



Coastal Change Analysis

**Monitoring Changes in the
Nation's Coasts**

Nate Herold

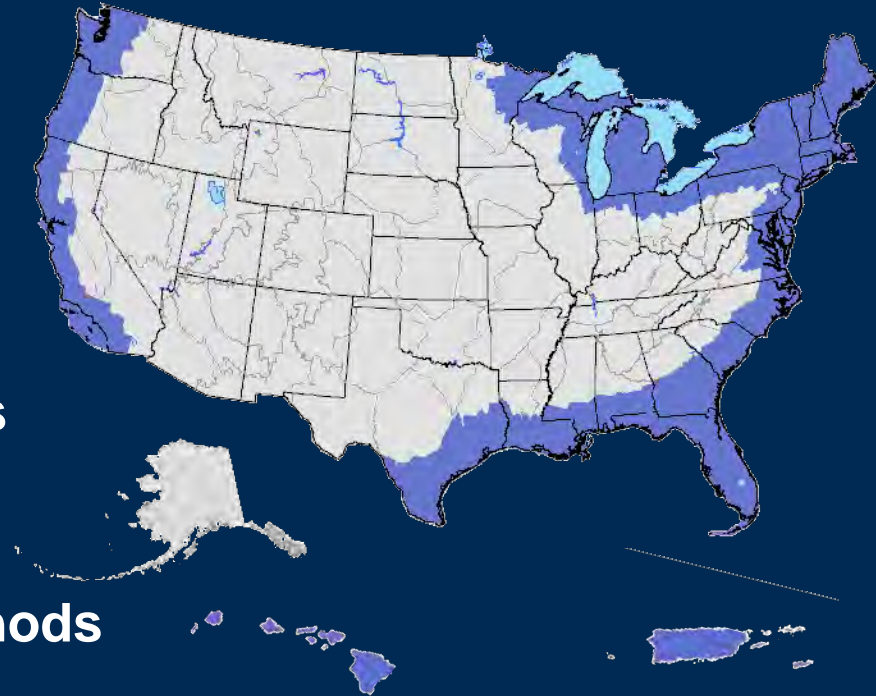
Presentation to the
Wetlands 2008 Conference
September 16, 2008

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The Coastal Change Analysis Program

- National coastal land cover and change mapping program
- Inventory of intertidal areas, wetlands, and adjacent upland, produced/updated every 5 years
- Consistent, accurate products through standard data and methods
- Coastal Expression of the National Land Cover Database (NLCD)



“Designed to help improve understanding of linkages between land change and the environment”

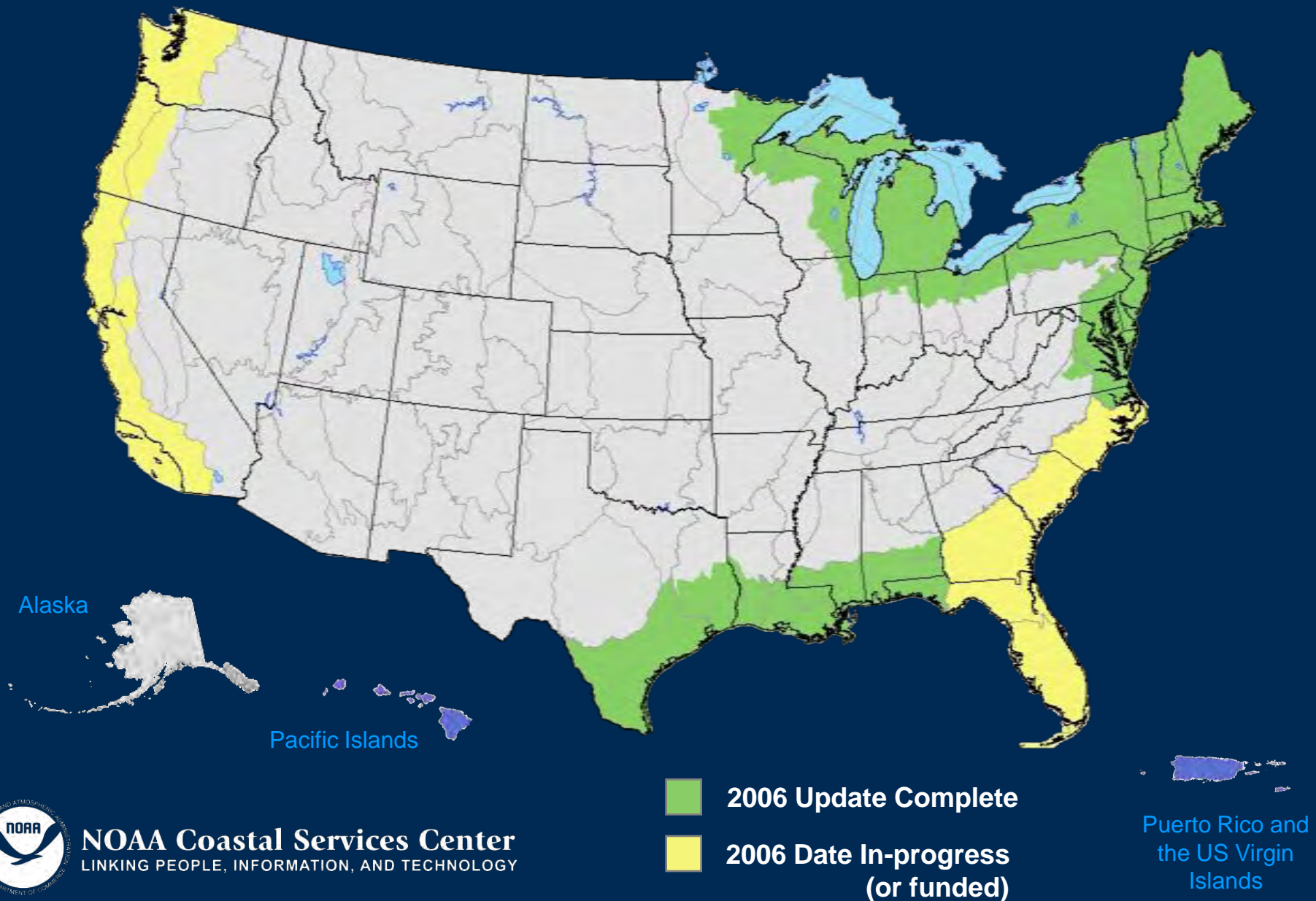


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We've Got You Covered...



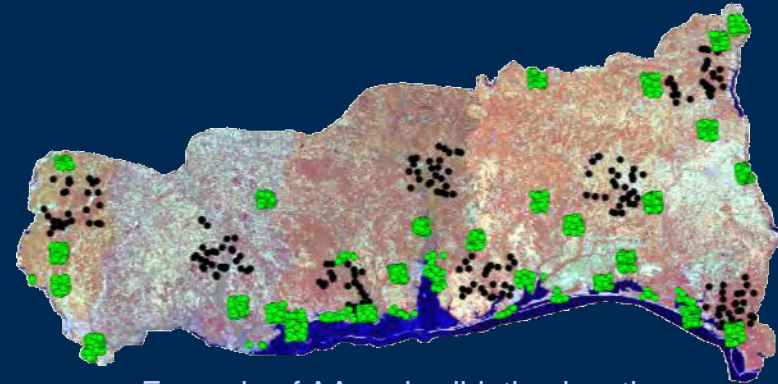
...and Covered.



Accuracy of C-CAP Product

Results of 2001 Mapping

- Over 2.3 Billion pixels served
 - Approximately 817,500 mi² mapped per date
- Over 20,000 AA points collected through 11 efforts
- Over 2100 validation points through 9 efforts



Example of AA and validation locations
In Gulf Coast Mapping Zone 46

Overall Accuracy was assessed at 86.3 %

Range of individual assessment were from 76-91%

Validation confirmed a range of 77-90%



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Coastal Land Cover Classes

Developed

- Developed, High Intensity
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, Open Space

Agricultural

- Cultivated Crops
- Pasture/Hay

Rangeland

- Grassland/Herbaceous
- Scrub / Shrub

Forest Land

- Deciduous Forest
- Evergreen Forest
- Mixed Forest

Barren Land

- Barren Land
- Unconsolidated Shore

Water

- Open Water
- Palustrine Aquatic Bed
- Estuarine Aquatic Bed

Wetlands

Woody Wetlands

- Palustrine Forested Wetland
- Palustrine Scrub/Shrub Wetland
- Estuarine Forested Wetland
- Estuarine Scrub/Shrub Wetland

Herbaceous Wetlands

- Palustrine Emergent Wetland
- Estuarine Emergent Wetland

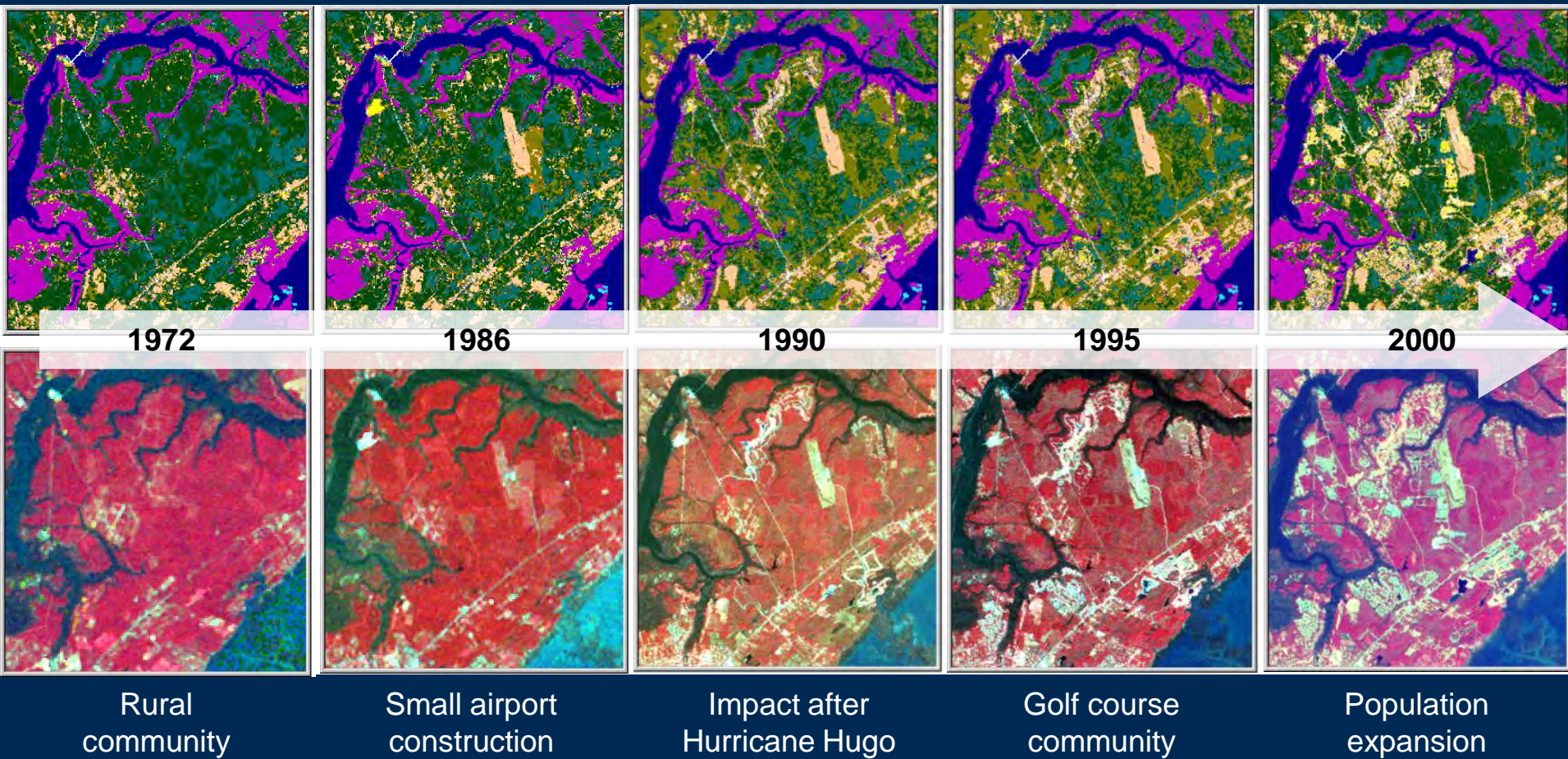
Perennial Ice/Snow

Alaska Only Classes*

- Dwarf Scrub
- Sedge/Herbaceous
- Lichens
- Moss

C-CAP Vision

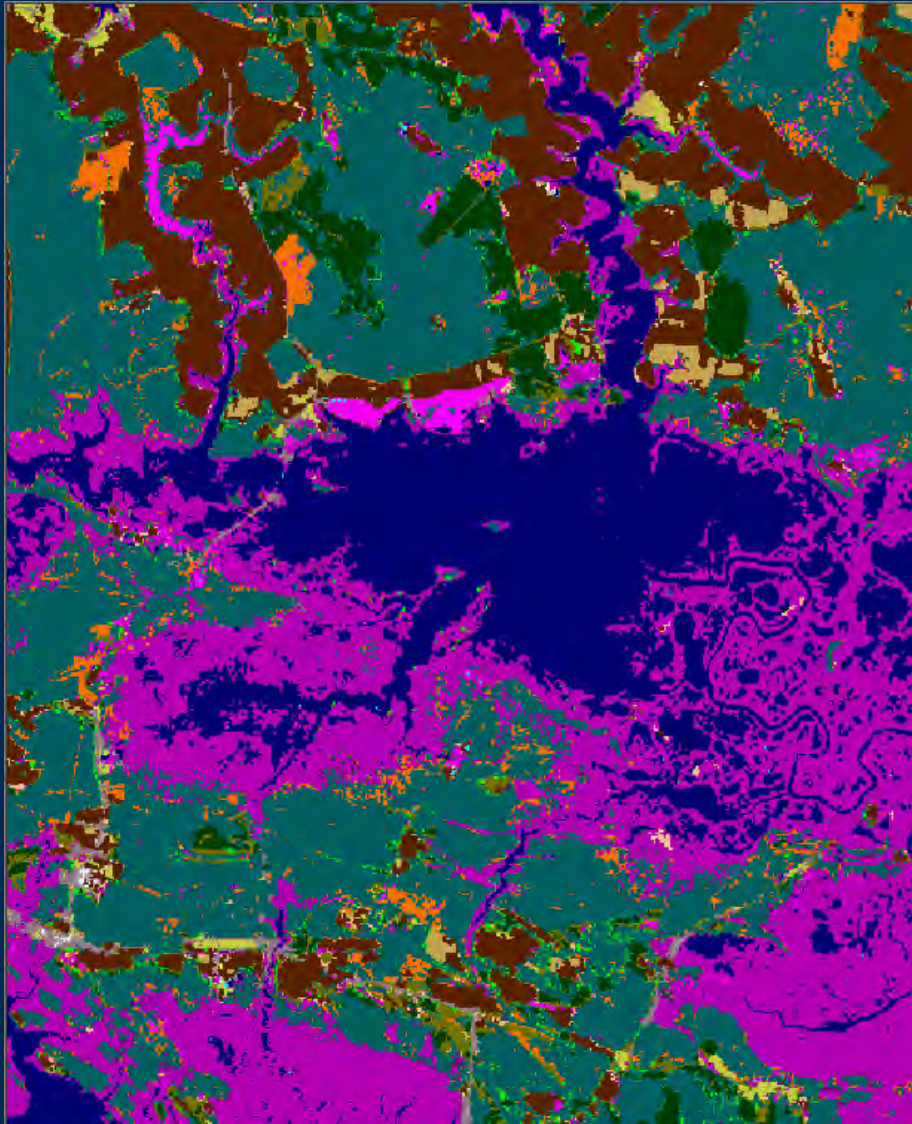
To monitoring **coastal** changes on a 5-year repeat cycle



