2015

Sea Level Rise Toolbox

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**Recommended Citation**

Fu, Zhaohui Jennifer; Mcgillicuddy, Dan; and Jacobson, Susan, "Sea Level Rise Toolbox" (2015). GIS Center. 42.
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Sea Level Rise Toolbox

A Web/Mobile Application to Project the Rising Sea in South Florida

Zhaohui Jennifer Fu
Dan Mcgillicuddy, GIS Center, FIU
Susan Jacobson, School of Journalism and Mass Communication, FIU
Who is involved in development?

- Faculty and Student from FIU School of Journalism and Mass Communication (the primary originator and user)
- FIU GIS Center researchers and developers
  1. Peter Harlem, Creator of the Sea Level Rise maps (from 1-6 ft)
  2. Dan Mcgillicuddy, Developer of the App

Public URL: http://eyesonthrise.org/app/
Components and Framework

**METHODS**
- Google Elevation Service, Google Maps API
- Using ArcGIS Server to visualize LiDAR by FDEM
- Miami-Dade 311 Flood Reports
- Documenting Eye on the Rise by Students
- Yearly High Tides and Recent Water Levels (NOAA)
- FEMA Flood Insurance Rate Maps (FIRMs)

**FUNCTIONALITY**
- Locate and identify the elevation of the location
- Sliding bar to display sea level rise from 1-6 ft
- FEMA flood zones
- Points of 311 flood reports
- Mobile interface for students or public to report flooding (King Tide Day)
- Connecting the current NOAA tidal and water level diagrams and reports to the actual point location
- Visualizing categories of FIRM zones by location

Public URL: [http://eyesontherise.org/app/](http://eyesontherise.org/app/)
About GIS Center’s Web GIS – Key Components

1. **Cloud APIs integration**
   - Google APIs, Facebook APIs, Foursquare APIs, Bing Maps APIs, ArcGIS Online

2. **ArcGIS Server**
   - Product from ESRI

3. **Rich client applications**
   - Rich client side logic
   - AJAX for server side data communication

4. **Web Service (WCF 4.0) site**
   - Windows Communication Foundation, from Microsoft.NET framework 4.0, is designed for cross developing platform distributing system

Public URL: [http://eyesontherise.org/app/](http://eyesontherise.org/app/)
System Architecture

{SOA} Platform

- JavaScript
- HTML5 + CSS3
- Java
- PHP + NODE.JS
- .NET C#
- OTHERS...

Cloud Services

- Data Visualization
- Cloud Sourcing
- Data Management...

Cloud Implementation

- Microsoft Azure
- Amazon S3
- Google Cloud

Rich Client Side Application

- JavaScript

Data Center Implementation

- RESTful Services
- AS/400, DB2, CPF
- OS/400, AS/400
- Database Server
- File Server
- FTP Server

- GIS Server
- OVF A4 A5 Site
- Image Server & Video Server
- Indexing Server

- Database Server
- Database Server
- File Server
Stakeholders

User Community
- Content Ingestion
- User feedback
- Documentation

FIU GIS Center
- Software Development
- System Configuration

FIU SJMC
- User Coordination
- Marketing
- Increase awareness

County, State Agencies
- Data Sources
- Web Services

Public URL: http://eyesontherise.org/app/
A Demo

Public URL: http://eyesontherise.org/app/

- Location
- Google Map APIs
- Google Elevation Services
A Demo

Public URL: http://eyesontherise.org/app/

- Sliding Bar
- Sea Level Visualization
- Google Map APIs
- ArcGIS Server
- State of Florida Division of Emergency Management LiDAR ProjectLAS Dataset
A Demo

Development URL: http://digir.fiu.edu/sealevelrise/

- Find Flood Reports
- Remove Flood Reports
- Google Map APIs
- ArcGIS Server
- Miami-Dade 311 Flood Reports
- Crowd-Sourced Eye on the Rise Flood Documents
A Demo

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- Location
- Display of FEMA Flood Zones
- Google Map APIs
- ArcGIS Server
- FIRMs

Help
FEMA Flood Zone

Data from FEMA Flood Insurance Rate Maps (FIRMs) where available. FEMA's National Flood Hazard Layer is shown on the map.

Flood Zones Legend

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee