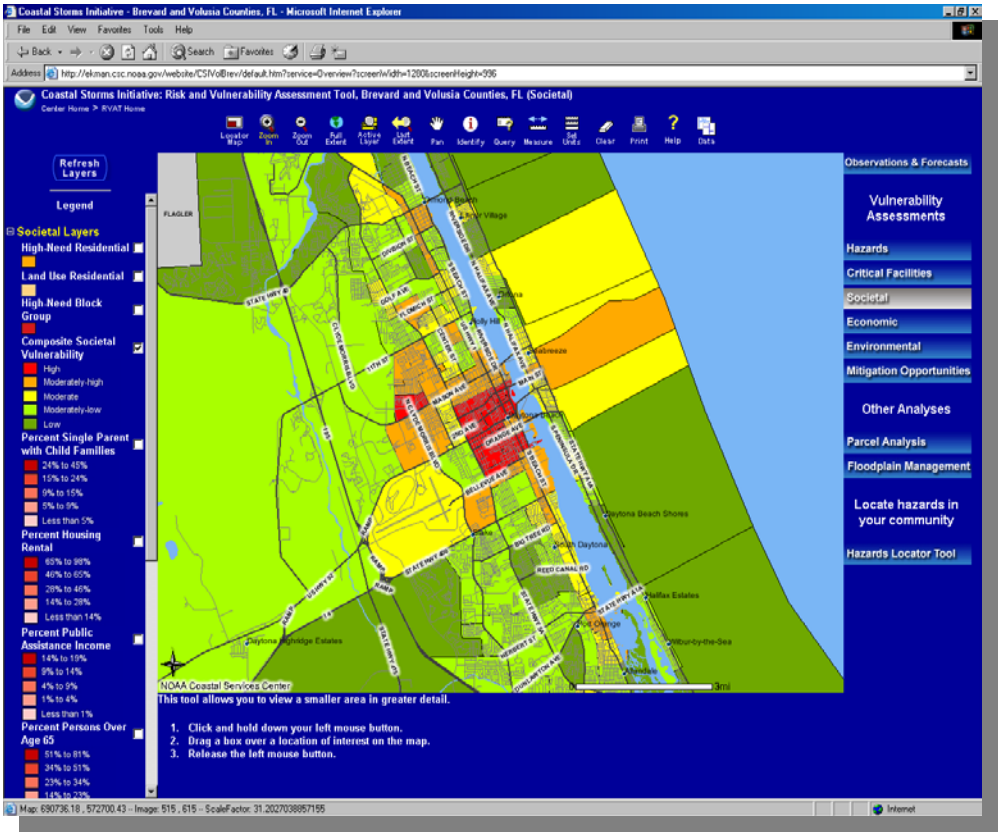
Coastal Storms Initiative—Florida Pilot
Risk and Vulnerability Assessment Tool

Lessons Learned Report



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1. Introduction

This lessons learned report was developed in conjunction with the National Oceanic and Atmospheric Administration (NOAA) Coastal Storms Initiative (CSI) and pertains to Project 7—Risk and Vulnerability Assessment Tool (RVAT). This tool was developed as part of the initiative by the NOAA Coastal Services Center (Center) for Brevard and Volusia Counties in Florida. The purpose of this report is to bring together lessons learned during the project that can be usefully applied to other projects with similar goals.

2. Background

The CSI RVAT was delivered on August 15, 2003. The primary aim of the project was, and is, to assist emergency managers, planners, the public, and others in their efforts to reduce hazard vulnerabilities through awareness and education, hazard mitigation, and comprehensive land-use and development planning. Demonstrating innovative and effective tools and methods for conducting a risk and vulnerability assessment (RVA), the final product consists of an Environmental Systems Research Institute® Arc Internet Map Server (ArcIMS®) application and includes a comprehensive supporting Web site.

An important facet of the project is that the tools and methods developed for and employed by Brevard and Volusia Counties are readily adaptable to other communities and areas. Included in the ArcIMS application are 10 separate but related "mapservices" featuring data and information for particular facets of an RVA. An RVA is typically viewed as a multi-step process or system of analyses, often conducted at the county or municipal level.

The RVA methodology used in the tool was based on the H. John Heinz III Center's Panel on Risk, Vulnerability, and the True Cost of Hazards (Heinz Panel) findings, as reported in the book *Hidden Costs of Coastal Hazards*. This methodology was also used in another Center project entitled the Community Vulnerability Assessment Tool (CVAT). CVAT was piloted in New Hanover County, North Carolina, and was completed in 1999. For the most part, RVAT mirrors CVAT, especially in its underlying methodology, but differs in form and function (i.e., ArcIMS versus CD-ROM).

Like CVAT, specific assessments or analyses included in RVAT include Hazards, Critical Facilities, Societal, Economic, Environmental, and Mitigation Opportunities. However, four additional assessments were included in RVAT, three of which target a particular audience (Floodplain Management, Parcel Analysis, Hazards Locator Tool). One additional mapservice, entitled Observations and Forecasts, allows users to dynamically link (via hotlinks) to real-time and near real-time atmospheric, oceanic, and hydrologic information on the Internet. The inclusion of these additional tools helped to address other multi-hazards issues, many of which were identified during the multiple partner meetings that were conducted in each county during the project's life cycle.

The structure of the ArcIMS application was driven in large part by information from project partners and future users. Initial needs assessments, formal project reviews (both internal and external), and subsequent trainings were used to guide the look and feel of both the mapping interface and the Web site. For example, project partners requested a tool simplification, the "auto-identify" function in the Hazards Locator Tool, during one of the subsequent trainings. In other evaluations, project partners recommended additional instructions and features to meet anticipated user needs.

3. Project Timeline

The CSI RVAT project was developed over the course of approximately 26 months (February 2002 to April 2004). While primary product development (data and information collection, Web site development, and ArcIMS development) took only one year, project needs assessment, scoping, and trainings added significant time on both ends of the core product development schedule. Product development and completion was possible within only one year because of the prudent distribution and sharing of tasks among project team members.

- February 2002 – Initial project kickoff meeting in Jacksonville, Florida
- May 2002 – Initial meetings (needs assessment) with project partners (Brevard and Volusia County officials)
- August 2002 – Presentation of draft ArcIMS and Web site mock-ups to Volusia County partners and feedback solicitation
- September 2002 – Presentation of draft ArcIMS and Web site mock-ups to Brevard County partners and feedback solicitation
- March 2003 – Presentation of (draft) final ArcIMS and Web site to Brevard and Volusia County partners and feedback solicitation
- August 2003 – Internal and external project reviews; project completion and delivery
- February 2004 – Training for Brevard County partners
- April 2004 – Training for Volusia County partners

The project began with a kickoff meeting in Jacksonville, Florida, located in the northeast portion of the St. Johns River Watershed Area—the initial pilot area for the CSI project. Local stakeholders were present and participated in discussions about local issues, as well as in brainstorming activities centered on development of potential project ideas. The stakeholders also assisted with narrowing the project area from the entire 19 county watershed area to just Brevard and Volusia Counties. The state hazard mitigation officer

from the Florida Division of Emergency Management (FDEM) office in Tallahassee also assisted by recommending Brevard and Volusia Counties based on his knowledge of their progressive and energetic approaches to hazard mitigation. The fact that both counties had strong hazard mitigation committees in place suggested that there would be committed and beneficial local support for the development of RVAT.

4. Data

The spatial data layers used in the CSI RVAT ArcIMS were obtained from a variety of local, state, and federal sources (see Appendix 1). In most cases, only limited processing was required to prepare the data for insertion into the mapping application, and the processing mostly took the form of spatial reprojection and/or conversion to a shapefile (if provided as an ArcInfo® coverage). In a few cases, however, a significant amount of effort was required before the information could be added as a functional data layer in the ArcIMS. In order of increasing difficulty, the following types of data all required varying amounts of processing beyond simple location, collection, and reprojection—meteorological, oceanographic, and hydrologic observing station data; critical facilities; largest employers; and data from the U.S. Census Bureau.

- The simplest data processing task (beyond mere reprojection or conversion) was the addition of hyperlinks to the data attributes from the National Weather Service (forecast zones, buoys, METAR stations), U.S. Geological Survey (river gages), and National Ocean Service (tide gages). Adding hyperlinks allowed the user to be able to link directly to the particular observing platform's Web site and view near real-time information.

- The critical facilities data set was obtained from FDEM as one homogenous data layer containing nearly 22,000 records (statewide coverage) and 96 different categories. The project team selected Brevard and Volusia Counties and then collapsed the 96 original categories into just 16 layers according to a particular emergency management function (e.g., fire and rescue facility, police station, hospital or nursing home, animal care facility, hazardous material storage site, etc.). Coordination with project partners was necessary concerning this particular data set to ensure that the generated categories were sensible in a local emergency management context.

- Largest employer data were provided to the project team simply as a list of addresses. In order for the data to be displayed in ArcIMS, it was necessary to geocode the addresses and then verify the locations using aerial photography to ensure that the geocoding process was successful (i.e., accurate). Once the team was satisfied with the placement of each building facility, a point shapefile was generated and added to the ArcIMS.

- In the case of block group data obtained from the U.S. Census Bureau, an entire methodology had to be developed and implemented to process the data so that they could be included in the ArcIMS (see Appendix 2).

4.1 Data Projections

As mentioned previously, data were collected from myriad organizations. One of the issues associated with collecting data from multiple sources is the potential discontinuity of projection information among data layers and the need to reproject data into a common projection. In most cases, documentation (or metadata) is received with data that details the projection information for that layer. When necessary, this information is used to reproject the data from its original projection into the common, project-specific projection. However, during development of the CSI RVAT, incorrect projection information was received from a source, which resulted in spatial inaccuracies when the data were reprojected. These inaccuracies were recognized by a lateral "shift" in the data layers, which usually signifies differences in horizontal datums. After careful inspection of the data, the project team realized that certain data layers had been assigned incorrect projection information because of a mistake in the data documentation. The project team contacted the data provider and received correct projection information that, in turn, allowed the team to correctly display and analyze the data.

Recommendation: data layers should be carefully checked for spatial accuracy and for their ability to be overlaid correctly with other data layers in the same projection.

4.2 Value of Local Data

Another issue with collecting data from multiple sources is the question of which data sets to use when two or more agencies or organizations have similar, yet different, data. Primarily due to a lack of coordination, different versions and editions of data were created by multiple agencies and organizations. For example, two road layers may exist for an area—one created by the state and the other by a local county agency within that state. Although the two road layers cover the same area, they differ spatially because they were created by two different groups using two different sources. The project team is then faced with the question of which road layer to use. For the CSI RVAT, the project team used local data when available. The team made these decisions based on the motto, "Locals know best." The local data proved to be more thorough and accurate both spatially and descriptively (i.e., the data's attribute information).

Recommendation: local data, when available, should be examined and, if appropriate, used before statewide or national data sets.

4.3 Data Organization

There are 121 different data layers in the CSI RVAT ArcIMS. When the project team began collecting these data, they quickly recognized the need for a systematic method of organization. Information such as file name, source, and description needed to be documented for proper incorporation into the RVAT. The project team developed an organizational spreadsheet for the purpose of capturing this and other information and tracking any changes made to the data (Appendix 1). This spreadsheet helped the project

team later create a Data Dictionary page in the Web site, which documented each layer's name, source, and value of inclusion in an RVA.

Recommendation: future data collection efforts should be documented in a similar fashion.

Although many of the Web sites consulted for spatial data were exclusive to Florida, there may be analogous sites available for other states and counties. The vast improvement in search engine technology typically makes it possible to quickly locate spatial data resources across the Internet. A comprehensive list of CSI RVAT data sources is included as Appendix 1.

5. Usability and Needs Assessment

The CSI Florida pilot project used a community-based approach to design and develop both the Web site and ArcIMS. To solicit partner feedback, several meetings were conducted with officials from each county to learn what their needs were and what types of products they would like created.

Initial draft mock-ups of the ArcIMS and Web site were created after these initial discussions with partners. Accompanying these mock-ups was a preliminary questionnaire asking the partners for feedback on the draft site plan (Appendix 3), and the comments were incorporated into the draft Web site. The next steps were to have the partners test the current site for usability. The partners were asked to perform two activities, the first of which was a "card sort." A total of 17 people from both counties participated in the card sort exercise. Partners received possible Web site section names on individual pieces of paper and were asked to sort the sections into groups and, if desired, create new names for the groups (see Appendix 3).

The results from the card sort exercise were first analyzed by the project team to find similarities and to compare the results to the project team's initial groupings. Statistical software was then used to find similar groupings or "clusters." Each grouping was entered into the USort and EZCalc software programs. The USort software is used to enter the users' results, and then the EZCalc software tries to find linkages within the data. The EZCalc software produces matrices based upon various algorithms. The project team decided to use the "Single" analysis, which looks for similarities among the data entered. The Single analysis matrix uses the "nearest neighbor" linkage rule. In this method, the distance between two clusters is determined by the distance of the two closest objects (nearest neighbors) in the different clusters.

Although the software did find some similarities among the results, the project team determined whether the initial user groupings and the cluster analysis matrix made sense based upon their knowledge of the content contained in each of the sections and discussions with project partners. In the end, the project team made the final decision on

the "bins" or "clusters" for the navigational structure. Below is an example of one of the card sort participant's groupings.

Data Analysis (main section)
Sub sections
- Societal Analysis
- Critical Facilities Analysis
- Economic Analysis
- Environmental Analysis
- Hazards Analysis

Resources (main section)
Sub sections
- FAQ
- Links
- Data Links
- Glossary

Introduction (main section)
Sub sections
- Risk and Vulnerability Assessment Overview
- Hazards Locator

Interactive Maps (main section)
Sub sections
- Risk and Vulnerability Assessment Interactive Maps
- Parcel Analysis Interactive Maps
- Community Rating System Interactive Maps
- Hazards Locator Interactive Maps

Applications (main section)
Sub sections
- Community Rating System
- Storm Surge Visualization
- Parcel Analyzer
- Mitigation Opportunities

The second activity had the attendees view a printout of the home page and answer several questions about whether the content explained the purpose of the site, the types of information found in the site, and if the site's title was clear (Appendix 3). This information was analyzed and changes were made to the layout of the home page where necessary.

5.1 Site Testing

The partners tested the site frequently and provided comments on ways to improve the content and functionality. This occurred throughout the project life cycle (including external review), up to and including after the site went live. As mentioned previously, comments from users in Brevard County led to changes (i.e., simplification) to how one of the modules functions. Furthermore, comments from users in Volusia County led to the changes in a particular data layer that was identified by them as lacking certain key information (i.e., largest municipality).

6. Training and Outreach

Since at least a portion of the project serves as an education and awareness tool for the public, it was important that both training and outreach strategies be developed and implemented following delivery of the tool.

6.1 Training

Once the product was completed, the Center developed a training module to teach the partners and other interested parties how to use the Web site and ArcIMS. The training was conducted at each county's Emergency Operations Center and was co-hosted by staff from each county. In each training instance, roughly 30 attendees were selected by project partners and represented nearly all sectors of local government, including police, fire and rescue, transportation, public works and utilities, engineering, and emergency management. County officials were given the task of choosing whom they wanted to attend the trainings, since those officials were assumed to be in the best position to decide which constituents would benefit the most from RVAT training.

Four scenarios (Floodplain Manager, Mitigation Planner, Concerned Citizen, Emergency Manager) were created to train users on how to interact with the site's interface, tools, and data. Additionally, the users were asked to answer questions specific to that perspective. Along with the training notebook, a CD-ROM was created that included all the exercises, the main presentation given prior to the start of the training (i.e., basic Center information and a demonstration of the Floodplain Management mapservice), step-by-step instructions on how to perform the exercises, a sample metadata record, and a printout of a sample map generated from the mapping application.

6.2 Outreach/Marketing

A brochure describing the Hazards Locator Tool, a mapping application created to teach the public about the risks of coastal hazards, was created by the project team in partnership with Center communications department staff, along with input from the Florida Sea Grant agent assigned to the CSI project (included in Appendix 4). Two thousand copies of the brochure were printed and were split evenly between the two

counties. Following the initial printing, 2,000 additional copies were requested by the counties and were once again provided to them for distribution to their constituents.

In addition to the brochure, an article was printed in the Center's publication *Coastal Services* (May/June 2004 issue, included in Appendix 4). The article discussed the site development process, site content, and a process for communities to build their own RVAT site.