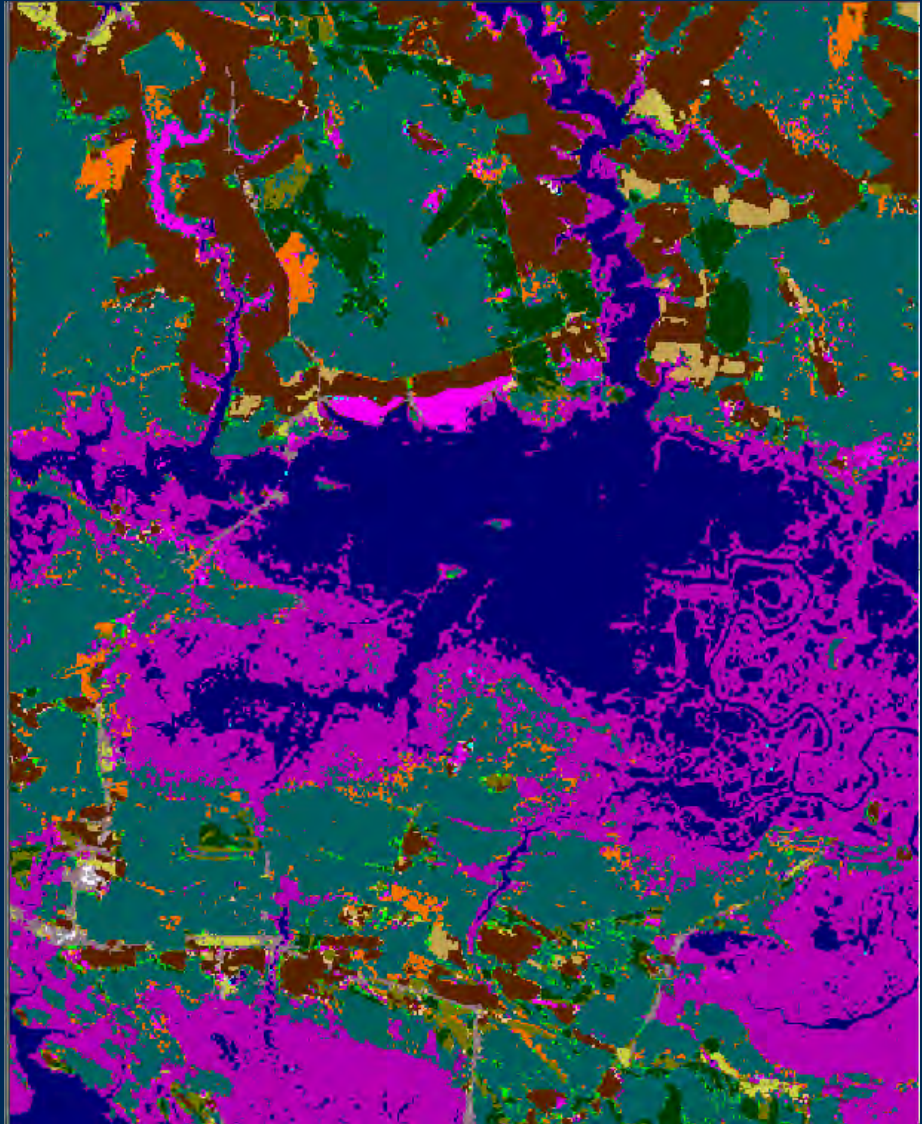
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Screening for Wetland Changes

Blackwater NWR, Maryland



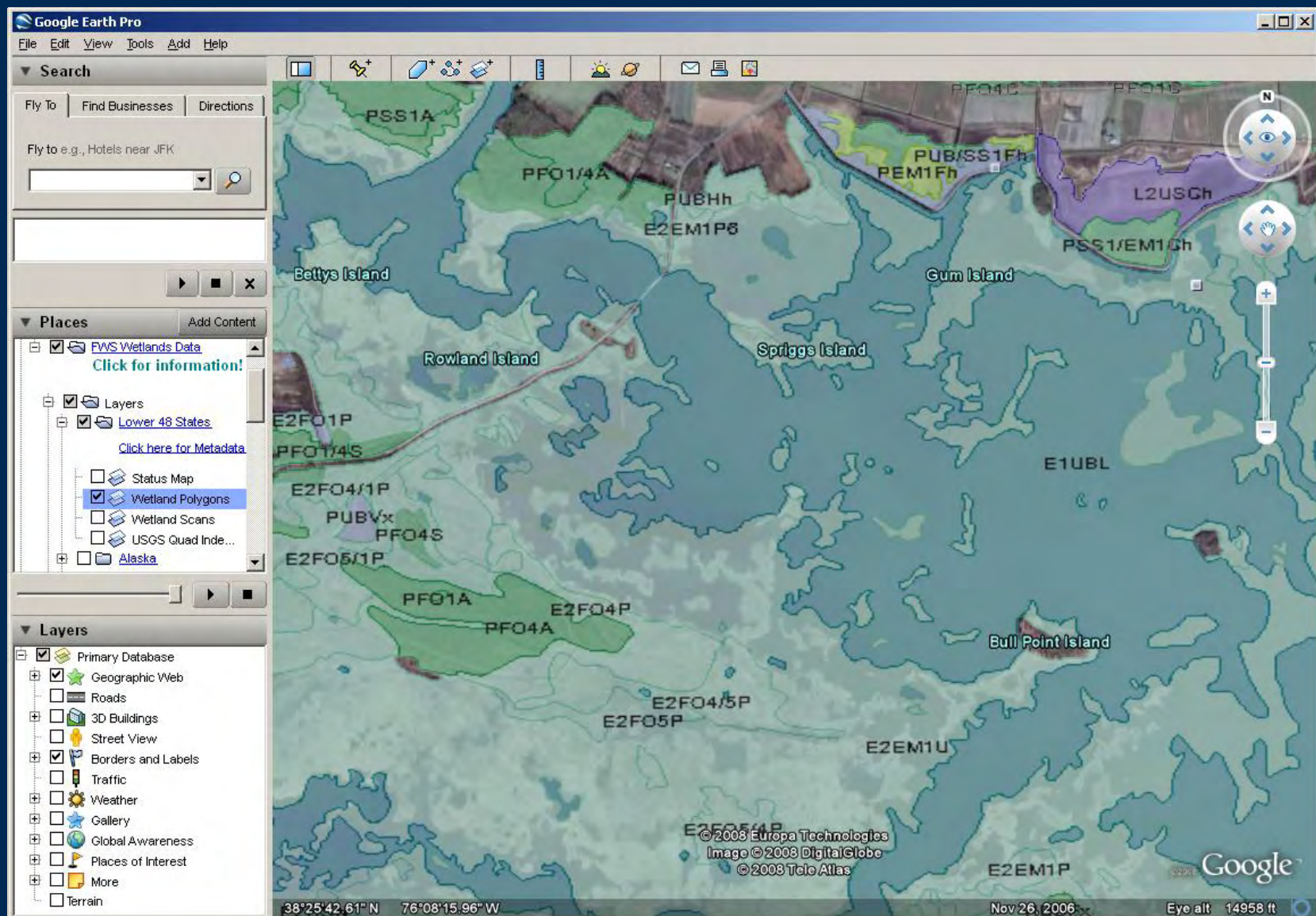
1996



2001

Screening for Wetland Changes

Blackwater NWR, Maryland



C-CAP Provides Important Context

Results of 2001 Mapping

- Area equal to the size of the state of Maine changed, in the Coastal CONUS, between 1996 and 2001
 - Largest area(s) of change are a result of siculture activities
 - Many of these can be offsetting changes with little net impact
- Increase in developed area equal to 7.5 times the area of New York City (2,275 sq miles)
 - 10% of coastal counties account for almost half of this total
 - Occurring at a faster rate in the Southeast (53%)
 - Approx. half of this increased development area is low intensity

