

EMERGENCY MAPPING PROCEDURE FOR CRISIS MANAGEMENT

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Introduction

Crisis managers need clear information to quickly respond to an emergency effectively. Most emergency response plans that are created with a specific base or well-defined location in mind include detailed maps of the area of interest. Plans for areas of interest (AOI) which cover a large geographical area, cannot effectively convey detailed information to a crisis manager. Nor can any plan address any possible event, which might occur within an AOI due to the fact that incidents can occur in remote locations. An aircraft crash in central Montana is a prime example of such a situation. Montana has a very sparse population and it is likely that a crash would occur in a non-populated area.

PCCI encountered such a problem when they were tasked with writing an Oil and Hazardous Substances Spill Contingency Plan for the Navy On-Scene Coordinator (NOSC) responsible for Commander Naval Reserve Force (COMNAVRESFOR). The COMNAVRESFOR AOI covers 10 states and approximately 2300 kilometers from east to west and 5200 kilometers from north to south (Figure 1).

The COMNAVRESFOR covers the hash-marked states in Figure 1. The NOSC headquarters for this AOI is located in New Orleans, Louisiana as indicated by a star in Figure 1. The nearest possible location within the AOI is 660 kilometers away from New Orleans. The NOSC in New Orleans could not possibly keep very detailed information on such a large geographic. However, when an emergency occurs, such as an airplane crash or large oil spill, it is vital that headquarters have immediate access to information such as where the incident occurred, the weather and topographic conditions of the area, and environmentally sensitive information pertaining to the specific location. One plan can incorporate such information for a *specific* defense base, but not for a very large geographic area.

This Emergency Mapping Procedure has been developed with exactly these scenarios in mind. Geographic information for any possible area within the United States can be found using the Emergency Mapping Procedure, which utilizes the Internet extensively and is presented here. The following sections will address the varying procedures necessary to obtain detailed information for a specific AOI. The intent is for a responder to locate individual geographic information and maps. The data found at these websites cannot quickly or easily be compiled into a single map layer. It is possible, but in the interest of a quick emergency response. The websites outlined in this procedure are accurate as of December 2002. In the following procedure, COMNAVRESFOR AOI may be used as an example.

Locate the emergency location

When an emergency is first reported, crisis managers must be able to swiftly arrive at the location of interest. Directions to the emergency locations can be obtained from several different websites. <http://maps.yahoo.com> or <http://www.mapquest.com/> have directions given based on specific addresses, street names, city or town names, or zip codes. There are also CD-rom versions of this type of navigational software, including Rand McNally's Trip Maker and Microsoft's Map Point.

If a specific address or street is unknown in the emergency location, the United States Geologic Survey (USGS) has several websites that are thus useful. The USGS Geographic Names Information System (<http://geonames.usgs.gov>) allows a user to input a name of a place along with a feature type and state location, and then retrieves either an aerial photo or USGS topographic quadrangle map from the query.

The USGS's GISDATA Web mapping Portal is an interactive mapping tool (<http://gisdata.usgs.net/>). From this website select the link on the upper right side of the page to "U.S. Landsat and National Datasets" (it links to page: <http://gisdata.usgs.net/website/landsat/viewer.htm>) . This brings up an interactive browser of various layers for the United States. Certain layers are only active as you zoom into the appropriate scale. Items such as roads, populated places, streams and orthoimagry can be viewed through this portal.

Determine the weather at the specified location

Emergency personnel must be prepared for all types of weather. The region of interest encompasses a wide geographical range. For example, weather in the northern states such as Montana or North Dakota could be hot in the summer months or cold with blizzard conditions in the winter months. Also, in the summer, tornadoes could be present in states such as Kansas or Nebraska. Information concerning the weather can easily be obtained from <http://www.weather.com/> , the homepage for the Weather Channel. A responder can input the city or town name, or the zip code for the area of interest and retrieve the information instantaneously. A second source of information is the National Weather service at <http://www.srh.noaa.gov/>.

