. In some cases, data are available on CD-ROM or DVD.
Training Resources	Training resources are available through documentation and online support. PDC organizes regional workshops supporting establishment of APNHIN nodes. Contact PDC (apnhin@pdc.org) for more details.
Primary User	Disaster Managers; Resource Managers; Technical staff supporting Decision/Policy Makers.
Experience in Pacific	Publicly accessible worldwide since its launch in May 2004. Participating organizations presently include PDC, USGS, GISTDA (Thailand). The user-base is diverse and includes disaster managers in Thailand, the Philippines and Vietnam, US PACOM, COE-DMHA, and Hawaii State Civil Defense.
Data Requirements	None – APNHIN is a data access mechanism.
Known Limitations	Data availability is not uniform throughout region but is expected to continue to develop over time.
For More Information	www.pdc.org, apnhin.pdc.org or contact Mr. Chris Chiesa, PDC 808-283-8679.

PDC Hawaii County Remote Information Service (HCRIS)

Source	Pacific Disaster Center (PDC) and County of Hawaii, Hawaii
Hazards Focus	The Hawaii County Remote Information Service data layers include FEMA flood zones, tsunami evacuation zones, historical tsunami run-up heights, basic infrastructure, facilities, and imagery. Other GIS layers are also available.
Description	This PDC-designed and hosted ArcIMS-based map service utilizes existing data from PDC's Enterprise Geospatial Database (EGDb), and data resources provided by the Hawaii County Data Systems Department, providing secured remote spatial information services for Hawaii County. Relative to the available hazard and infrastructure data, customized tools may be used to perform queries, plan evacuation routes, identify risk areas, and determine ownership of places of interest.
Implementation	This tool is intended to support short- and long-term decision-making by disaster/emergency management personnel, planners, and decision makers. Hawaii County Data Systems plans to internalize the HCRIS in Hilo, Hawaii in future.
Media Format	This tool is available on the Internet at http://www.pdc.org/hcris/ and requires a username/password to access the viewer.
Training Resources	In addition to a Help Button, formalized training sessions were provided to Hawaii County users. Training Manual is available.
Primary User	Disaster managers, emergency services, planning community, decision makers.
Experience in Pacific	This decision support tool is restricted the Hawaii County. However, similar ArcIMS map services have been developed and deployed by the PDC for American Samoa and Marikina City, Philippines.
Data Requirements	None
Known Limitations	None
For More Information	More information is available at http://www.pdc.org/hcris/. Contact Mr. Chris Chiesa at cchiesa@pdc.org (808-283-8679)

PDC Hazards US (HAZUS) Applications for Hawaii State Civil Defense and Hawaii HAZUS Atlas (online application)

Source	Pacific Disaster Center (PDC), Maui, Hawaii, www.pdc.org
Hazards Focus	Earthquakes
Description	PDC, in collaboration with and guidance from the Hawaii State Earthquake Advisory Committee has develop HAZUS loss estimates for up to 20 hypothetical earthquake scenarios. The results of these scenarios can be queried on line at URL mentioned below.
Implementation	This tool is intended to support longer-term decision-making by mitigation planners/decision makers as well as to provide immediate response situational awareness capabilities for Hawaii responders following an actual earthquake.
Media Format	This tool is currently located on a host computer at the PDC. Output is provided by html slides using the Hawaii HAZUS Atlas: http://www.pdc.org/hha/html/hzshome.jsp
Training Resources	PDC has provided Hawaii HAZUS Atlas training recently to the County of Hawaii on 02.25.05.
Primary User	Hawaii disaster/emergency management and humanitarian assistance communities.
Experience in Pacific	PDC has run HAZUS for Hawaii State Civil Defense for tsunami exercises and as part of the Hawaii HAZUS Atlas project. PDC has run HAZUS for Alaskan earthquake exercise.
Data Requirements	Infrastructure data for region of interest and input earthquake parameters.
Known Limitations	Predictive model. Inventory of structures must be modeled to accurately predict losses.
For More Information	More information is available at: http://www.pdc.org/hha/html/hzshome.jsp and http://www.pdc.org/earthquake_modeling.php PDC contact in Andrea Chatman achatman@pdc.org.

PDC Hazard Modeling Suite: HAZUS, CATS, MIDAS-AT, TAOS/HURAPAK, M2M Dambreak, & Others

Source	Pacific Disaster Center (PDC), Maui, Hawaii, www.pdc.org maintains and runs a suite of PDC proprietary and third party hazard models including, HAZUS, CATS, MIDAS-AT, TAOS/HURAPAK, M2M Dambreak, and others. PDC runs, processes, interprets, integrates with GIS, and disseminates the impact, loss, and or damage estimation results to decision makers.
Hazards Focus	Natural and and technical hazards.
Description	**HAZUS:** Hazards United States. FEMA's Software Program for Estimating Potential Losses from Disasters **CATS:** Consequence Assessment Tool Set. Model assesses the consequences of technological and natural disasters to population, resources, and infrastructure. Hazards accounted for in CATS range from natural disasters such as hurricanes and earthquakes, to technological disasters such as industrial accidents, terrorism and acts of war. **MIDAS-AT:** Meteorological Information and Dispersion Assessment System Anti Terrorism. model calculates plume dispersion characteristics for accidental or intentional toxic releases. Plume outlines depict levels of risk to human health. **TAOS (The Arbiter of Storms) and HURAPAK (Hurricane Analysis Package):** TAOS/HURAPAK simulate the wind, wave, and storm surge from meteorological hazards. **M2M Dambreak Failure:** M2M provides a bridge between the National Weather Service's FLDWAV models and the capabilities of the ArcView Geographic Information System. By translating the FLDWAV output into an ArcView grid, or map, the M2M application transports the user from a textual context to a spatial context, providing a visual representation of the flood waters, and thereby facilitating further analysis of the flood's impact.
Implementation	These models provide impact, loss, and damage estimation estimation results that support emergency managers, planners, and response teams in real-time event situations, as well as for mitigation planning.
Media Format	These models run on a host computer at the PDC. Output is currently available in html format on PDC's EMOPS and EWS sites: http://emops.pdc.org/iwebemops/Users/index.html and http://www3.pdc.org/gui/login.jsp .
Training Resources	Various training is provided by HAZUS, CATS, MIDAS-AT, and TAOS/HURAPAK vendors.
Primary User	Disaster/emergency management and humanitarian assistance communities and planners.
Experience in Pacific	PDC has run HAZUS for Hawaii and Alaska. PDC completes CATS and TAOS runs for most significant tropical cyclones in the Pacific. PDC runs CATS for all Hawaii hurricanes. PDC recently completed CATS model runs for Hurricane Olaf affecting American Samoa in February 2005. PDC has created MIDAS-AT model runs for Maui County and Guam. PDC has run several M2M models for Hawaii Dept. of Land and Natural Resources.
Data Requirements	Varies per model.

	Known Limitations	Varies per model.
	For More Information	For CATS, more information is available at: http://www.pdc.org/CATS_modeling.php and http://cats.saic.com PDC contact is Andrea Chatman, achatman@pdc.org. For MIDAS-AT, more information is available at www.absconsulting.com/midas/ PDC contact is Stan Goosby, PDC, sgoosby@pdc.org. For HAZUS, more information is available at www.fema.gov/hazus/ PDC contact is Andrea Chatman, achatman@pdc.org. For TAOS, more information is available at: http://hurricane.methaz.org, PDC contact is Jeff Logan at jlogan@pdc.org. For M2M, more information is available at: http://www.pdc.org/dam_modeling.php , Stanley Goosby, sgoosby@pdc.org. (808) 280-5899.