7%

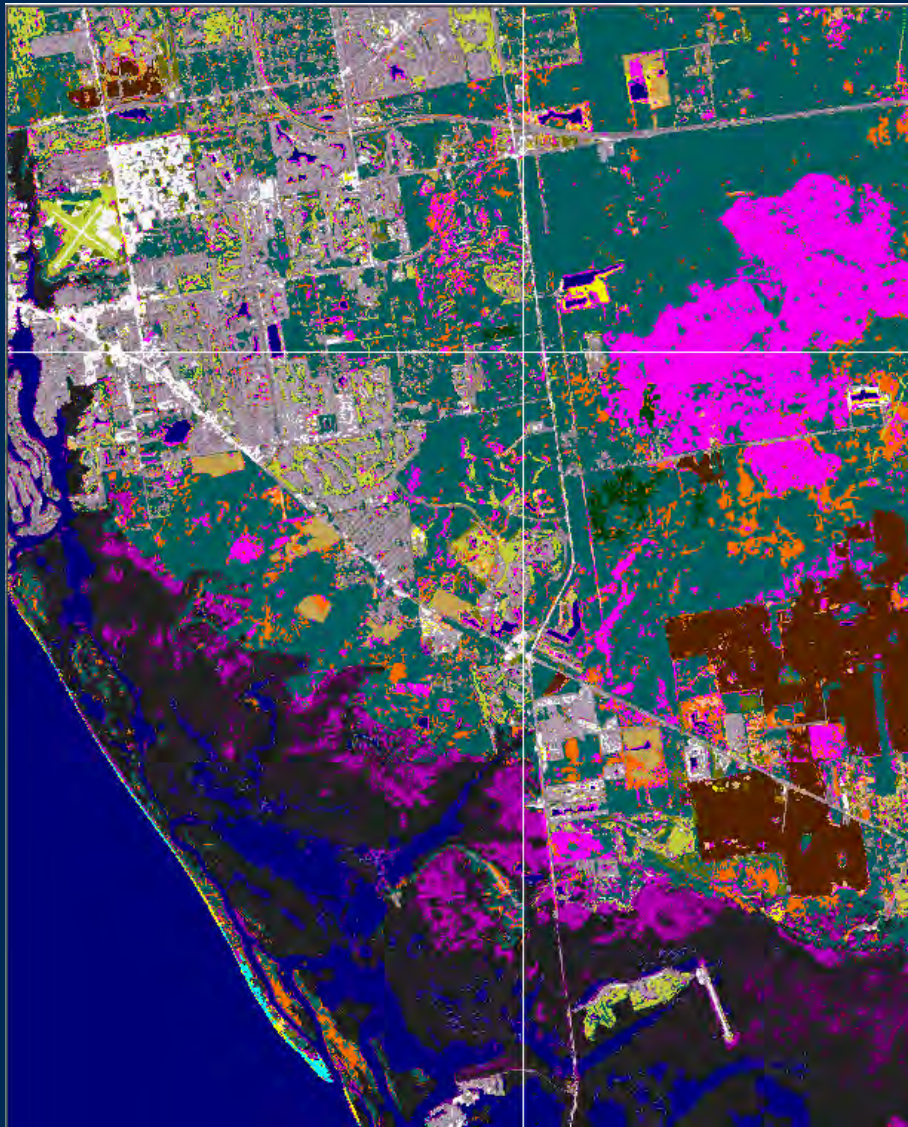
*“NOAA Issues New Land Cover Assessment
showing Increasing U.S. Coastal
Development”*



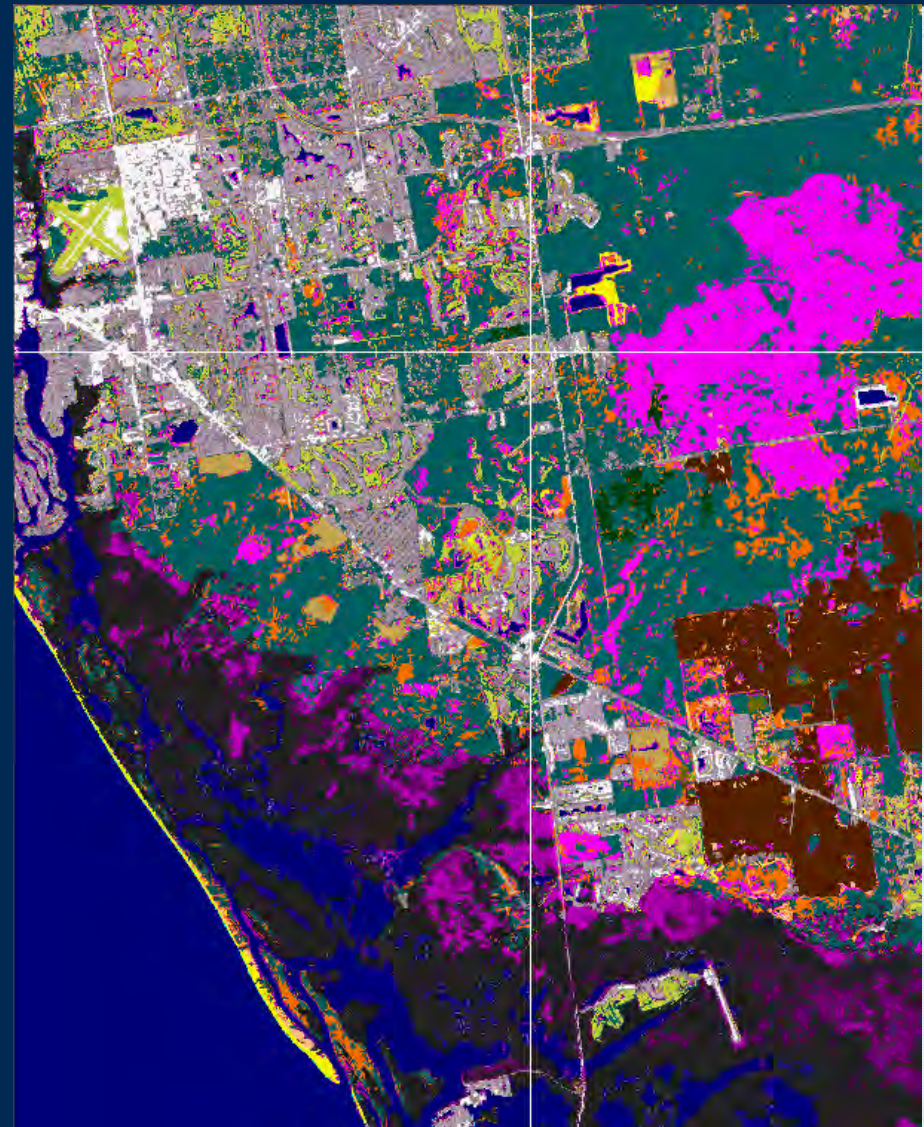
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C-CAP Provides Important Context