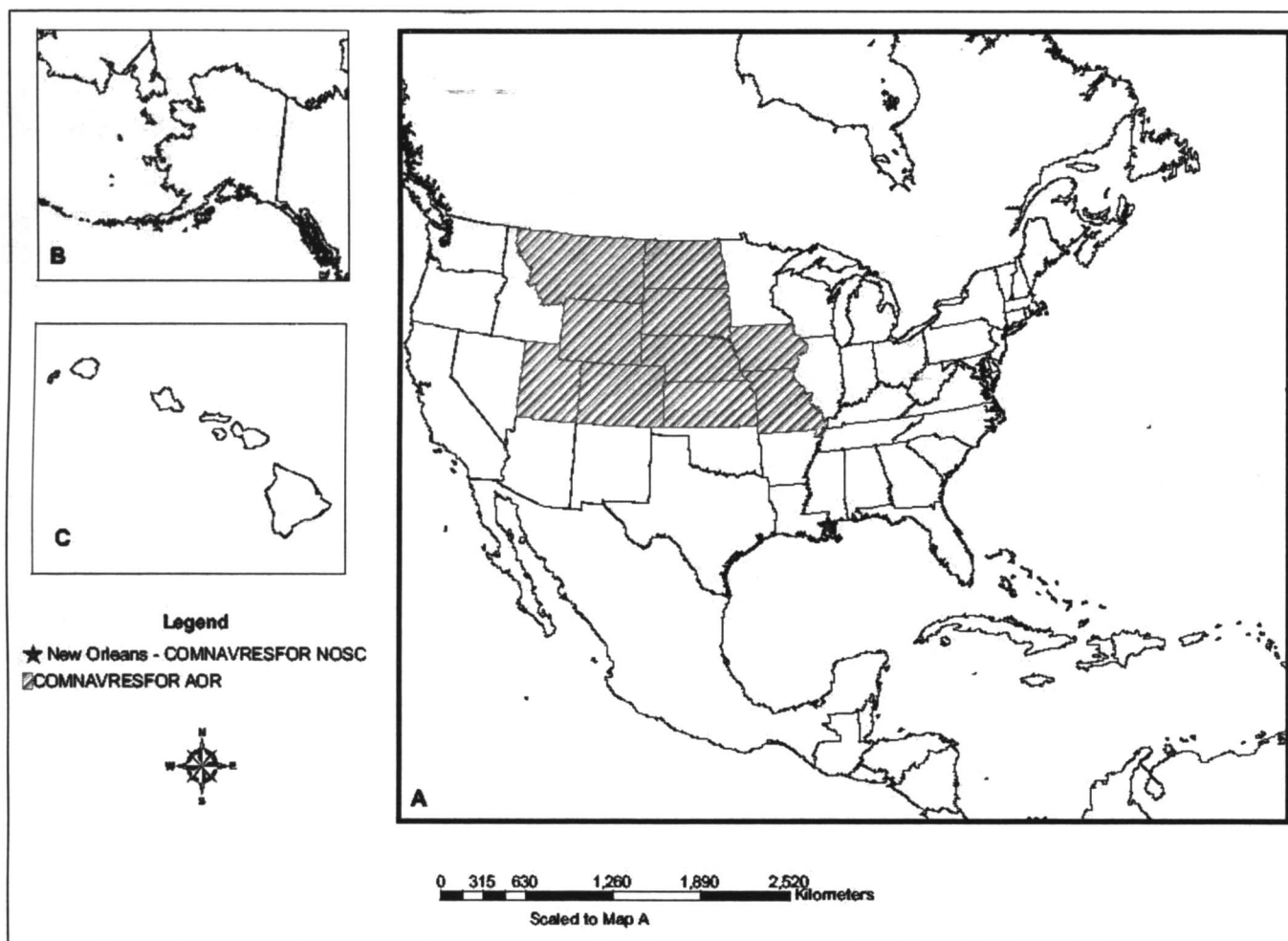


Figure 1. CONUS NOSC area of responsibility.

Locate emergency responders

Other local response information that can be of assistance is the location and phone numbers for the nearest police and fire departments. For personnel near the scene of the incident, the most effective way to reach local emergency responders is to phone 911. However, for those farther away from the scene, there may still be a need to contact the local emergency responders. Fire stations nationwide can be located at <http://home.flash.net/~jturner/> and police stations nationwide can be located at <http://www.officer.com/>. These local responders are often first on-scene and are able to relay accurate initial assessments. Contacting the local Oil Spill Response Organization (OSRO) for an oil spill would also be a helpful asset. The local OSRO is normally called to the scene within minutes. A crisis manager from afar would be able to glean much information from them. An OSRO listing by Captain of the Port zone can be found at <http://www.uscg.mil/hq/g-m/nmc/response/zone.pdf>.

Determine the local terrain

The topography of the various regions can vary significantly in the COMNAVRESFOR AOI. The topography in Kansas is relatively flat, whereas the topography in Utah is fairly

mountainous. This can result in very different emergency response requirements or approaches. A responder can obtain topographic maps through the website <http://www.topozone.com/>.

Locate facility information

If an incident occurs on a Department of Defense facility, a crisis manager will want to locate the pertinent facility information. Facility information that would be useful to consider in the case of an emergency response are streams or other water networks, fuels lines, natural areas, natural disaster areas, or environmental constraints. This information can be found within a facility's CADD drawings (if such drawings exist). The regional headquarters will have access to 24-hour phone numbers for each facility under its command. By contacting the 24-hour emergency number, an operator can direct a crisis manager to the correct source of information.

Additional facility information that would be of use would include the facility's SPCC plan or the regional Area Contingency Plan (ACP). ACPs are posted at <http://www.nrt.org>, however the site is currently offline. The Coast Guard National Response Center can be contacted directly to obtain ACPs at 1-800-424-8802.

Identify environmentally sensitive areas

When an emergency occurs, one of the most vulnerable areas is one that has special environmental considerations. With the large area of interest, guidelines are presented here on how to obtain current information pertaining to environmentally sensitive areas in any region of the country.