The counties also agreed to assist with outreach by promoting the tool on their Web sites and placing links to it directly on their home pages (also included in Appendix 4).

Finally, local print and television media attended both trainings and interviewed Center project team members about various aspects of the project.

7. Conclusion

By all accounts, the CSI RVAT project was a resounding success. This success is attributable to a number of factors including regular communication between project partners and project team members; frequent on-site meetings and partner collaboration, including telephone and e-mail communication; comprehensive internal and external reviews of the Web site and ArcIMS prior to final delivery; and in-depth trainings given to partners and other local officials. Additionally, effective data organization tactics, as well as strong programming support, contributed to the creation of this informational, intuitive, aesthetically pleasing, and, above all, useful product.

Appendix 1

Data Inventory Spreadsheet and Acronym List

CSI - Volusia and Brevard Data Inventory

County Overview:	**File Name**	**In Hand**	**Source**	**Comments**
Ocean Pier				
Beach Access Site			vol	have for Vol, need Brev
Evacuation Route	evac_rte	x	fdem	
Railroad	railrd	x	fgdl	
Rivers - polys, extent of state	mjrivp	x	fgdl	
Road	streets_official	x	brev, vol	merge of Brev and Vol streets
Primary Road	esri_volbrev_primrds	x	esri	replaced the old fgdl layer
Hydrology - Polys	hydro_official	x	brev, vol	merge of Brev and Vol hydro
Place - Point	plc_pnt	x	fdep	use as transparent and label
City Limits	citylimits_clip	x	fdep	
State Boundary	florida	x	NWS	generalized florida layer
County Boundary	counties_official	x	brev, vol	merge of Brev and Vol generalized boundaries
Airports (Vol. and Brev.)	airports_poly	x	esri	
Kennedy Space Center	ksc_bnd	x	brev	
Parcels	b- parcels, v- basemap	x	prop apprs	from data/b_parcels and data/v_parcels
USGS River Gages	usgs_gages	x	fgdl, other	includes urls
SERFC Gages	serfc_gages	x	?	includes urls
METAR Stations	metar	x	?	includes urls
Co-op Stations	coops	x	?	includes urls
Offshore Bouy	bouys	x	?	includes urls
Nearshore Bathymetry	bathy2	x	fdgl	
Indian River Estuarine Bathy	indianR_bathy	x	NOAA SPO	from Special Projects Office
Geocoded roads for Brevard	tgrr0005	x	fgdl	for use in arcims, address locator tool
Geocoded roads for Volusia	volusia_georoads_prj	x	vol	for use in arcims, address locator tool
Digital Raster Graphics (DRG)- 100k	drg10005, drg10064	x	fgdl	cvat/images/drgs
Nautical Charts- 11476, -84, -86	testchart, …2, …3	x	BSB ElecCh	

CRS:	**File Name**	**In Hand**	**Source**	**Comments**
Municipal CRS Rating			csc	
County CRS Rating			csc	
Points Needed for Next Level			csc	
SFHA			csc	csc created, from Q3 fgdl
CBRA Zones			csc	
Participating CRS Communities			csc	
Participating CRS Counties			csc	
County NFIP Information			csc	

Economic Analysis:	**File Name**	**In Hand**	**Source**	**Comments**
Target Transportation	target_trans	x	csc	intersected w/ modtohigh_composite
Target Retail/Wholesale Trade	target_retail	x	csc	selected/exported by intersection w/ modtohigh_comp
Target Services	target_serv	x	csc	selected/exported by intersection w/ modtohigh_comp
Target Manufacturing	target_manufac	x	csc	selected/exported by intersection w/ modtohigh_comp
Target Agriculture	target_ag	x	csc	selected/exported by intersection w/ modtohigh_comp
Land Use- Transportation	lulc_trans	x	sjrwmd	
Land Use- Retail/Wholesale Trade	lulc_retail	x	sjrwmd	
Land Use- Services	lulc_serv	x	sjrwmd	
Land Use- Manufacturing	lulc_manufac	x	sjrwmd	this is industrial
Land Use- Agriculture	lulc_ag	x	sjrwmd	
Land Use/Land Cover	landuse_prj	x	sjrwmd	classified by Shan, displayed by class type
Large Employers	large_employers	x	csc	from vol and brev economic data- geocoded addresses

Environmental Analysis:	**File Name**	**In Hand**	**Source**	**Comments**
Solid Waste Facility	cf_solw (crit_fac)	x	fdem	
Toxic Release Inventory Site	epa_tris_3prj	x	EPA	from epa region 4 web (2/12/03)
Oil Facility	oil_fac	x	?	
NPDES Permit Site	npedes_volbrev	x	fgdl	fgdl
Hazardous Substance Disposal Site				check out EPA web
Fisheries Nursery Areas				
Significant Habitat Areas	sig_hab	x	sjrwmd	metadata: sig_hab_rsh_95.txt
Wetlands	priority_wetlands	x	fwc-oes	came from FWC-OES grid
Archeological Sites	archeo	x	?	
Superfund Sites (EPA)	cerclis	x	fgdl	
Federal Lands	fed_land2	x	natnl atlas	from usgs national atlas > layer is thorough
Flood Prone Soils	floodprn	x	fgdl	taken from soils layer
Florida Natural Areas Inventory	fnai	x	fgdl	
Historical Significant Sites	history	x	?	
National Wildlife Refuges	nwr	x	fgdl	
State Preserves	parks	x	?	
Golf Courses	golf	x	vol, brev	have Vol data as polys, brev in points, what to do???
Soils- usda replaced fgdl(more atts)	usda_volbrev_soils	x	usda/nrcs	downloaded, joined tables (taxclass), and clipped
Toxic Release Risk Area	epa_tris_3risk	x	csc	epa_tris_3prj buff by 0.25 miles
Marinas	marinas	x	fgdl	
Biodiversity Hotspots	biodiversity_hotspots	x	fwc-oes	came from FWC-OES grid

Imagery:	**File Name**	**In Hand**	**Source**	**Comments**
FGDL Aerial Photos- Brevard		x	fgdl	X/imagery/B_Sids/ - not full coverage
FGDL Aerial Photos- Volusia		x	fgdl	X/imagery/V_Sids/ - not full coverage
Brevard 2000 DOQs- color		x		X/cvat/images/2000_doqs/Brevard
Volusia 2000 DOQs- color		x		X/cvat/images/2000_doqs/Volusia
3m DOQQs		x	fgdl	on fgdl county cds - cover both counties - date?
ETM+ 1999, true color 30m		x	fgdl	X/imagery/ETM_99images
ETM+ 1999, panchromatic 15m		x	fgdl	X/imagery/ETM_99images
USGS 30m DEMs		x	usgs	X/DEMs
FGDL 1999-2000 1m color DOQQs	****using these in arcims****	**x**	**fgdl**	**4 cds, using image catalogs: N and S Vol. and Brev.**

Hazard Analysis:	**File Name**	**In Hand**	**Source**	**Comments**
Natural Hazard Summary Risk Area	composite, composite_OG	x	csc	redone: minus slr, adjusted surge
Matrix	matrix, matrix_OG	x	csc	
Storm Surge Risk Area (SLOSH)	surge_rsk_adj	x	csc/fdem	clipped ocean extent, adjusted to hydro
Flood Risk Area (Q3)	flood_rsk	x	fgdl	
Special Flood Hazard Area	sfha_official	x	csc	selected out sfha areas from sjrwmd Q3 data
Wind Risk Consideration Area (DCA)	wind_rsk	x	csc/DCA	
Erosion Risk Zones	erosion_rsk	x	csc,fdep,FSC	from erosion rates and cccl, FDEP and FL Sea Grant
Range monuments	r_mon_brev, r_mon_vol3	x	fdep beach	could possibly merge these two
Woodwind Windthrow Hazard	woodwnd	x	fgdl	see readme.txt in cvat/environ
Sea Level Rise Risk	usgs_volbrev_slr	x	USGS	
NWS Forecast Zones	nws	x	nws-csc	contain hyperlinks to zone forecasts
NWS Marine Forecast Zones	nws_volbrev_marineforecastz	x	nws	contain hyperlinks to zone forecasts
Evacuation Zones	evac_zones_volbrev	x	fdem	

Societal Analysis:	**File Name**	**In Hand**	**Source**	**Comments**
High Need Block Group	highneed_blkgrp	x	csc	high comp_soc intersect w/ high-mod composite
Land Use- Residential	lulc_res	x	sjrwmd	
Composite Societal Vuln. Scores	composite_societal	x	csc/cens	based on sum of scores; all-in-one layer
High Need Residential	modtohigh_res	x	csc	intersect of mod-high comp. and res. LU
Non-white Population	00_minority_pop	x	csc/cens	
Households Below Poverty	00_below_poverty	x	csc/cens	
Persons over Age 65	00_pop_ovr_65	x	csc/cens	
Single Parent with Child Families	00_single_wchild	x	csc/cens	
No High School Diploma	00_no_diploma	x	csc/cens	
Public Assistance Income	00_pub_assist	x	csc/cens	
Housing Rental	00_renter_occ	x	csc/cens	
No Vehicle Available	00_no_vehicle	x	csc/cens	

Critical Facilities Analysis:	**File Name**	**In Hand**	**Source**	**Comments**
Critical Facility Risk Area Scores			csc	crit_fac_updated displayed in 5 classes
Critical Facility (All Classes)	crit_fac_updated	x	-	
Fire and Rescue	cf_fr	x	fdem	
Police	cf_pol	x	fdem	
Communication	cf_comm	x	fdem	
Transportation	cf_tran	x	fdem	
Utilities	cf_util	x	fdem	
Government	cf_govt	x	fdem	
Shelter	cf_shlt	x	fdem	
School - Volusia and Brevard merge	cf_school_merge= #1+#2	x	brev, vol	A merge of brevard and volusia school layers
Volusia Schools - #1	schools; vol_schools	x	vol	from Volusia GIS page, then reprojected
Brevard Schools - #2	cf_sch_br	x	brev	
Hospital and Nursing Home	cf_hosp	x	fdem	
Daycare				
Animal Care	cf_anim	x	fdem	
Disaster Operations	cf_disops	x	fdem	
Disaster Services	cf_disser	x	fdem	
Hazardous Materials	cf_hazmat	x	fgdl	
Solid Waste / Landfill	cf_solw	x	fdem	
Pump Station				
Water Treatment Plant	cf_wtp	x	fdem	
Waste Water Treatment Plant	cf_wwtp	x	fdem	only for Brev, need Vol wwtp

*** for each critfac there is a sister layer (m_...), these layers have spatially joined composite.shp attributes**

Mitigation:	**File Name**	**In Hand**	**Source**	**Comments**
High Risk Undeveloped Land	highrisk_undevland	x	csc	
High Risk Undeveloped Zoning				***create**
Land Use- Undeveloped Land	elu_lw	x	sjrwmd	
County Zoning				
County Park	vol_parks_proj		vol	need Brev
CBRA Designation	cobra	x	csc	
Federal Land	fed_land2	x	natnl atlas	
NFIP Policies - volusia	nfip_policies_vol	x	vol	from vol geocd5
NFIP Policies - brevard	nfip_policies_brev	x	sjrwmd	they said to use sjrwmd
NFIP Repetitive Loss Claims	nfip_reploss_brev/vol	x	csc/fema	geocoded a fema file
NFIP Claims				
Percent Homes Built Before 1970	00_built_bef_70		census	
Percent Mobile Homes	00_mobile homes		census	
Coastal Construction Control Line	cccl_volbrev	x	fdep beach	

CSI - Volusia and Brevard Data Inventory - List of Acronyms

Acronym	Name
Brev	Brevard County Property Appraisers Office
BSB ElecCh	BSB Electronic Charts
Cens/Census	United States Census Bureau
CSC	National Oceanic and Atmospheric Administration Coastal Services Center
DCA	Florida Department of Community Affairs
EPA	United States Environmental Protection Agency
ESRI	Environmental Systems Research Institute
FDEM	Florida Division of Emergency Management
FDEP	Florida Department of Environmental Protection
FDEP Beach	Florida Department of Environmental Protection- Beaches and Coastal Systems
FEMA	Federal Emergency Management Agency
FGDL	Florida Geographic Data Library
FSG	Florida Sea Grant
FWC-OES	Florida Fish and Wildlife Conservation Commission
Natnl Atlas	United States Geological Survey National Atlas
NOAA SPO	National Oceanic and Atmospheric Administration Special Projects Office
NWS	National Oceanic and Atmospheric Administration National Weather Service
Prop Apprs	Brevard and Volusia County Property Appraisers Offices
SJRWMD	St. John's River Water Management District
USDA/NRCS	United States Department of Agriculture Natural Resources Conservation Service
USGS	United States Geological Survey National Atlas
Vol	Volusia County Government Geographic Information Services

Appendix 2

Census Data Downloading and Converting

Census 2000 SF3 data: Downloading and Converting

This document describes the process for downloading and converting U.S. Census Bureau 2000 Summary File 3 (SF3) data. The Census Bureau currently provides data via File Transfer Protocol (FTP) in the form of zip files (.zip).

The process of downloading the data and converting them into a GIS format may appear intimidating at first. This document attempts to clarify the process while educating the reader about Census data and their accompanying documentation. The process described below, although not tested in every state, is applicable to all states where Census SF3 data exist. This process applies to the block group summary level but is applicable up to the state and national levels. The reader should be familiar with GIS terminology and methodology. Specifically, the reader should understand the process of importing tabular data into a GIS.

Software requirements: Microsoft Access (2000 or 2002), Microsoft Excel, GIS software (such as Environmental Systems Research Institute's (ESRI) ArcView or ArcGIS)

Downloading Data from the Census Web site

1. Read the FTP README document located at *www2.census.gov/census_2000/datasets/Summary_File_3/0README_SF3.doc* to become familiar with file naming conventions, data records and segmentation, file record layout, and FTP file transfer. If you already know this information, there is no need to read the document.

2. Determine which data file you need from Figure 2.2, "File/Table Segmentation" in the 0README_SF3.doc.

   Determining which data file you need:
   The data file you need depends on which SF3 table you need. Your SF3 table is determined by the attributes it contains. There are many attributes in each SF3 table. Determine these attributes from the file 0SF3_table_matrix.doc (see Image 1) located in the same directory as the 0README_SF3.doc above. Finding the attributes you're looking for may be the hardest part of the process since there are so many to sort through. But this step is necessary so that you can query the correct information later.

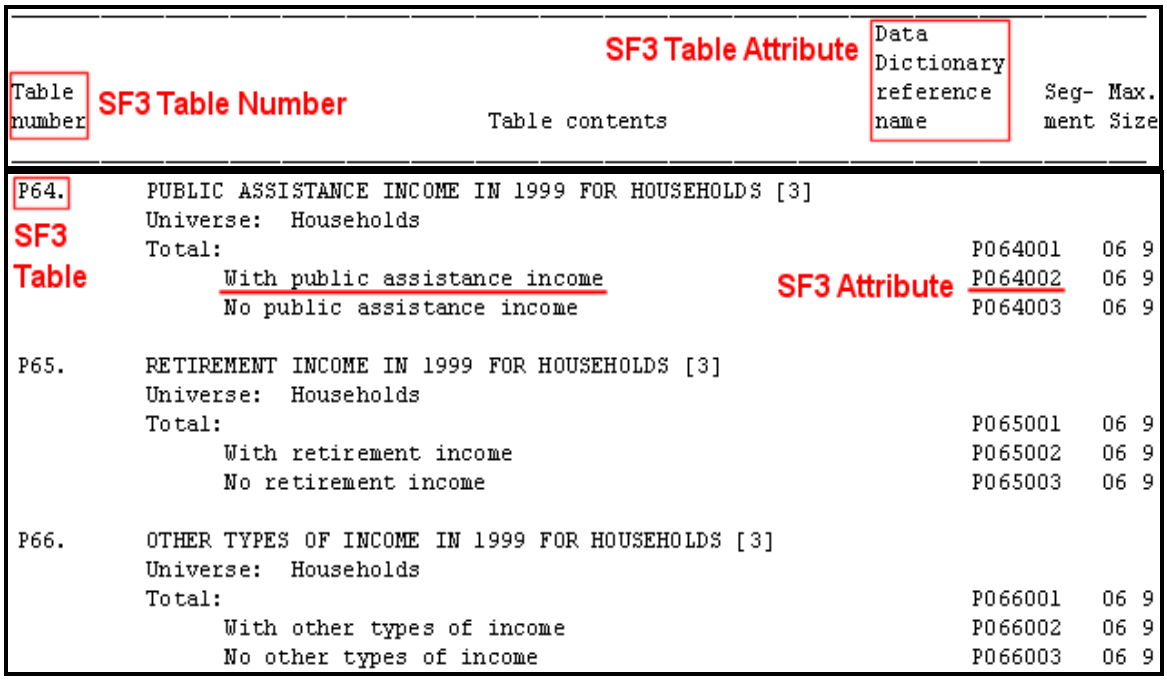


Image 1. The above image, taken from 0SF3_table_matrix.doc, is an example SF3 table attribute. It is P064002, which represents "Public Assistance Income in 1999 for Households" and is part of the P64 SF3 table.