Rookery Bay NERR, Florida



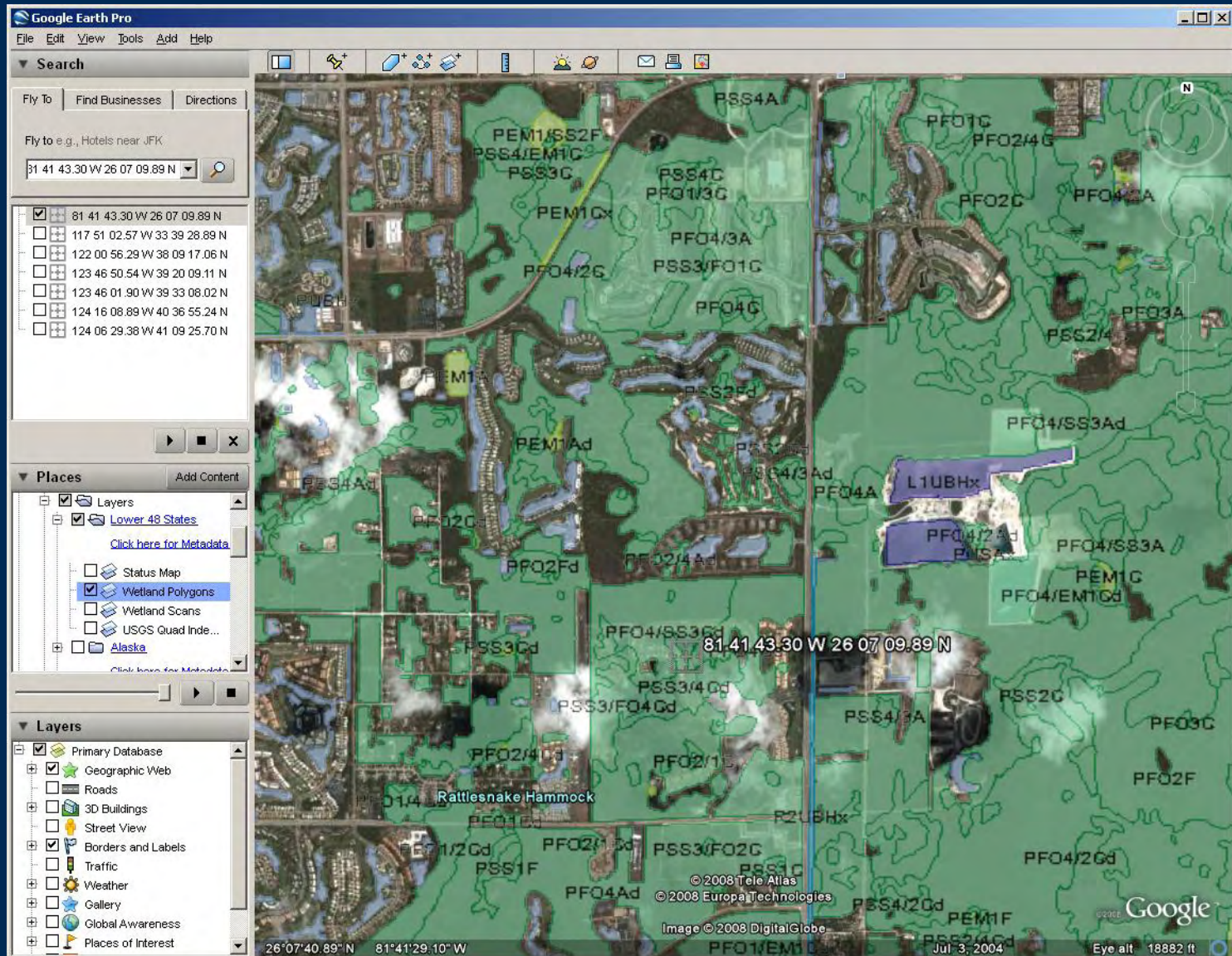
1996



2001

C-CAP Provides Important Context

Rookery Bay NERR, Florida



Decision Support for Water Quality

Nonpoint-Source Pollution and Erosion Comparison Tool (N-SPECT)

- Calculates nonpoint pollutant and sediment loads
- Utilizes land cover, topography, precipitation data, and soils data (incorporates SCS curve numbers)
- Compares output to water quality standard



Impervious Surface Analysis Tool (ISAT)

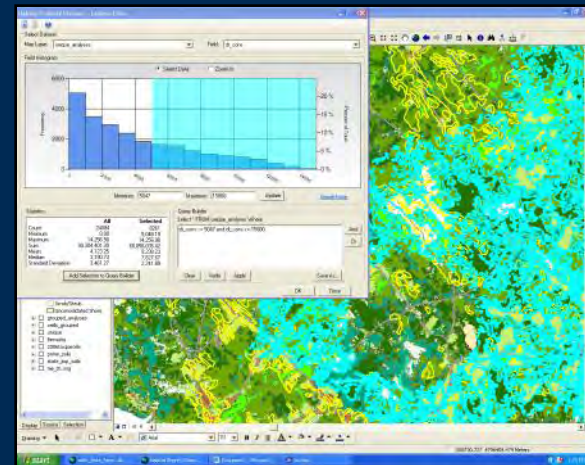
- Calculates nonpoint pollutant and sediment loads
- Utilizes land cover, topography, precipitation data, and soils data (incorporates SCS curve numbers)
- Compares output to water quality standard
- First deployment in Oahu, HI



Decision Support for Conservation

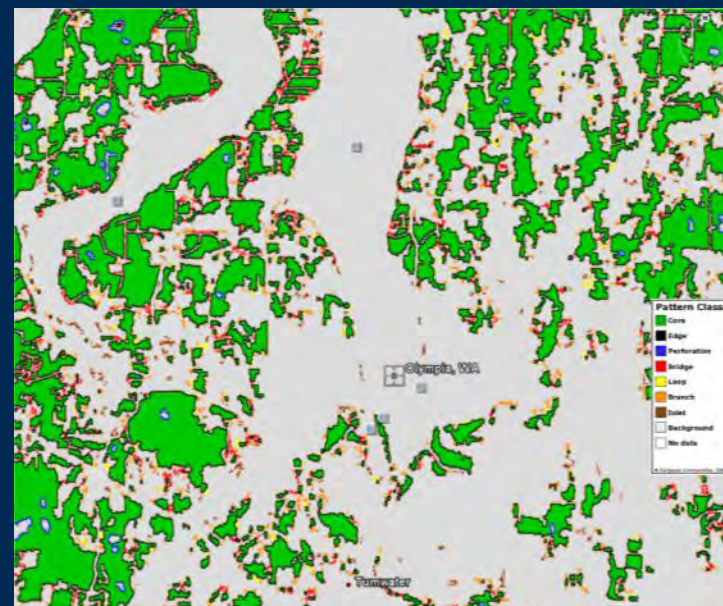
Habitat Priority Planner (HPP)

- Designed as an interactive screening tool for selecting conservation priority sites
- Utilizes land cover, as well as other ancillary data



Land Fragmentation Tool (from NEMO)

- UConn Center for Land Use Education
- Based upon techniques developed by the U.S. Forest Service for analyzing forest fragmentation
- Developed in partnership with Placeway's Inc. (CommunityViz people)
- Incorp into CommunityViz and ArcGIS





High Resolution Land Cover

- Customer demand / need . . .
and
- Increasingly available, high-res
imagery and supporting data
provide
- New opportunities to
 - Introduce new data streams
 - Introduce new approaches
 - Increase focus on coastal issues

“Our goal is to provide consistent, accurate, nationally relevant data at a spatial scale more appropriate for support of increasingly detailed, site-specific, management decisions”.



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Santa Cruz, CA

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▼ PlacesAdd Content

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Pacific Trust Islands

Click for information!

☐

Legend: Wetland Types

Click for information!

☐

Legend: Status Map

Click for information!

