DIGITAL COAST

Partnerships…the best way to build the NSDI

Bill Burgess, Washington Liaison
National States Geographic Information Council

Digital Coast Website

Digital Coast Website

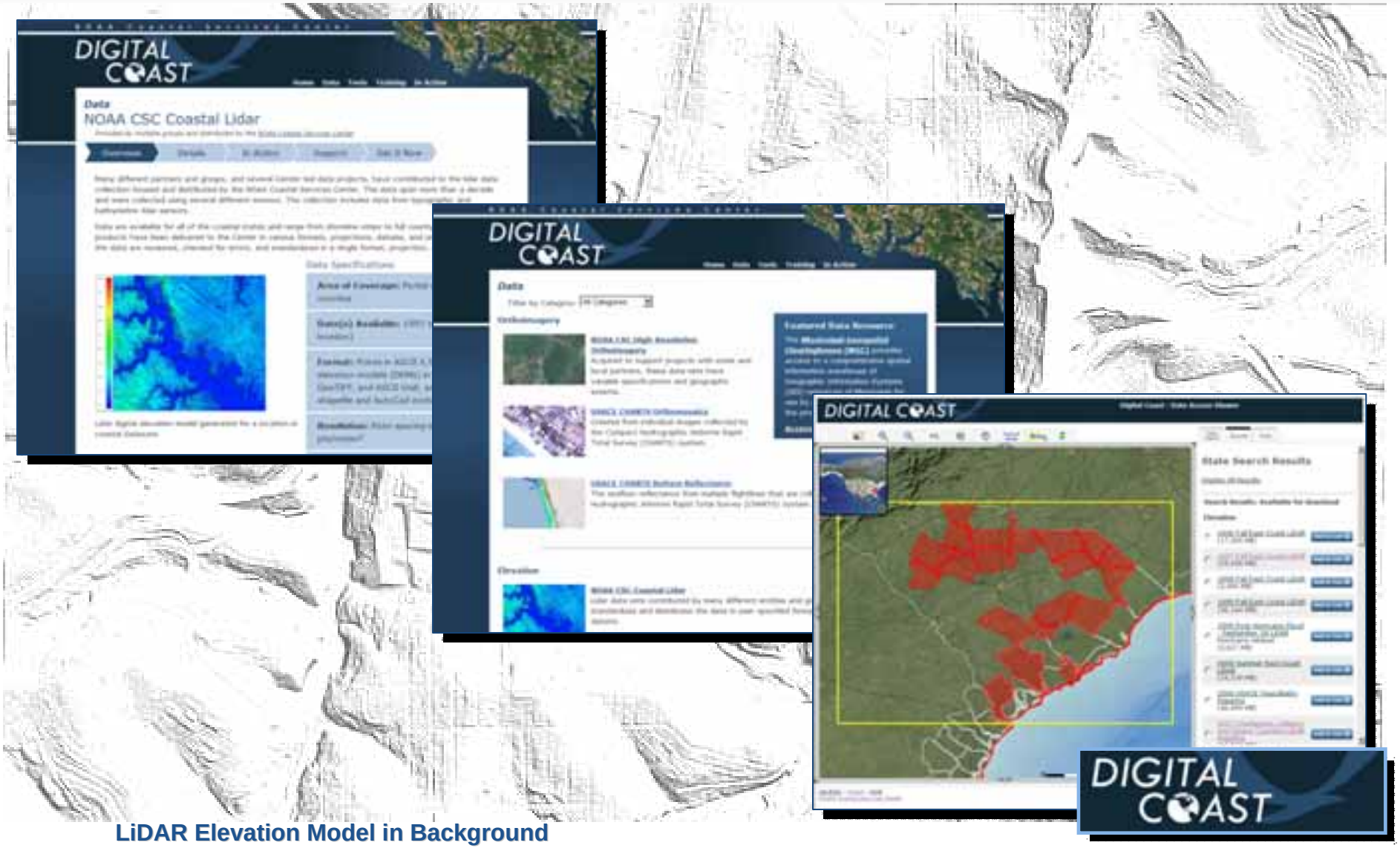
Digital Coast Components

- Data
- Tools
- Training
- "*In Action*" Profiles
- **Information that is used**

Vision

- Platform enables easy access to data, tools, and information
- Coastal organizations come together and use it to address coastal issues
- Evolves into a community managed resource over the long-term

Data



LiDAR Elevation Model in Background

Tools

NOAA Coastal Services Center

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Home Data Tools Training In Action

Tools

Analysis Tools

Use data to produce value-added results based on application.

Habitat Priority Planner
Helps to identify priority locations for conservation and restoration planning (extension to ArcGIS with Spatial Analyst)

Featured Tool
Multipurpose Marine Cadastre
Providing a framework for marine spatial planning efforts.