In 0README_SF3.doc, scroll to "Figure 2.2 File/Table Segmentation" to see which zip files to download. Each zip file contains a .uf3 file, which is a file type used by the Census Bureau. A .uf3 file contains a range of SF3 tables and their attributes:

File Name *(CIFSN)*	*NUMBER OF DATA ITEMS*	*STARTING MATRIX NUMBER*	*ENDING MATRIX NUMBER*
*st*geo.uf3[1]			
*st*00001.uf3	248	P1	P14
*st*00002.uf3	218	P15	P24
*st*00003.uf3	241	P25	P37
*st*00004.uf3	227	P38	P46
*st*00005.uf3	220	P47	P50
*st*00006.uf3	250	P51	P67
*st*00007.uf3	213	P68	P01

Image 2. The above image, taken from 0README_SF3.doc, is an example range of SF3 tables within a .uf3 file. The zip file named *st*00006_uf3.zip (where *st* is the Federal Information Processing Standards (FIPS) code for your state) in your

state's folder will contain the *st*00006.uf3 file, which contains the SF3 tables P51 through P67. If you needed the SF3 tables P64 and P65, for example, you would download this .zip file.

Go into your state's folder and download the appropriate zip file based on which SF3 table you need.

3. From your state's folder, download the *st*geo_uf3.zip file.

   What is the *st*geo_uf3 file?

   The *st*geo.uf3 file is a file that contains all of the Census geographic information for a state, such as tracks, block groups, and blocks. It serves as the geographic component to which you join the demographic information you determined in step 2. It makes sure that the right geographic unit, such as a block group, has the right information associated with it. This file is required, regardless of which geographic unit you are using.

4. Unzip the files you downloaded, including the *st*geo_uf3.zip. Once unzipped, change the file type extension from .uf3 (census file type) to .txt. This step is important because it enables you to import the unzipped text data into Microsoft Access. Doing this does not corrupt the data.

   Note:

   - A .uf3 file is merely a Census Bureau text file. Since Microsoft Access does not recognize the .uf3 file extension, you have to change the file extension to .txt. The .txt file extension represents text files and is recognizable by Microsoft Access.
   - If you were to open the files in a text editor you would see comma delimited text with no field names. The data will be imported into a Census Access database template in step 6. In that step the data will be converted to a table and will acquire field names.

5. Open *www.census.gov/support/SF3ASCII.html* and scroll down to "Using Microsoft Access." Download and unzip the SF3 Microsoft Access (2000) database. This database serves as a template into which you import .uf3/.txt files.

Working in Microsoft Access

The Census import, establish relationships, and query directions are written for Access 2000. If you are using Access 2002, the Access 2000 directions are sufficient. Although named the same, some buttons are located in different places or are on a different graphical user interface (gui) within the same tool.

6. Open the SF3 Microsoft Access database. You will see several tables, SF30001 – SF30076. These tables correspond to the numbered zip files you determined and downloaded in step 2 (*st*000##_uf3.zip). They act as templates into which you import your text (.txt file extension) files. They give the .txt data the appropriate field names/headings. The Microsoft Access import process is described in the document located at *www.census.gov/support/SF3ASCII.html*. In this document, scroll to "Using Microsoft Access" and click on "Using Census 2000 ASCII text data files in Microsoft Access." Follow the procedure for "Importing text data files into Microsoft Access."

   An example of importing the text file into the SF3 template:
   - *st*00056.txt is imported into the SF30056 template
   - *st*00012.txt is imported into the SF30012 template

   Note:
   - Don't forget to import the geo header file (*st*geo.txt) into the SF3GEO template

7. Establish relationships (which is Microsoft Access lingo for join or relate) between files and query to extract the data (or SF3 table) you want. You can see how to do this in the same document that has the procedure for importing in step 6, located at *www.census.gov/support/SF1ASCII.html#Microsoft%20Access%20procedures*. Once on the Web page, see "Linking tables in Microsoft Access" and "Querying in Microsoft Access."

   Note:
   - When you query the *st*geo table, make sure you include the LOGRECNO, STATE, COUNTY, TRACT, and BLKGRP fields in the query output, see "Querying in Microsoft Access." These will be used to create the STFID field once you are using your GIS software. Creating the STFID field allows you to join to most block group shapefiles.
   - You can query the tables according to summary level (see Image 3). You want the summary level (sumlev) to be 150 if you are querying at the block group level. See page 4-1 in the technical documentation, located at *www.census.gov/prod/cen2000/doc/sf3.pdf*, for more information on summary levels. SF3 only goes to the block group level.
   - You can, at the same time, query according to county FIPS code to eliminate a step (extracting specific county data).
   - In all of your queries, make sure you carry over the LOGRECNO attribute of the queried records. Doing this will allow you to join the queried data to the appropriate block groups after you have completed step 9.

Field:	SUMLEV	Flgeo_LOGRECNO:	COUNTY	Fl00006_LOGRECN(	P064001
Table:	Flgeo	Flgeo	Flgeo	Fl00006	Fl00006
Sort:					
Show:	☑	☑	☑	☑	☑
Criteria:	"150"		"009" Or "127"		
or:					

Image 3. The above image is taken from the Access 2002 query design interface and shows the criteria for querying by summary level and county FIPS code. The FIPS codes 009 and 127 are for Brevard and Volusia Counties, FL respectively.

GIS Component

8. Export your ssgeo query and data query as a database file (.dbf) and open it in Microsoft Excel. You can also export the queries as an Excel spreadsheet (.xls) and convert them to .dbf once in Excel. The latter method can reduce your file size by half. Format your number columns correctly and save the database files.

9. Bring the table into your GIS Software along with a shapefile of block groups for your county or state. Most block group shapefiles have an STFID attribute. You need to create this attribute in the *st*geo table in order to link the block group shapefile and the *st*geo information. To do this, create the STFID field in the *st*geo table according to the block group shapefile's STFID field specifications. Calculate the values of this new field to equal "STATE + COUNTY + TRACT + BLKGRP." This gives you a value that can be linked to the shapefile's STFID field and associates the LOGRECNO attribute with the correct block groups. LOGRECNO now allows you to join the Census tables you exported from Microsoft Access to the block group shapefile.

Additional Notes:

- Block group shapefiles (and other Census 2000 geographies) are available from ESRI at *www.esri.com/data/download/census2000_tigerline/*.

- If ESRI doesn't have a shapefile of the block groups for your county or state, download the TIGER Cartographic Boundary Files from the Census Web site located at *www.census.gov/geo/www/cob/bdy_files.html*. Once you download and unzip the correct file, use ESRI's ArcToolbox (or Import71 for ArcView 3.x) to import the interchange file (.e00 file extension) into a coverage.

- Read Chapter 2 in the technical documentation, located at *www.census.gov/prod/cen2000/doc/sf3.pdf*, to get an overall picture of the whole data conversion process.

- When you have finished, you can check to see if you completed the conversion correctly by going to American FactFinder at *http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds_name=DEC_2000*

_SF3_U&_lang=en&_ts=72886476749. Enter in the appropriate information, such as geographic type, state, county, and tract and block group number, in the dropdown lists that appear. Choose the appropriate table and compare the resulting demographic numbers to your block group numbers.

For more information, contact
Billy Brooks, (843) 740-1319
William.Brooks@noaa.gov

Appendix 3

Usability and Needs Assessment Materials

Card Sort Exercise

Grouping the Web site sections. Please organize the cards in groups, then create a name for each of the groups.