☐

US Fish and Wildlife

☒

Temporary Places

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Temporary Places

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santa cruz hr ccap 4m

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Legend

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Geographic Web

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Roads

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3D Buildings

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Street View

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Borders and Labels

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Traffic

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Weather

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Gallery

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Global Awareness

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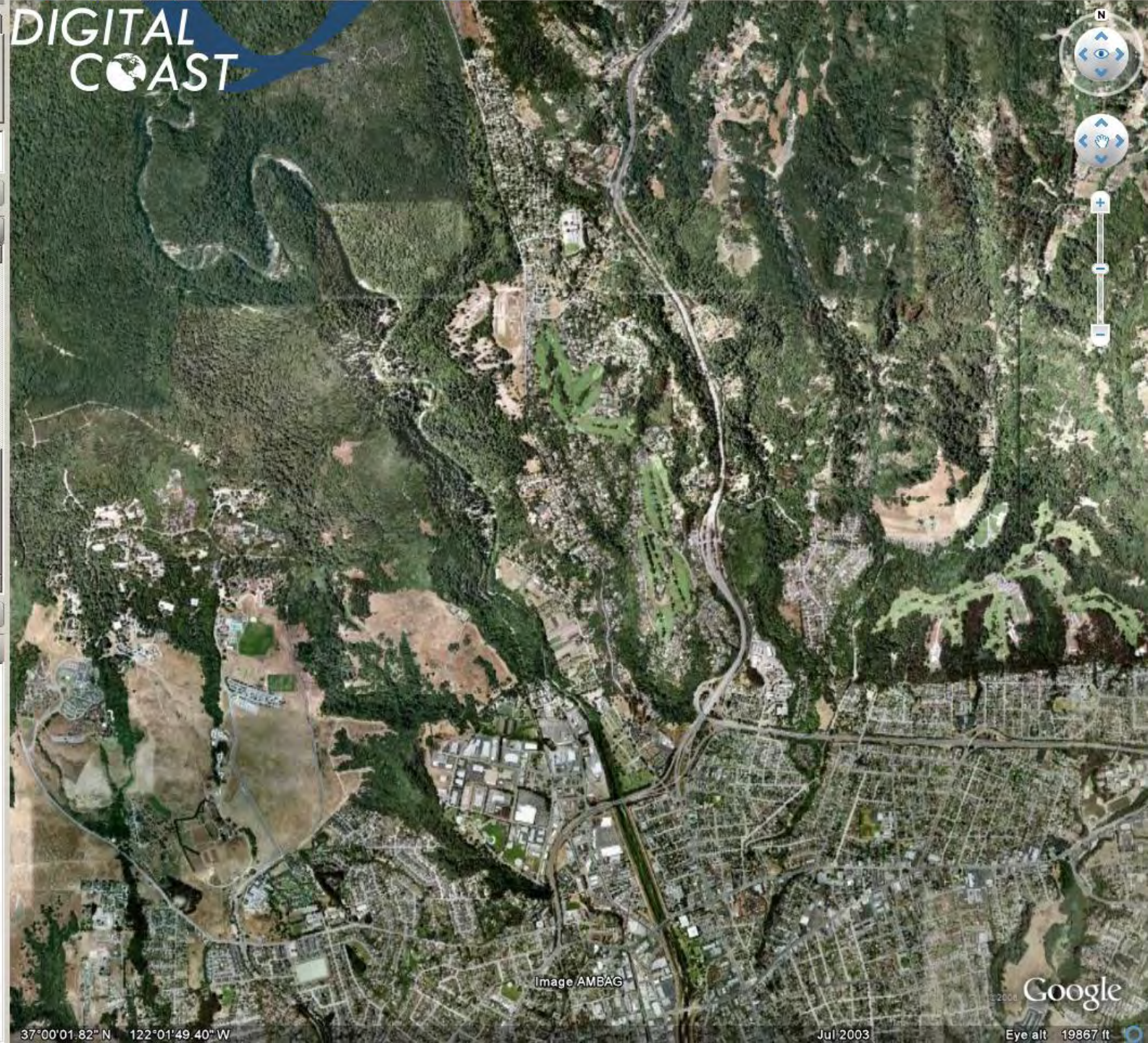
Places of Interest

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More

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Terrain



DIGITAL
COAST

Image AMBAG

Google

37°00'01.82" N 122°01'49.40" W

Jul 2003

Eye alt 19867 ft

Fly To

Find Businesses

Directions

Fly to e.g., 94043

Santa Cruz, CA

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Add Content

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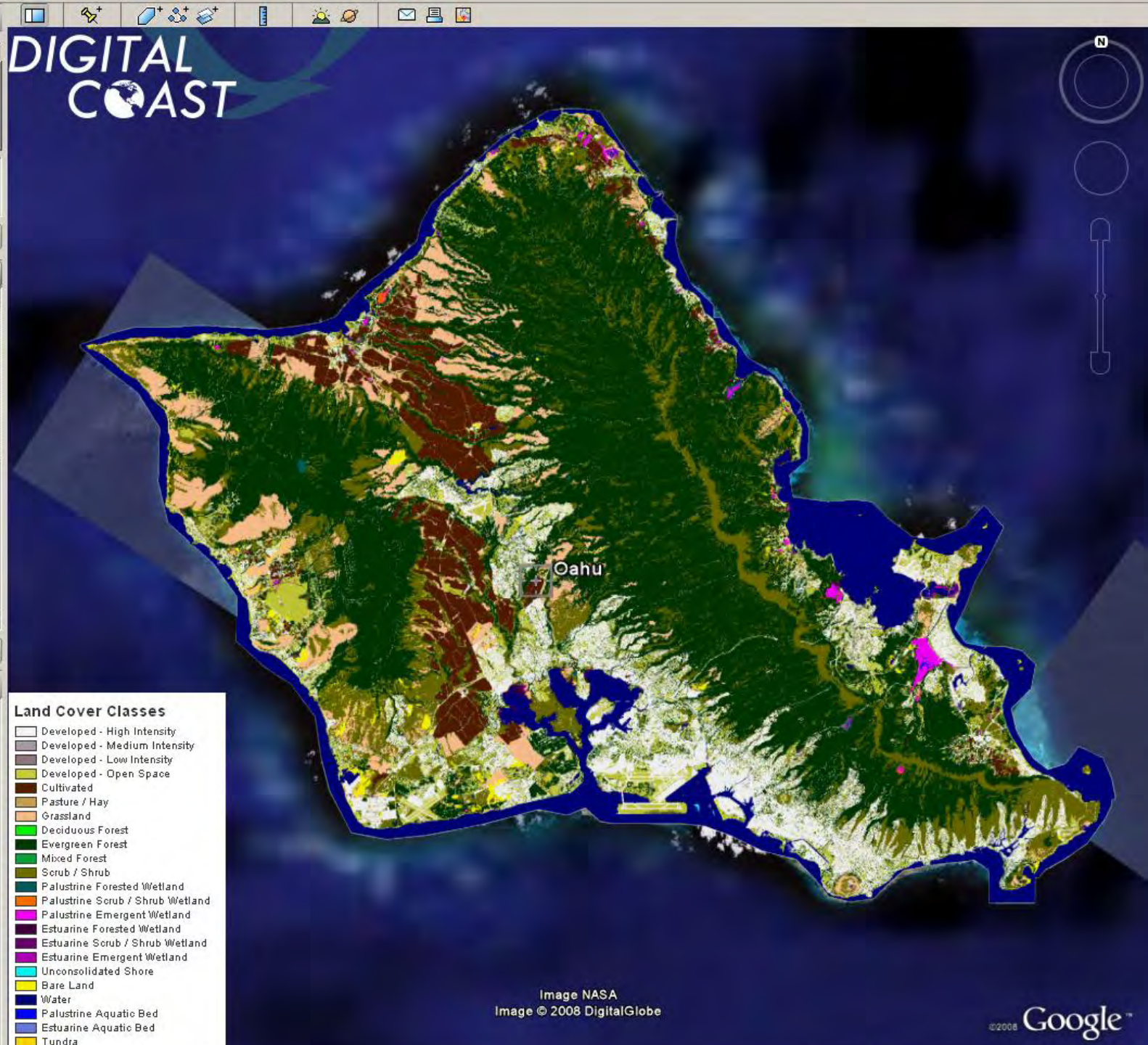
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Terrain



- ☐ Status Map
- ☐ Wetland Polygons
- ☒ Puerto Rico & US VI
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Land Cover Classes	
	Developed - High Intensity
	Developed - Medium Intensity
	Developed - Low Intensity
	Developed - Open Space
	Cultivated
	Pasture / Hay
	Grassland
	Deciduous Forest
	Evergreen Forest
	Mixed Forest
	Scrub / Shrub
	Palustrine Forested Wetland
	Palustrine Scrub / Shrub Wetland
	Palustrine Emergent Wetland
	Estuarine Forested Wetland
	Estuarine Scrub / Shrub Wetland
	Estuarine Emergent Wetland
	Unconsolidated Shore
	Bare Land
	Water
	Palustrine Aquatic Bed
	Estuarine Aquatic Bed
	Tundra