Nonpoint-Source Pollution and Erosion Comparison Tool
Examines land cover to measure runoff, nonpoint source pollution, and erosion (extension to ArcGIS with Spatial Analyst)

Impervious Surface Analysis Tool
Calculates the percentage of impervious surfaces for a selected geographic area (extension to ArcGIS with Spatial Analyst)

Sea Level Affecting Marshes Model
Simulates potential impacts of long-term sea level rise on wetlands and shorelines

Digital Shoreline Analysis System
Computes rate-of-change statistics from multiple historic shoreline positions

eCoastal Tools
Provides data management and analysis solutions for coastal engineering projects

Hazard Assessment Tool
Offers guidance on developing a website that addresses hazard-related data specific for your region

Benthic Terrain Modeler
Derives benthic terrain classifications from input bathymetry

Informational Tools

Provide guidance or 'how to' techniques.

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Tools

Multipurpose Marine Cadastre

Produced and distributed by the NOAA Coastal Services Center and the U.S. Minerals Management Service

This data viewer provides the baseline information needed for marine spatial planning efforts, particularly those that involve finding the best location for renewable energy projects. The Multipurpose Marine Cadastre (MMC) is also a helpful tool in the permit review process. Users pick the ocean geography of their choosing and quickly see the applicable jurisdictional boundaries, restricted areas, laws, critical habitat locations, and other important features. With the MMC, potential conflicts can be identified and avoided early in the planning process.

Features

Allows users to visually analyze and explore geospatial data for marine spatial planning activities

Provides direct access to authoritative marine cadastral data from federal and state sources

Tools

Multipurpose Marine Cadastre

Produced and

Overview

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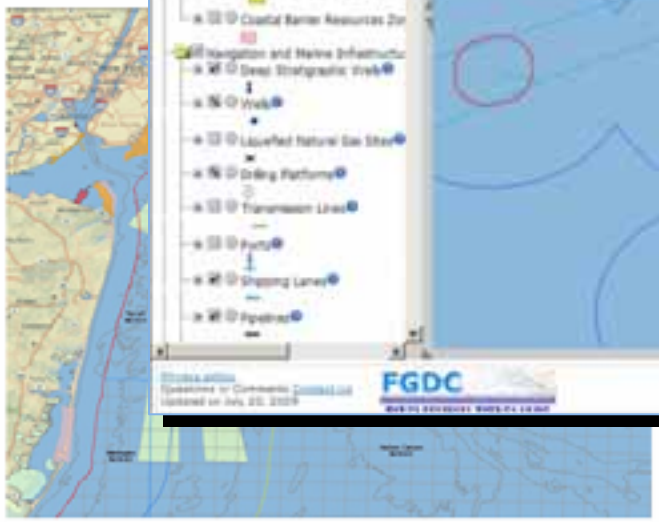

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Training


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Home Data Tools Training In Action
Training
Training provided by the NOAA Coastal Services Center is limited to c
from the nonprofit, local, state, and federal government sectors. Clas
Center's training facility in Charleston, South Carolina, or can be brou
Please review our remote training requirements (PDF) for host respons
requirements.
Technical
Assessing GIS for Your Organization
Coastal Applications Using ArcGIS
GIS for Managers
Habitat Priority Planner
Introduction to Coastal GIS
Remote Sensing for Spatial Analysts
Topical
Conservation Data Documentation
Coastal Inundation Mapping Course
GIS Tools for Strategic Conservation Planning
Road Map for Adapting to Coastal Risk
NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY
National
Contact Us Privacy Policy Link Disclaimer USA.gov
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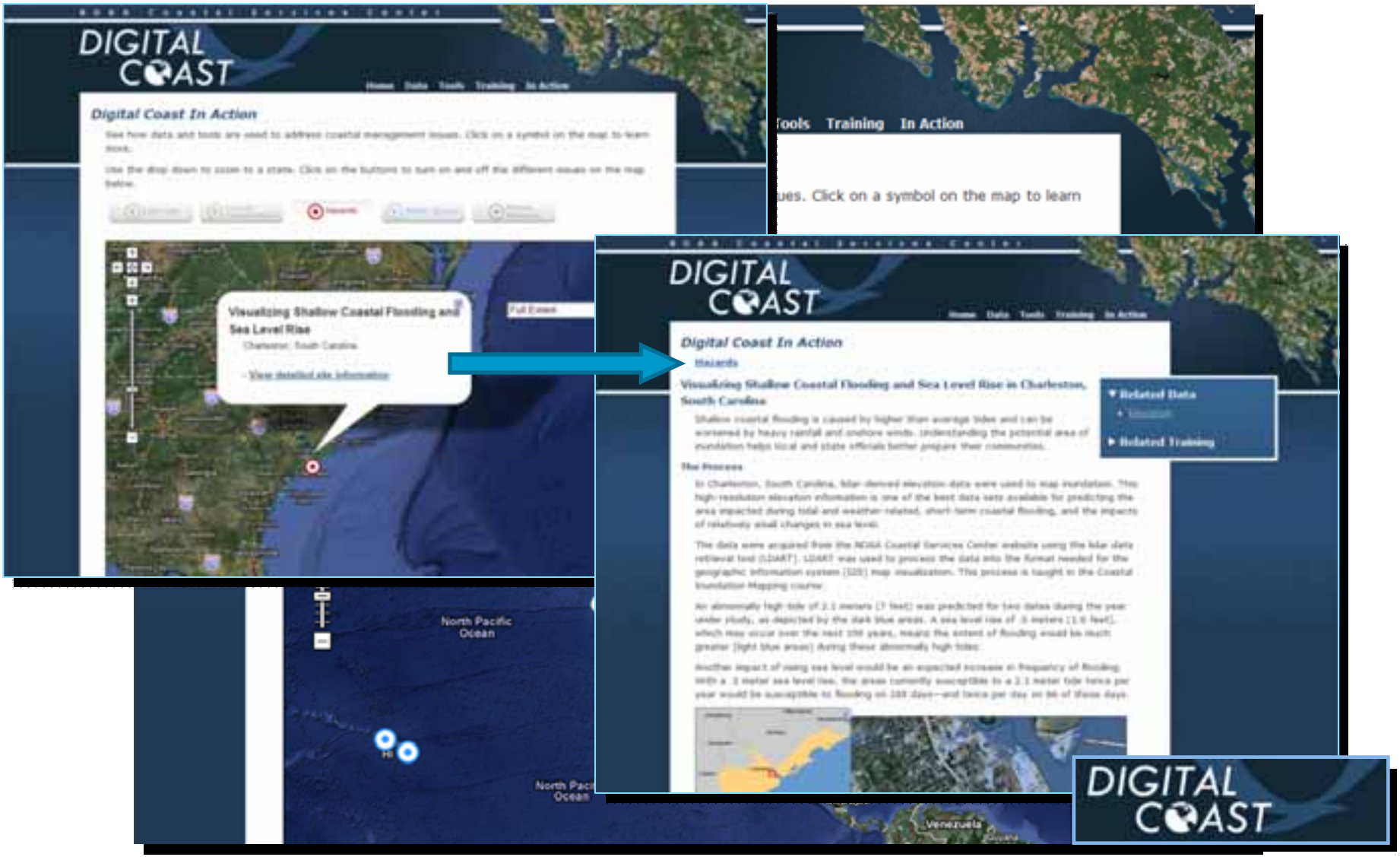
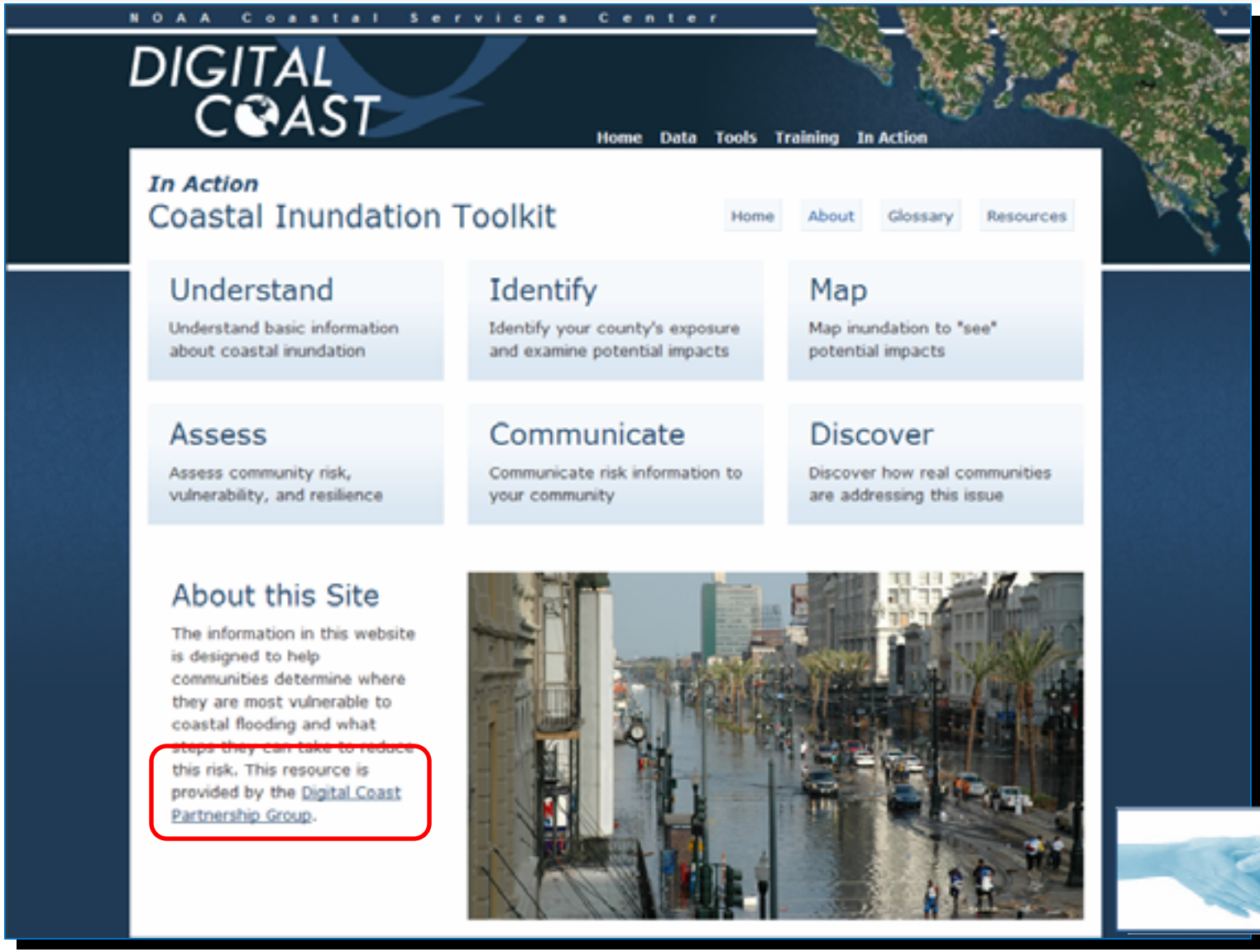
Digital Coast in Action

Digital Coast in Action



Digital Coast Partnership

Coastal Inundation Toolkit



In Action

Coastal Inundation Toolkit

Inundation and Coastal Communities

What Is Inundation? Water covering normally dry land is a condition known as inundation.

Inundation events are among the more frequent, costly, and deadly coastal hazards that can impact coastal communities in the U.S. In fact, riverine and coastal inundation causes the highest number of natural-hazard-related deaths. With coastal states supporting 81% of the U.S. population and generating 83% of U.S. gross domestic product, the potential for catastrophic loss from inundation events is greater in these states than in other areas of the country. Future inundation risks may be exacerbated by local changes in climate and sea level.

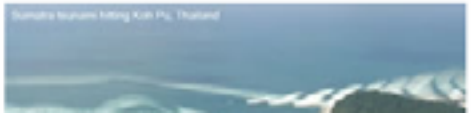
Learn More

Visit the **Glossary** to view the definition of inundation terms commonly used throughout this website.

Episodic Coastal Inundation Events

There are four primary causes of significant inundation: storm surge, tsunamis, inland flooding, and shallow coastal flooding.

Storm surge results from severe storms such as tropical cyclones (e.g., hurricanes, typhoons) and nor'easters, as strong winds combined with low pressure drive water onshore (NOAA, 2009). Hurricanes like Katrina (2005) and Hugo (1989), and the 1993 nor'easter (the "Storm of the Century"), caused extensive storm surge.



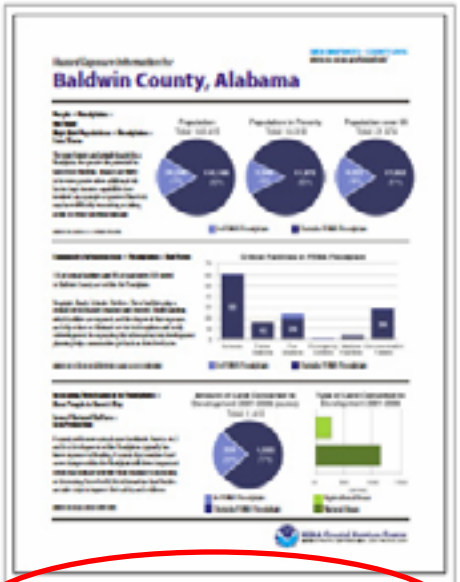
Tsunamis are large waves generated by an abrupt disturbance the sea surface (e.g., from an earthquake or landslide). A tsunar caused by a local event arrives minutes after generation, while a

In Action

Coastal Inundation Toolkit

Know What You're Dealing With

To make a community more resilient, one of the first steps is to identify the factors that contribute to a community's vulnerability. Listed below are five areas a community should investigate.



An example of a County Snapshot report available through the County Snapshots tool.

Identify Inundation Hazards. Identify what coastal inundation hazards may occur within your community and where they are located. Existing data, information, and resources can help in this identification. The geographic extent of the area of interest will help determine what data and resources are appropriate, and what questions can be answered.

Identify Community Strengths and Weaknesses. List what people, natural resources, businesses, and roads and other infrastructure are located in high-risk areas. Knowing what community assets are located in coastal inundation hazard areas helps prioritize where additional assessments should be conducted. The Mapping Socio-Economic Variables Using 2000 Census Data (PDF) methodology provides instructions on how to create socio-economic spatial data useful in an assessment. The Roadmap for Adapting to Coastal Risk training also explores data to use in an assessment.

Identify Risk Behaviors. Many factors influence how people act in the face of risk. People interpret these threats according to their experiences, emotions, and values, along with the information they receive. Identifying behavioral barriers and benefits is the first step in helping decision-makers understand people's risk behaviors, the best ways to communicate with them, and the methods to change these behaviors. To learn more about how to identify factors that impede individuals from taking risk-reducing actions, visit the Community Based Social Marketing website.