Some sensitive area such as federal lands (including national parks and Native American Reservations) can be obtained through the Environmental Science Research Institute (ESRI)'s Geography Network website (<http://www.geographynetwork.com>).

Wildlife that is in the immediate vicinity of an emergency must be quickly attended to. For example, nesting bird sites can be determined through <http://i-bird.com/USDirectory.htm>. United States Forests can be located on the United States Forest Service's web page at http://www.fs.fed.us/recreation/map/state_list.shtml.

Other environmental resources such as geology, agricultural areas, and mining regions can be accessed through various sites. Geology for the western portion of the country can be found at <http://wrgis.wr.usgs.gov/>, geology for the eastern part of the country can be found at <http://geology.er.usgs.gov/>, geology for the central portion of the country can be found at <http://geology.cr.usgs.gov/>, and overall information can be found at <http://www.usgs.gov>. The Department of Agriculture can be accessed at <http://www.usda.gov/> and the State Department of Natural Resources can be found at http://www.sfr.cas.psu.edu/Employment/State_Agencies.htm. Further information concerning national forests, mining, and grazing lands can be accessed through the Bureau of

Land Management at <http://www.blm.gov>. Other information on weather or climate can be accessed through the National Oceanic and Atmospheric Administration (NOAA) (<http://www.noaa.gov>).

Some resources such as wildlife refuge areas and threatened and endangered species could normally have been found through the Fish and Wildlife Services <http://endangered.fws.gov/wildlife.html>. Water supplies, which might also be a concern, were available through the Area Contingency Plans on the National Response Team website <http://www.nrt.org>, but are now offline. The Environmental Protection Agency's website (<http://www.epa.gov>) also has useful information on various environmental issues.

Conclusion

An Emergency Mapping Procedure can be very useful for crisis managers that need quick access to geographic information covering a very specific location, which is far away. Preparing a few regional maps ahead of time and providing the means necessary to obtain specific local information (i.e. websites, data CDs) is a useful technique for an emergency contingency plan. The use of this Procedure eliminates the need for large quantities of small-scale maps covering an entire region to be included in an emergency response/contingency plan. Many different types of information can be accessed from the Web and thus, make a crisis response much more efficient. It is also helpful to become familiar with the websites and data CDs used in this Emergency Mapping Procedure prior to an emergency.

Website index.

WEBSITES

http://maps.yahoo.com/	Yahoo
http://www.mapquest.com/	Mapquest
http://geonames.usgs.gov	USGS Geographic Names Information System
http://gisdata.usgs.net/	USGS GISDATA Web Mapping Portal
http://gisdata.usgs.net/website/landsat/viewer.htm	USGS – The National Map (Interactive)
http://www.weather.com/	The Weather Channel
http://www.srh.noaa.gov	The National Weather Service
http://home.flash.net/~jturner/	Fire Stations
http://www.officer.com/	Police Stations
http://www.uscg.mil/hq/g-m/nmc/response/zone.pdf	OSRO Classifications by COTP Zone
http://www.topozone.com/	Topographic Maps
http://www.nrt.org/production/nrt/home.nsf	National Response Team
http://www.geographynetwork.com	ESRI's Geography Network
http://i-bird.com/USDirectory.htm	Nesting Bird Sites
http://www.fs.fed.us/recreation/map/state_list.shtml	US Forest Service
http://wrgis.wr.usgs.gov	Western US Geology
http://geology.er.usgs.gov/	Eastern US Geology
http://geology.cr.usgs.gov/	Central US Geology
http://www.usgs.gov	US Geological Survey
http://www.usda.gov/	US Department of Agriculture
http://www.sfr.cas.psu.edu/Employment/State_Agencies.htm	State Dept. of Natural Resources
http://www.blm.gov	Bureau of Land Mgmt.
http://www.noaa.gov/	National Oceanic and Atmospheric Admin.
http://endangered.fws.gov/wildlife.html	Fish and Wildlife Service
http://www.epa.gov	EPA

Biography

Bridgette Snyder. Ms. Snyder attended Penn State University and graduated in 1999 with a Bachelor's of Science degree in Earth Science and a Bachelor's of Arts in French. She has worked for PCCI since 2000 and is currently project manager for all GIS-related projects. She also has experience in 3D modeling and the creation of specialized GIS systems for regions such as the Black Sea. Other publications include *Flood and Drought Cycles in the Susquehanna River Basin and the Future Implications of Global Climate Change on the Susquehanna River Basin* which is published at: <http://www.ems.psu.edu/info/explore/SusqRivBas.html>

Christina Barchers. Ms. Barchers attended the University of Virginia and graduated in 2001 with a Bachelor's degree in

Environmental Science. Christina has been with PCCI since 2001 and has worked on regional and local Oil and Hazardous Substance Spill Contingency Plans. She uses a variety of drawing, mapping, and modeling software including ArcView 8.2, AutoCAD 2002, Solid Edge, and OilMap.

References

1. *COMNAVRESFOR Navy On-Scene Coordinator Oil and Hazardous Substances Spill Contingency Plan; PCCI, Inc.; 2002.*