Fly To Find Businesses Directions

Fly to e.g., 94043

oahu, hi

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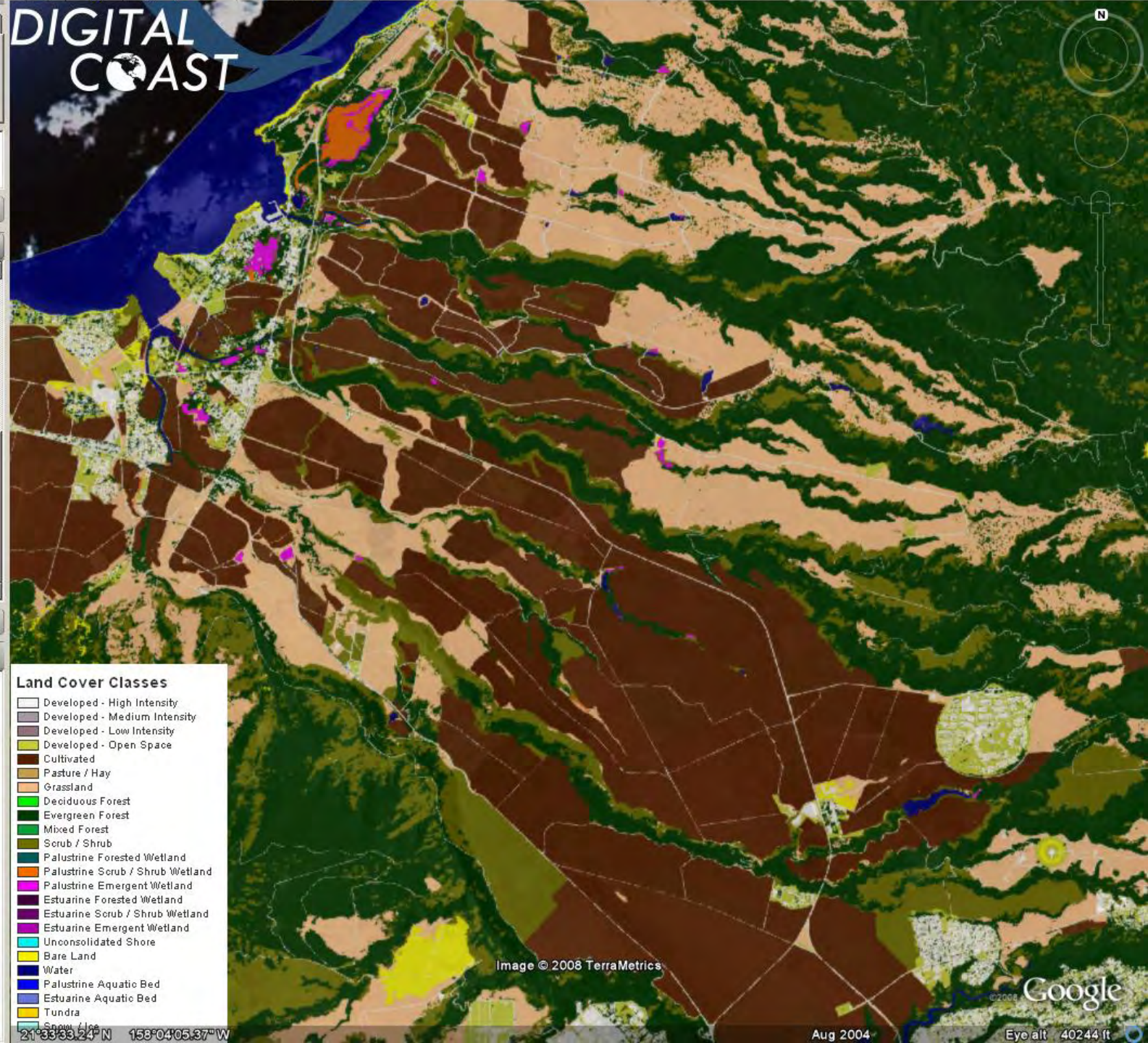
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- Snow / Ice

Image © 2008 TerraMetrics

Google

21°33'32.24" N 158°04'05.37" W

Aug 2004

Eye alt 40244 ft

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Image © 2008 TerraMetrics

Google

Eye alt 13079 ft

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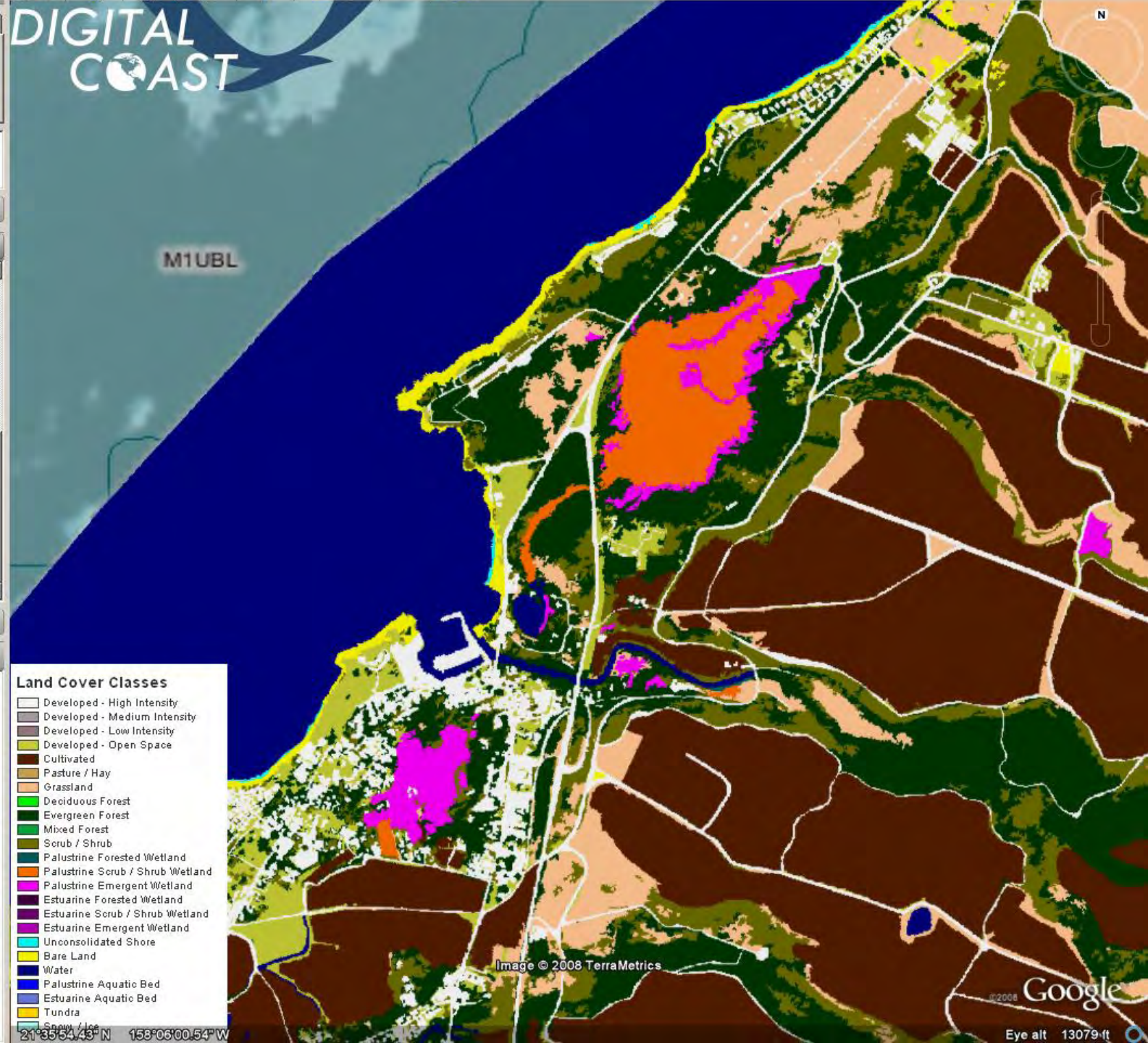
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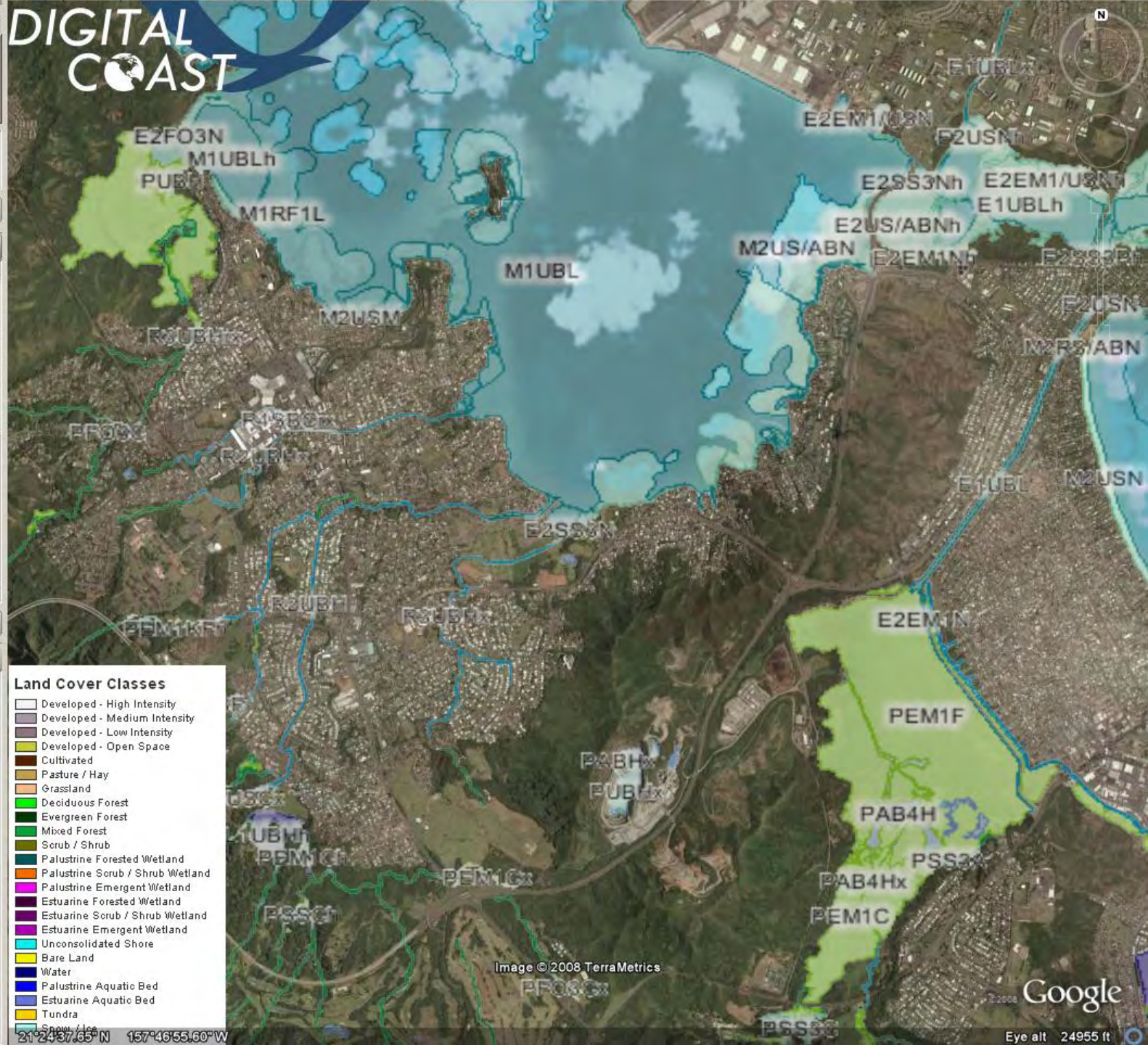
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Oahu