Identify and Visualize County Data. Seeing data visually displayed is often the best way to understand a

County Snapshots

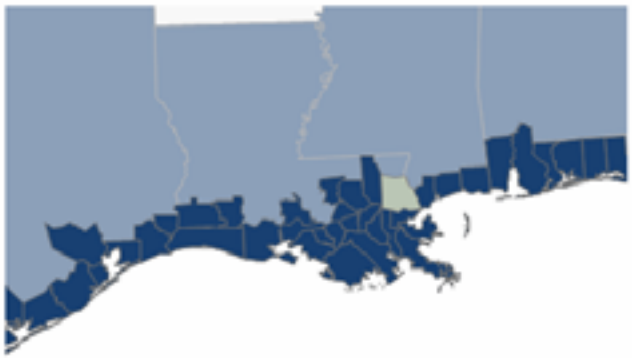
NOAA Coastal Services Center
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Search >>

Home | About | Data | Tools | Training | How-To Guides | Publications | Partnerships | Technical Assistance

County Snapshots: St. Tammany Parish, Louisiana

Download Full Report



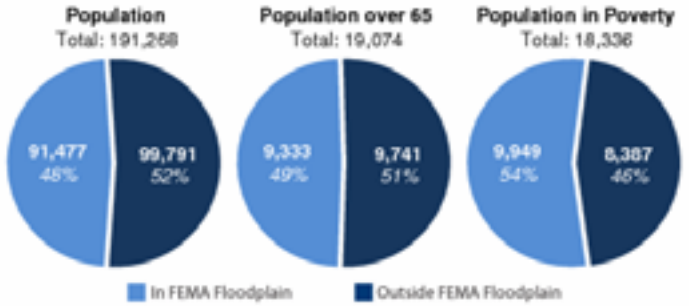
Click a county to view report.

Full Map

Louisiana | St. Tammany

Demographics | Infrastructure | Environment | About

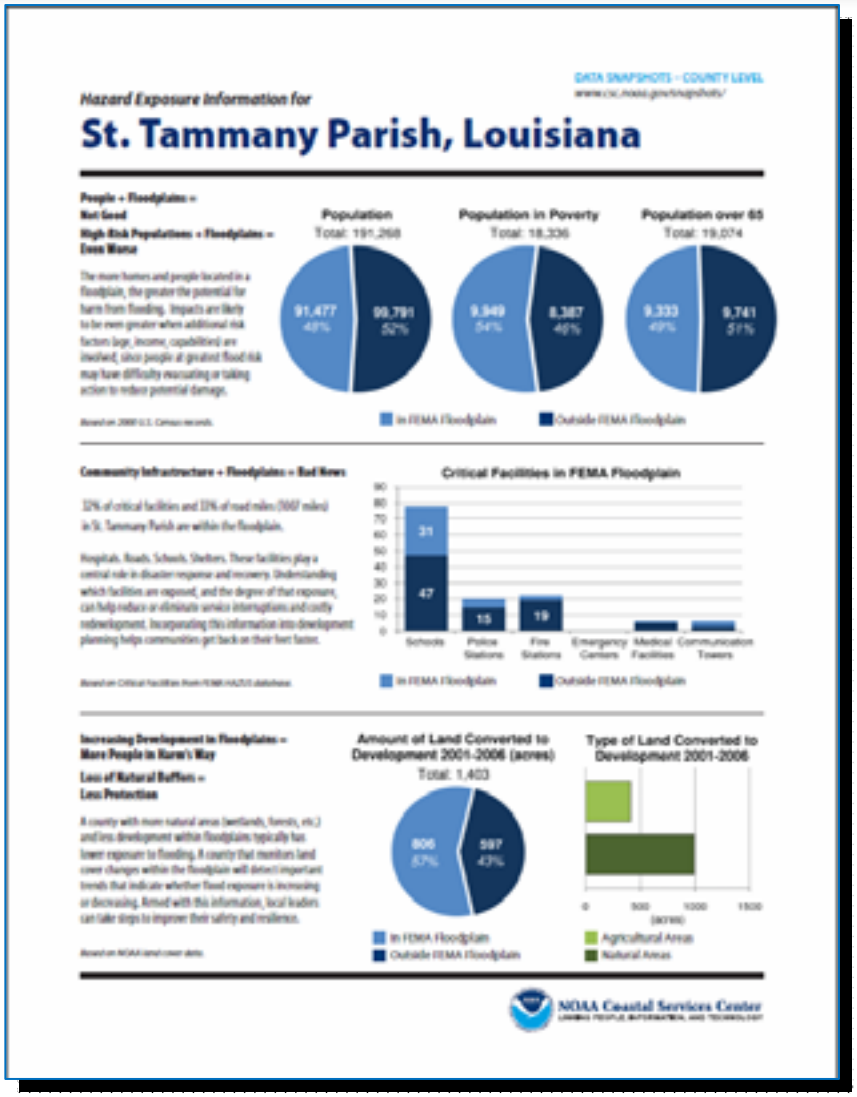
People + Floodplains = Not Good
High-Risk Populations + Floodplains = Even Worse



The more homes and people located in a floodplain, the greater the potential for harm from flooding. Impacts are likely to be even greater when additional risk factors (age, income, capabilities) are involved, since people at greatest flood risk may have difficulty evacuating or taking action to reduce potential damage.