Example:

Fruits (group1)	Vegetables (group 2)
strawberries	carrots
bananas	green beans
grapes	lettuce

List of terms that appear on the cards

Web site Home
Frequently Asked Questions
Community Rating System
Storm Surge Visualization
Parcel Analyzer
Societal Analysis
Risk and Vulnerability Assessment Overview
Risk and Vulnerability Assessment Interactive Maps
Links
Parcel Analysis Interactive Maps
Hazards Locator Interactive Maps
Data Links
Community Rating System Interactive Maps
Hazards Analysis
Critical Facilities Analysis
Economic Analysis
Environmental Analysis
Mitigation Opportunities
Glossary
Disclaimer

Draft-For Internal Use Only

NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

Site Search: Go

Home/

Risk and Vulnerability Assessment Tool

Using geographic information system (GIS) to analyze coastal hazard vulnerability to develop damage and loss reduction strategies

Section 1
Section 2
Section 3
Section 4
Section 5
Section 6

Mapping Hazards and Identifying Vulnerability

Use the Interactive Mapping module to:

- Perform analyses on spatial data to determine the locations of vulnerable people, property and natural resources
- Use analysis results to prioritize hazard mitigation measures
- View the status of the Community Rating System by municipality and county
- Analyze parcel data and information

Interested in Conducting a Risk and Vulnerability Assessment?

Our how-to guide outlines the process steps, provides examples, lists data sources, and contact information for performing a risk and vulnerability assessment.

The Coastal Storms Initiative project was piloted in Brevard and Volusia Counties, Florida, but is adaptable to other areas.

Not Sure What Hazards May Impact You?

Use the Hazards Locator to see if floods, hurricanes or erosion could impact your family.

Interested in Reducing Flood Risk and Insurance Premiums?

Find out how Community Rating System activities can reduce flood risk and increase flood protection.

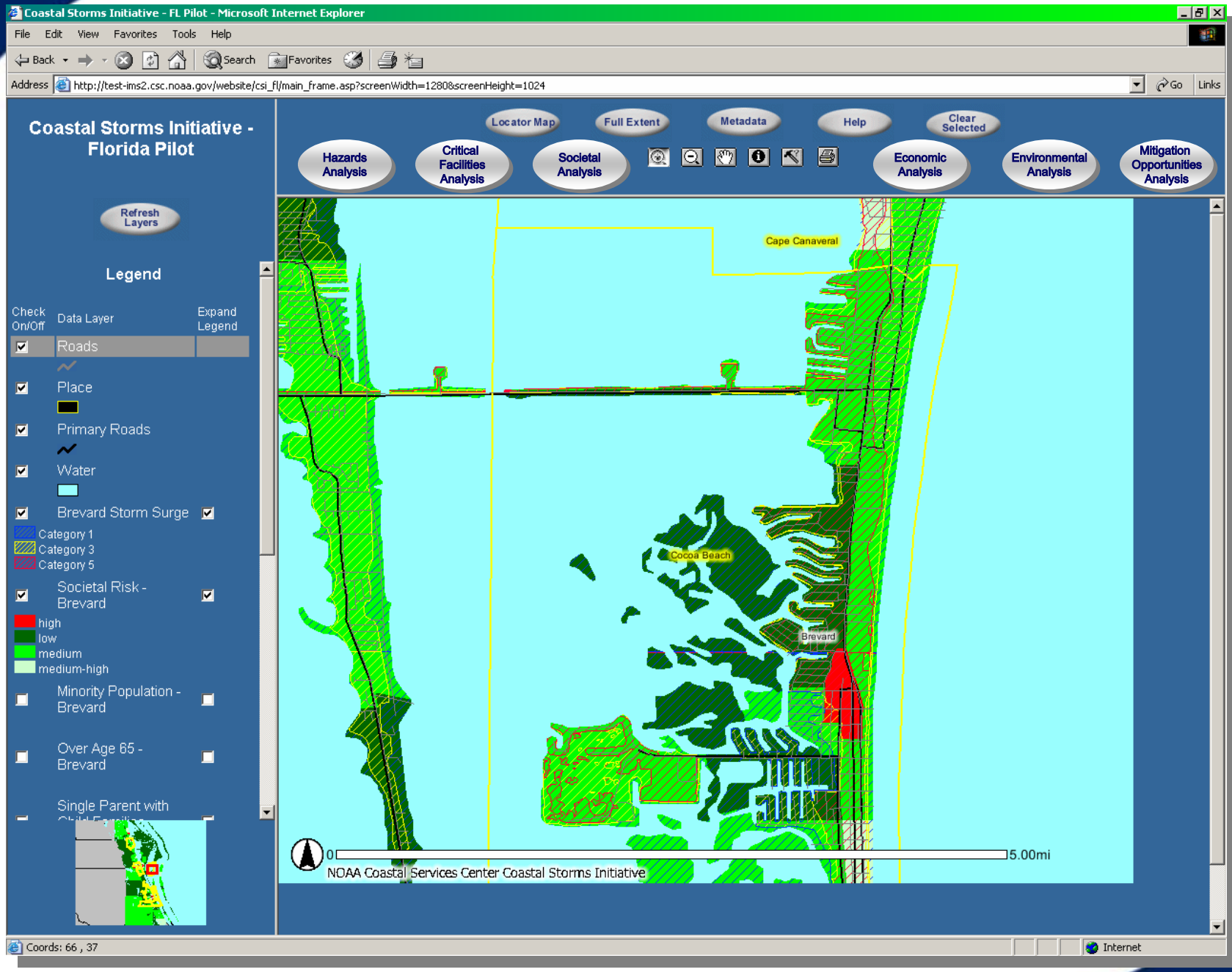
Print Version || Disclaimer

CIS-RVAT Web site Home Page

1. What catches your eye on the Web page? Please explain.

2. Based upon the current information on this Web page. . .
   a. What's the purpose of the site?

   b. What content would you expect to find on this Web site?


Coastal Storms Initiative - FL Pilot - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://test-ims2.csc.noaa.gov/website/csi_fl/main_frame.asp?screenWidth=1280&screenHeight=1024
Go Links
Coastal Storms Initiative - Florida Pilot
Refresh Layers
Legend
Check On/Off
Data Layer
Expand Legend
Roads
Place
Primary Roads
Water
Brevard Storm Surge
Category 1
Category 3
Category 5
Societal Risk - Brevard
high
low
medium
medium-high
Minority Population - Brevard
Over Age 65 - Brevard
Single Parent with
Locator Map
Full Extent
Metadata
Help
Clear Selected
Hazards Analysis
Critical Facilities Analysis
Societal Analysis
Economic Analysis
Environmental Analysis
Mitigation Opportunities Analysis
Cape Canaveral
Cocoa Beach
Brevard
0
5.00mi
NOAA Coastal Services Center Coastal Storms Initiative
Coords: 66 , 37
Internet

ArcIMS Questions

1. Are there any data layers that should be added to enhance the analyses currently available (i.e., Risk and Vulnerability Assessment, Locate Hazards)?

2. Would you like to be able to perform other analyses? If so, what data layers or information would be required?

3. Did you understand the mapping interface (i.e., how to interact with the map)?

4. In the legend area, did you understand how to turn data layers on/off?

5. Did you understand how to access the other map sections?

6. Did you understand how to interact with the map, (e.g., zooming in or out)?

7. Did you encounter any problems when using the interactive maps?

Appendix 4

Training and Outreach Materials

A New Safety Web Site for Brevard and Volusia Counties

Flooding, high winds, storm surge... are you at risk?

Find out using the Coastal Storms Initiative weather hazards Web site.

Locate

Using on-line maps, you can discover quickly and easily what weather hazards might threaten your area and determine your level of risk. The site also provides a link to your area's National Weather Service office so that you can check the current weather.

Learn

The site provides an "About Hazards" section that describes hazards common to eastern Florida—storm surge, flooding, wind, and erosion—and what safety precautions you can take to prepare for them.

Launch

To use the Web site's weather hazard locator tool,

1. Go to *www.csc.noaa.gov/rvat* and click on the Hazards Locator Tool link.
2. Choose Option 1 to locate hazards in your community.
3. Follow the instructions below the map.

To find out your risk, go to *www.csc.noaa.gov/rvat*

A New Safety Web Site for Brevard and Volusia Counties

What Can You Do on This Web Site?