Places

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Borders and Labels

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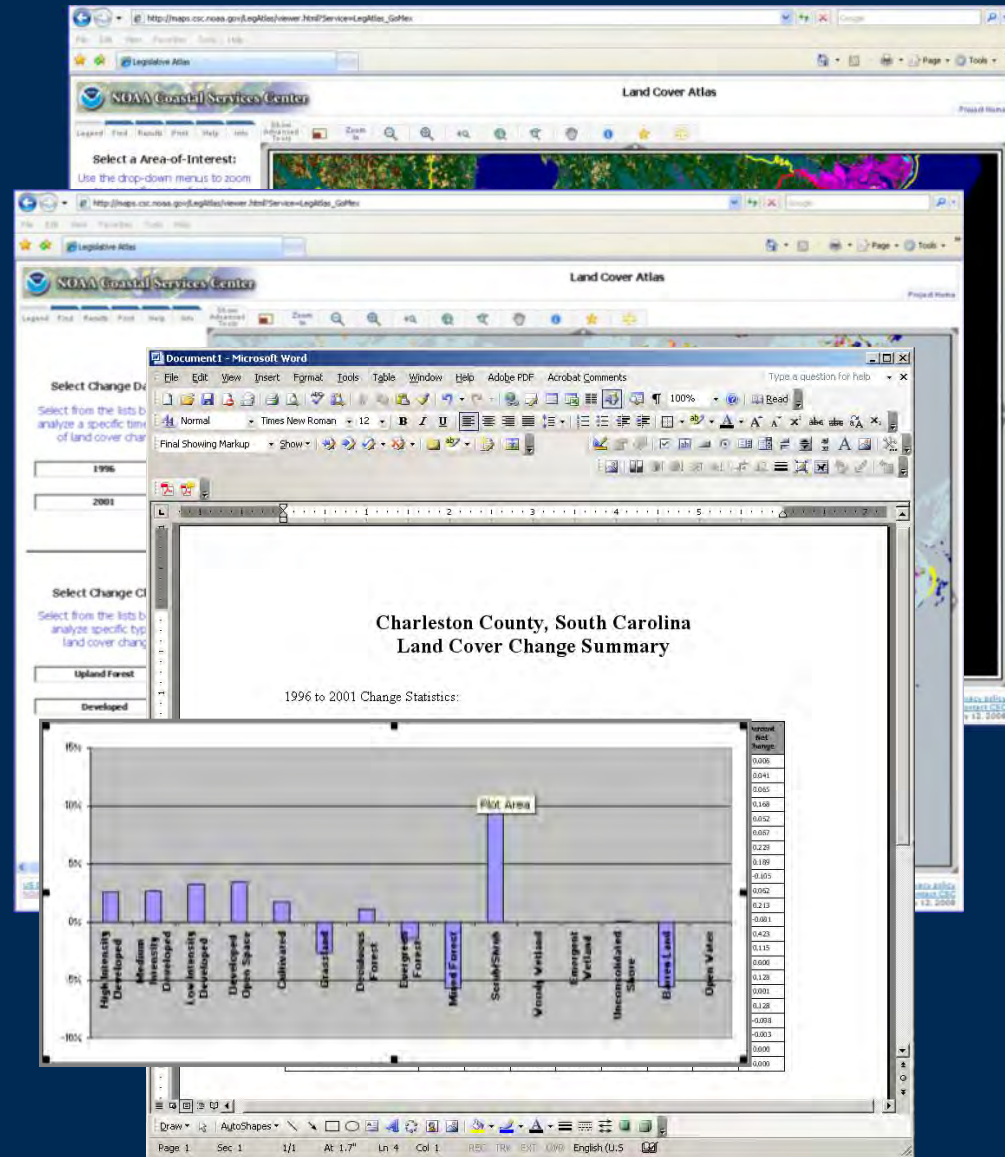
Google

Eye alt 24955 ft

21°24'37.65" N 157°46'55.60" W

Coming Soon!

- **Concept similar to the Washington Coastal Atlas**
- **Tied closely to NOAA's Digital Coast Effort**
- **Way for technical and non-technical users to:**
 - Visualize land cover distribution, condition
 - Query and analyze specific changes of interest
 - Generate reports, maps, and summary info



March 2 to 5, 2009
Myrtle Beach, South Carolina



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GEOTOOLS**

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www.csc.noaa.gov/geotools/

Questions?

Nate Herold
National C-CAP Coordinator
843-740-1183

Nate.Herold@noaa.gov

www.csc.noaa.gov/landcover

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