Based on 2000 U.S. Census records.

County Snapshots



DATA SNAPSHOTS – COUNTY LEVEL
www.csc.noaa.gov/snapshots/

Hazard Exposure Information for

St. Tammany Parish, Louisiana

People + Floodplains = Not Good
High-Risk Populations + Floodplains = Even Worse

The more homes and people located in a floodplain, the greater the potential for harm from flooding. Impacts are likely to be even greater when additional risk factors (age, income, capabilities) are involved, since people at greatest flood risk may have difficulty evacuating or taking action to reduce potential damage.

Based on 2000 U.S. Census records.

Population
Total: 191,268
91,477 (48%) | 99,791 (52%)

Population in Poverty
Total: 18,336
9,949 (54%) | 8,387 (46%)

Population over 65
Total: 19,074
9,333 (49%) | 9,741 (51%)

In FEMA Floodplain | Outside FEMA Floodplain

Community Infrastructure + Floodplains = Bad News

32% of critical facilities and 33% of road miles (1007 miles) in St. Tammany Parish are within the floodplain.

Hospitals, Roads, Schools, Shelters. These facilities play a central role in disaster response and recovery. Understanding which facilities are exposed, and the degree of that exposure, can help reduce or eliminate service interruptions and costly redevelopment. Incorporating this information into development planning helps communities get back on their feet faster.

Based on Critical Facilities from FEMA HAZUS database.

Critical Facilities in FEMA Floodplain

Increasing Development in Floodplains = More People in Harm's Way
Loss of Natural Buffers = Less Protection

A county with more natural areas (wetlands, forests, etc.) and less development within floodplains typically has lower exposure to flooding. A county that monitors land cover changes within the floodplain will detect important trends that indicate whether flood exposure is increasing or decreasing. Armed with this information, local leaders can take steps to improve their safety and resilience.

Based on NOAA land cover data.

Amount of Land Converted to Development 2001-2006 (acres)
Total: 1,403
806 (57%) | 597 (43%)

In FEMA Floodplain
Outside FEMA Floodplain

Type of Land Converted to Development 2001-2006

NOAA Coastal Services Center

Next Steps

Through adaptation planning, all communities can be better prepared to face coastal hazards. While each community is different, there are some basic steps that all communities can follow to become more resilient.

Training that will lead your organization through this task can be brought to your office. Visit the Roadmap for Adapting to Coastal Risk Training (www.csc.noaa.gov/training/roadmap.html) to learn more. Many of the components of this course (which are outlined below) can be found within the Digital Coast's Coastal Inundation Toolkit (www.csc.noaa.gov/inundation).

1. **Know your risks** – If your county has a hazard mitigation plan, get a copy of it from your county emergency management office or the Federal Emergency Management Agency (FEMA) (www.fema.gov/plan/mitplanning/status.shtml?). Having county information about potential hazards, vulnerabilities, and priority hazard mitigation projects is important.

2. **Develop a team** – To see the issues and opportunities from as many perspectives as possible, engaging a diverse group of stakeholders is always a good idea. The County Snapshots (**www.csc.noaa.gov/snapshots**) are used to help people visualize the issues.

3. **Know what resources are available** – Federal and state agencies have funds available for risk reduction activities. See the funding opportunities listed below to learn more. There are also data and tools available to help people visualize the issues and solutions. For information on creating inundation maps for your community, visit the map section of the Coastal Inundation Toolkit. (www.csc.noaa.gov/inundation/mapt).

4. **Discover what others are doing** – See how other communities are addressing these issues. Visit the discover section of the Coastal Inundation Toolkit. (www.csc.noaa.gov/inundation/discover). You may also contribute a story about your community efforts.