- Check the vulnerability of your house or neighborhood to weather-related events
- Check for immediate weather threats
- Look up definitions of weather-related terms
- Learn how to prepare for weather hazards

Contact

For more information about this Web site, contact your county emergency management office at the information below.

Brevard County Emergency Management
1746 Cedar Street
Rockledge, Florida 32955
(321) 637-6670
www.embrevard.com

Volusia County Emergency Management
49 Keyton Drive
Daytona Beach, Florida 32124
(386) 254-1500
http://volusia.org/emergency/

The weather hazards Web site is part of the Coastal Storms Initiative, a nationwide effort led by the National Oceanic and Atmospheric Administration (NOAA) to lessen the impacts to coastal communities from storms.

Brought to you by the NOAA Coastal Services Center and the Brevard and Volusia County Emergency Management Offices.

Brevard County Emergency Management

News Release

Friday, January 30, 2004, 10 AM

The National Oceanic and Atmospheric Administration (NOAA) will soon unveil a new website that will allow Brevard County residents to arm themselves with detailed information they can use to protect their homes and businesses from natural hazards such as hurricanes.

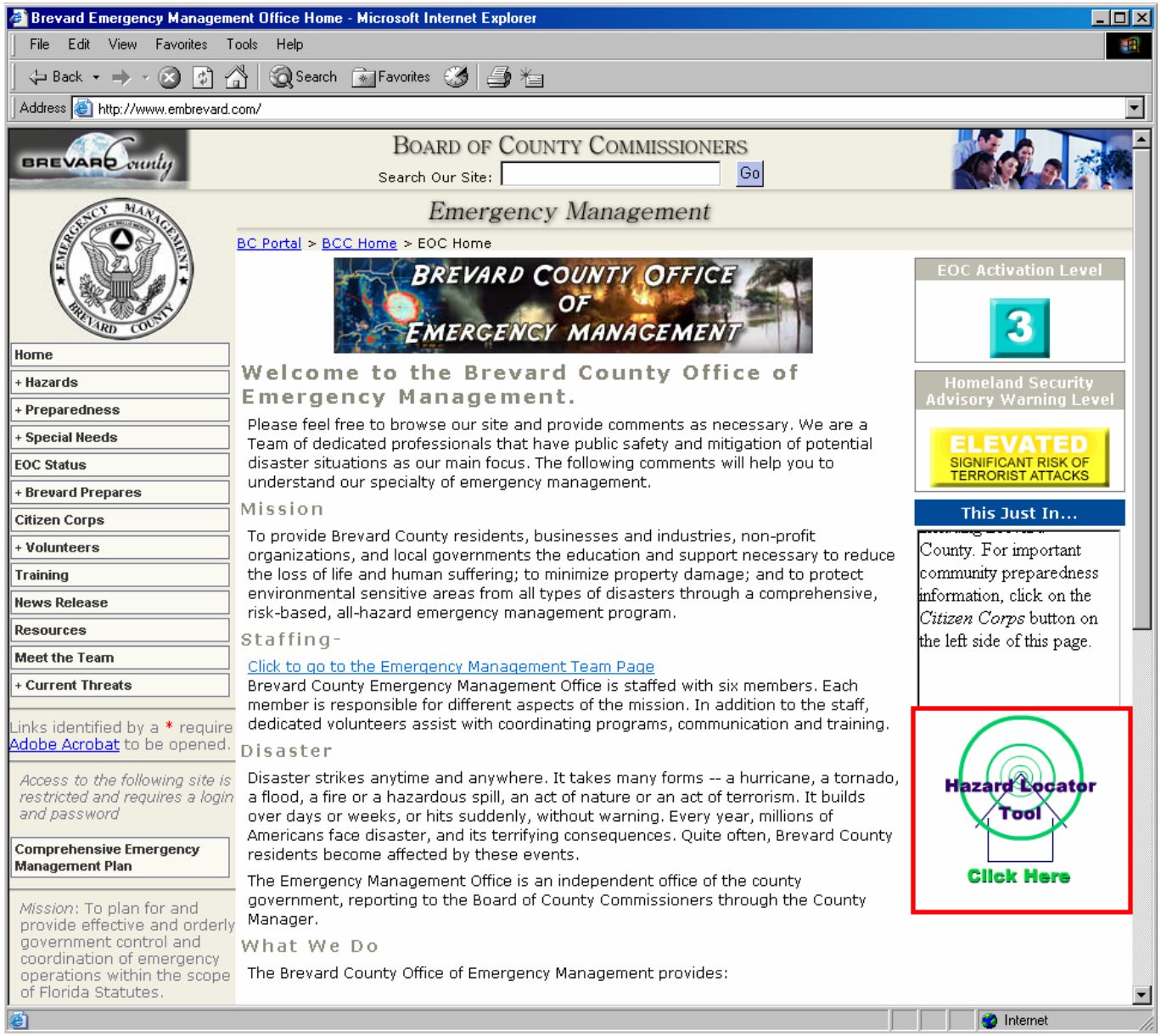
Brevard County is serving as a prototype for an on-going effort by NOAA to provide Americans with information more detailed than anything available in the past. When the site becomes operational next month, Brevard residents will be able to pinpoint their individual neighborhoods and evaluate their vulnerability to such weather hazards as storm surge, flooding, erosion and wind damage. The site will also outline steps residents can take to reduce their vulnerability.

Local government officials will get their first look at the site during a February training session. The training will be conducted by officials of NOAA's Coastal Service Center in Charleston, S.C.

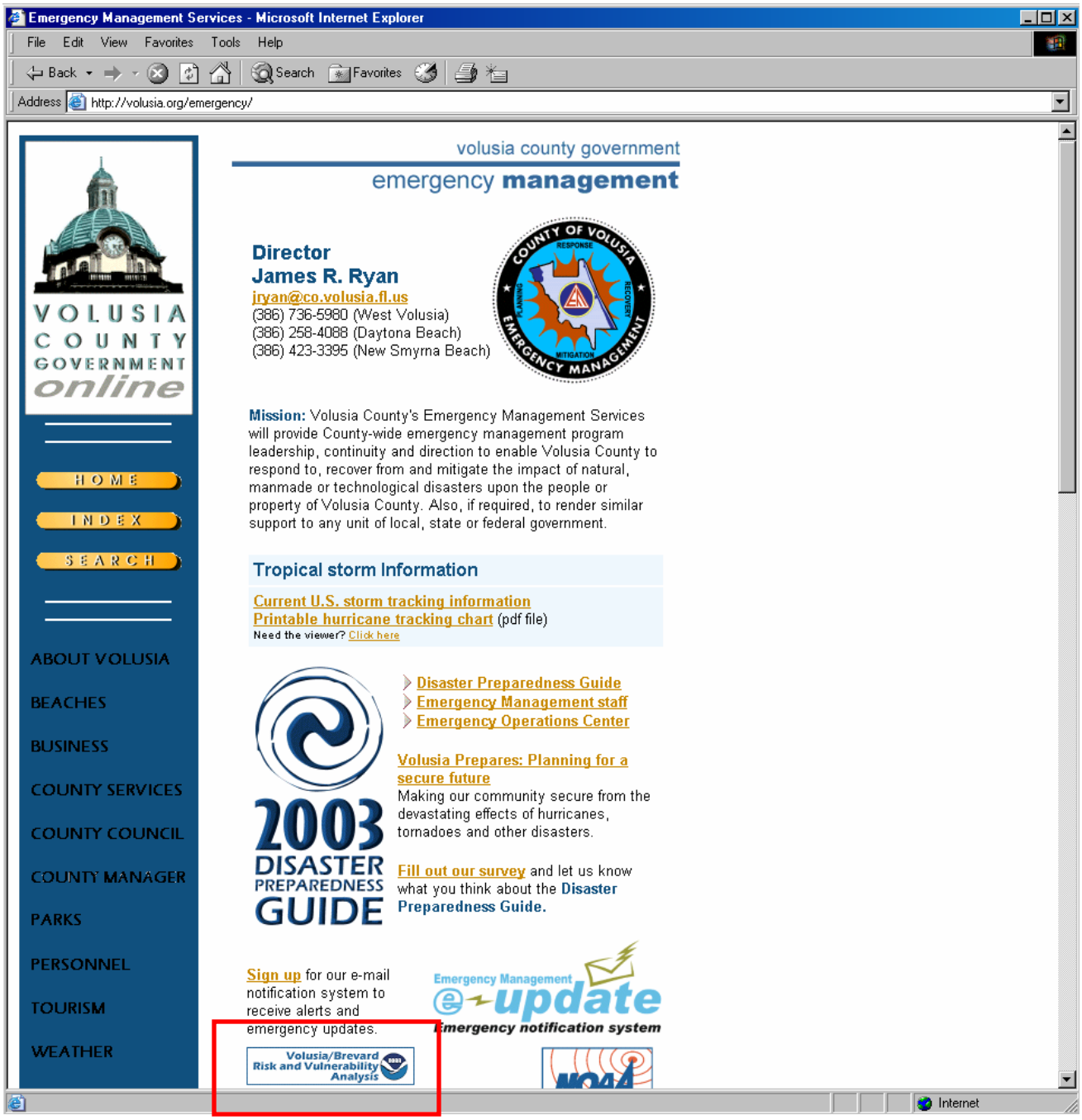
The training will be held at the Brevard County Emergency Operations Center (1746 Cedar Street, Rockledge) on Wednesday, February 11 from 10 a.m. – 1 p.m.

For further information, contact Mary Bolin at Brevard County Emergency Management by calling 321-637-6670.

Note: Journalists are welcome to attend the training. Lunch will be served and will include homemade chili, salad, cornbread and Joan Heller's killer brownies. Leave a message for Mary if you plan to attend.



Brevard County, Florida, Emergency Management Web site home page and link to the CSI Risk and Vulnerability Assessment Hazards Locator Tool



Volusia County, Florida, Emergency Management Web site home page and link to the CSI Risk and Vulnerability Assessment Tool

COASTAL SERVICES

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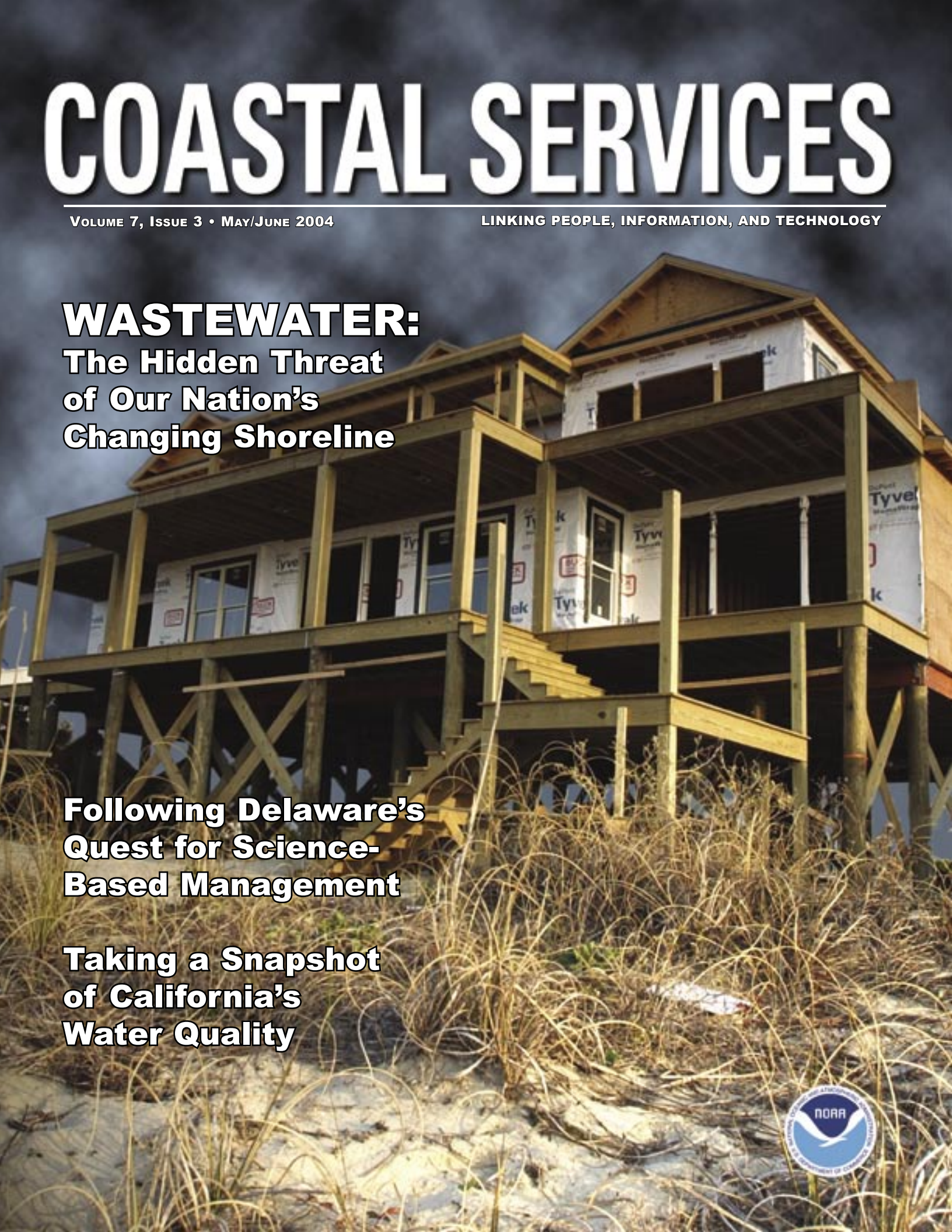
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY



WASTEWATER:
The Hidden Threat of Our Nation's Changing Shoreline

Following Delaware's Quest for Science-Based Management

Taking a Snapshot of California's Water Quality

News and Notes:

A New Hazards Outreach Tool Developed for Florida

Coastal governments must prepare for hazardous weather. But isn't this task equally important for individual community members?

Most coastal governments have emergency management departments that prepare communities for natural and man-made hazards. The National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center works with these emergency managers to identify risks and find ways to lessen the impacts of coastal storms and other hazards (see *www.csc.noaa.gov/vata/*).

A more challenging task is getting community members to make their own storm preparations. To address this issue, the Center partnered with emergency management offices in Florida's Brevard and Volusia Counties. They wanted to give citizens access to the same hazards-related information the professionals use so that families might become better informed and more prone to take action.

The team created a coastal hazards Web site located at *www.csc.noaa.gov/rvat/*. Visitors to the site can click on the "Hazards Locator Tool" link on the home page, enter an address in Brevard or Volusia County, and then watch as an on-line map zooms to that location and ranks its potential risk to four coastal hazards common to eastern Florida—storm surge, flooding, high winds, and erosion. This personalized information may entice the public to use the site and, once there, to take the information provided more seriously.

People can also use the site to find out how to protect themselves and their property from coastal storms. The site provides descriptions of different weather hazards, safety precautions people can take to prepare for them, and links to Web sites for more information. A link to the National Weather Service office allows users to check for current threats.

The Center recently unveiled the site to the project partners, and the response is enthusiastic. A brochure has been developed to promote the site, and emergency managers are sending this information to their constituents and using the promotional material whenever they interact with the public.

"This Web site is an important part of a national initiative to help coastal communities protect themselves from storms," says Russell Jackson, project lead from the NOAA Coastal Services Center. "We've found that the more site-specific we can make the data search, the more interest and action we get from the public. We hope they will use this information and join their community leaders as they try to protect themselves from coastal storms." ❖

Creating a Hazards Outreach Tool for Your Community

Most coastal programs with minimal geographic information system (GIS) experience can create a Web site that will allow community members to easily determine their coastal hazards vulnerabilities. Please visit *www.csc.noaa.gov/rvat/* and click on the hazards locator tool to see an example, or contact Russell Jackson at *Russell.Jackson@noaa.gov* should you have questions.

To create a site like this, you will need the following:

- **Spatial data layers—base maps, hazard layers, etc.**
- **List of potential partners and stakeholders**
- **Mitigation plan or the beginnings of one**
- **Hazards and information about them (i.e., coastal erosion studies, storm surge zones)**
- **GIS software**

NOAA Coastal Services Center
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(843) 740-1200
www.csc.noaa.gov
clearinghouse@noaa.gov

U.S. National Oceanic and Atmospheric Administration. Coastal Services Center. 2004. *Coastal Storms Initiative - Florida Pilot Risk and Vulnerability Assessment Tool Lessons Learned Report. NOAA Coastal Services Center.*