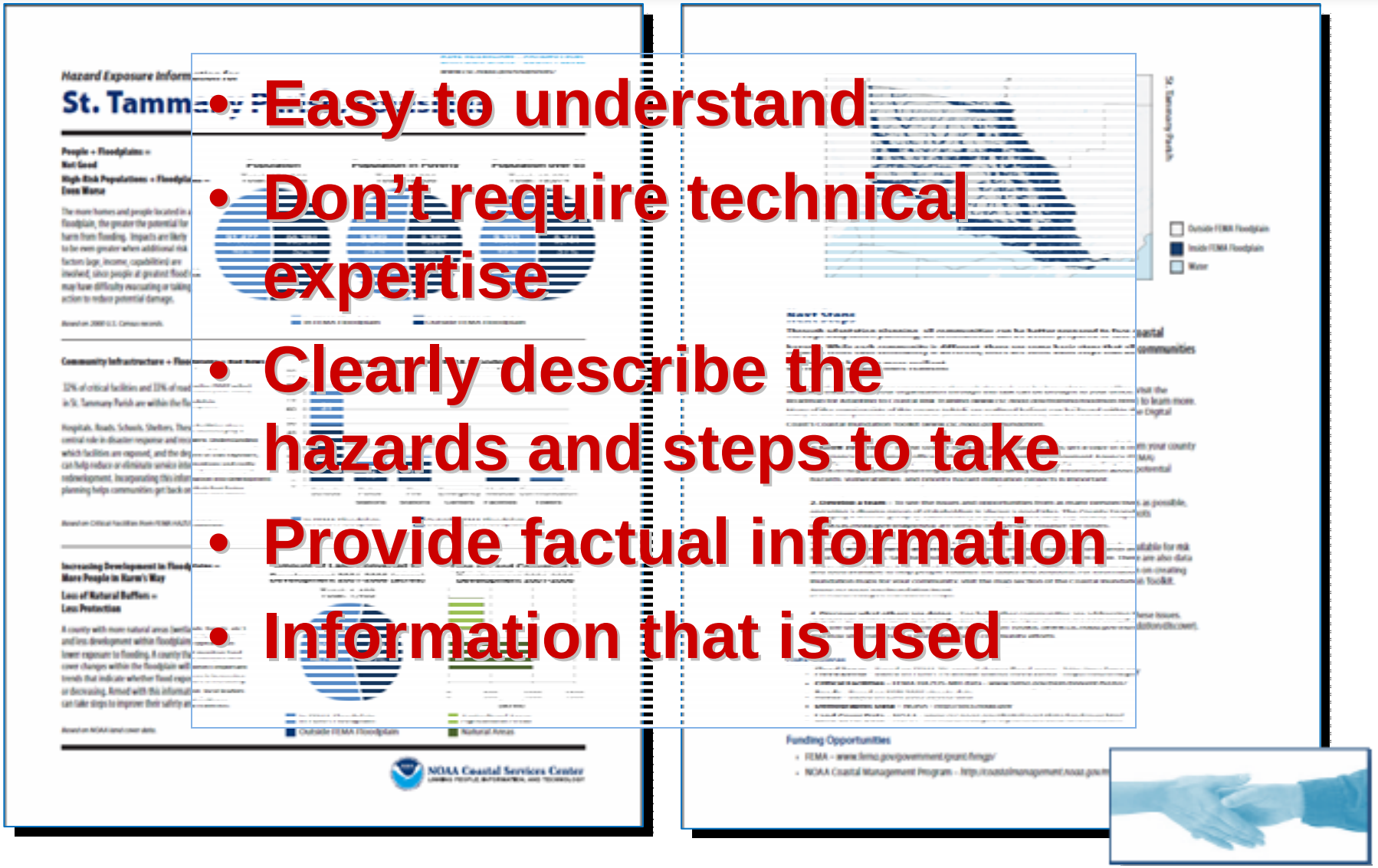
Data Sources

- **Flood Zones** – Based on FEMA 1% annual chance flood zones - http://msc.fema.gov
- **Critical Facilities** – FEMA HAZUS-MH data - www.fema.gov/plan/prevent/hazus/
- **Roads** – Based on ESRI 2005 streets data
- **Demographic Data** – NOAA - http://stics.noaa.gov
- **Land Cover Data** – NOAA - www.csc.noaa.gov/digitalcoast/data/landcover/html

Funding Opportunities

- FEMA – www.fema.gov/government/grant/fmgp/
- NOAA Coastal Management Program – http://coastalmanagement.noaa.gov/m

County Snapshots



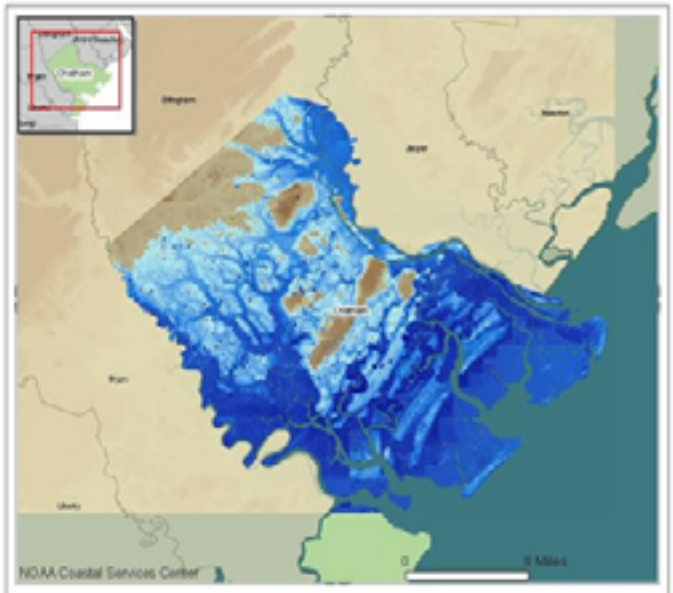
- Easy to understand
- Don't require technical expertise
- Clearly describe the hazards and steps to take
- Provide factual information
- Information that is used

In Action

Coastal Inundation Toolkit

Mapping Inundation

Why map inundation? These maps depict where inundation is likely to occur, how deep the water may get, and likely causes. While the County Snapshots provide a quick look at county risk data, making a local-scale inundation map allows coastal managers to use other data sets to create a detailed picture of community resources that may be exposed or vulnerable to inundation events.



Hurricane category 4 storm surge flooding for Chatham County, Georgia.

Inundation Mapping – A Four-Step Process

Inundation mapping can be viewed as a four-step process. Outlined below is a framework to create inundation maps, with each step explained in detail in the Coastal Inundation Mapping Guidebook (PDF). The guidebook discusses the mapping process and some of the limitations, such as how the resolution of the data will drive the scale of the planning, and explains why the accuracy of the data needs to be known and communicated to the users.

Obtain and Prepare Elevation Data

Elevation data (including nearshore bathymetry) serve as the base data layer for mapping coastal inundat

Before using elevation data for inundation mapping, it is important to understand requirements and

In Action

Coastal Inundation Toolkit

Developing Assessments

Once a community has identified inundation risks, it is important to bring in other stakeholders and decision makers to undergo a coherent risk assessment and planning process to identify community strengths and weaknesses, identify resources, and prioritize actions to lessen impacts.

Learn More

Building Coastal Resilience in Long Island, New York

Getting started in an assessment

Consider the following information.

- **Use maps and visualizations to inform adaptation planning.** Products like County Snapshots, which show data to characterize a county's demographics, infrastructure, and environment within the flood zone, and inundation maps provide important information on where coastal inundation risks are located and what is vulnerable to these risks. Learn how to create inundation maps for your community in the Map section.

Inland flood in the Tar River Basin in North Carolina a Hurricane Floyd in 1999.

- **Engage multidisciplinary stakeholders in the process.** Engaging a diverse group of people in coastal inundation risk assessment planning is critical and will provide valuable knowledge, experience, and resources in the decision-making process. A wide range of stakeholders and decision makers should be included in the process, from local floodplain managers and local government officials to state coastal resource managers and area business and community leaders. The Introduction to Stakeholder Participation publication discusses some of the most important considerations and offers a guide to the most

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Coastal Inundation Toolkit

Risk Communication

Effective risk communication involves delivering credible, clear, and meaningful messages to specific audiences in ways that work for them. A person's perception of inundation risk is much more complex than simply understanding the probabilities. Even an accurate perception of risk does not guarantee that people will take the appropriate action. One way to help guide people to taking action is by using community-based social marketing (PDF), which focuses specifically on changing peoples' behaviors using a variety of communications and other tools.

Risk Communication Basics

Effective risk communication requires careful analysis of the audience and planning of the message, as demonstrated below in these key concepts.

- **Understand the situation** – Realize that information alone generally doesn't change behaviors, and that peoples' experiences, emotions, values, and personal circumstances play a major role in making decisions.
- **Know your audience** – Identifying your specific target audience is important. Both qualitative and quantitative research can be helpful to understand how the target audience understands the hazard and how the message will be received. Two publications—Introduction to Stakeholder Participation and Introduction to Survey Design and

A simulation of sea level rise using CanVis visualizat software.

In Action

Coastal Inundation Toolkit

Moving Forward

You have the tools and the information. But adaptation planning for inundation still isn't easy. Seeing how other communities are addressing this issue can be very helpful. Below are a series of case studies that may generate some ideas of how a community can address inundation risks.

Examples

Building Coastal Resilience in Long Island, New York. The Nature Conservancy and partners are participating in an effort to give local decision makers the tools and information needed to examine alternative future scenarios that address sea level rise, storm surge, community vulnerability, and conservation priorities.

Lidar Lessons Learned: A Delaware Story (PDF). Not all elevation data are created equal. Before obtaining lidar data for use in inundation mapping, review the Delaware Coastal Management Program's lessons learned in contracting a lidar collection.

Assessing Coastal Vulnerability and Ecological Resilience to Sea Level Rise in Southern New England. Assessing a coastal system's vulnerability and resilience is critical for adaptation planning. Learn about The Nature Conservancy's exploration of the limitations and opportunities for regional-scale mapping of projected sea level rise.

View works cited and additional resources for discovering inundation.

Learn More

Learn what others are doing, share strategies and get basic information on climate change adaptation.

Contribute a Story

To share a successful example of how a community, state, or region is addressing coastal inundation, or to provide other information that may be useful to users of this website, please contact **Digital.Coast@noaa.gov**.

How CSC Works

- Works to understand the user community through conferences and surveys
- Seeks input by establishing good working relationships with diverse non-profit organizations and the private sector
- Contracts with these organizations to obtain focused input and work products that relate to the mission
  - Therefore, the products being produced are more likely to meet the business requirements of user community

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How CSC Works

- Doesn’t “dictate” to its partners
- Provides dedicated staff resources to work directly with and assist its partners
- Staff take an active role in project management to ensure schedules are met
- Holds regular meetings and follows-up on action items
- Takes action on partner input

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What's Different?

- Partnership - not a FACA or other type of committee
- Bottom-up approach - managed at the top
- Solutions created by the affected community
- No burden to participate
  - They respect the time commitment and the limited resources available within organizations
- Rapid implementation – words become action
- Work with other Federal agencies to integrate efforts

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Questions & Discussion

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