

Google Ocean

Research Under : Professor Robert Kelly

By :

Ankush Gulati

Ritin Suthakaran

Subramanian Arumugam



Overview

- ❑ The Great South Bay Project
 - Existing data analysis methodology
 - What value can we add to the project
- ❑ Google Earth – Introduction
 - Adding placemarks
- ❑ Proposed methodology
 - How do you access it?
 - The Great South Bay project website
 - Private Google Earth
 - Public Google Earth
- ❑ Advantages of new methodology

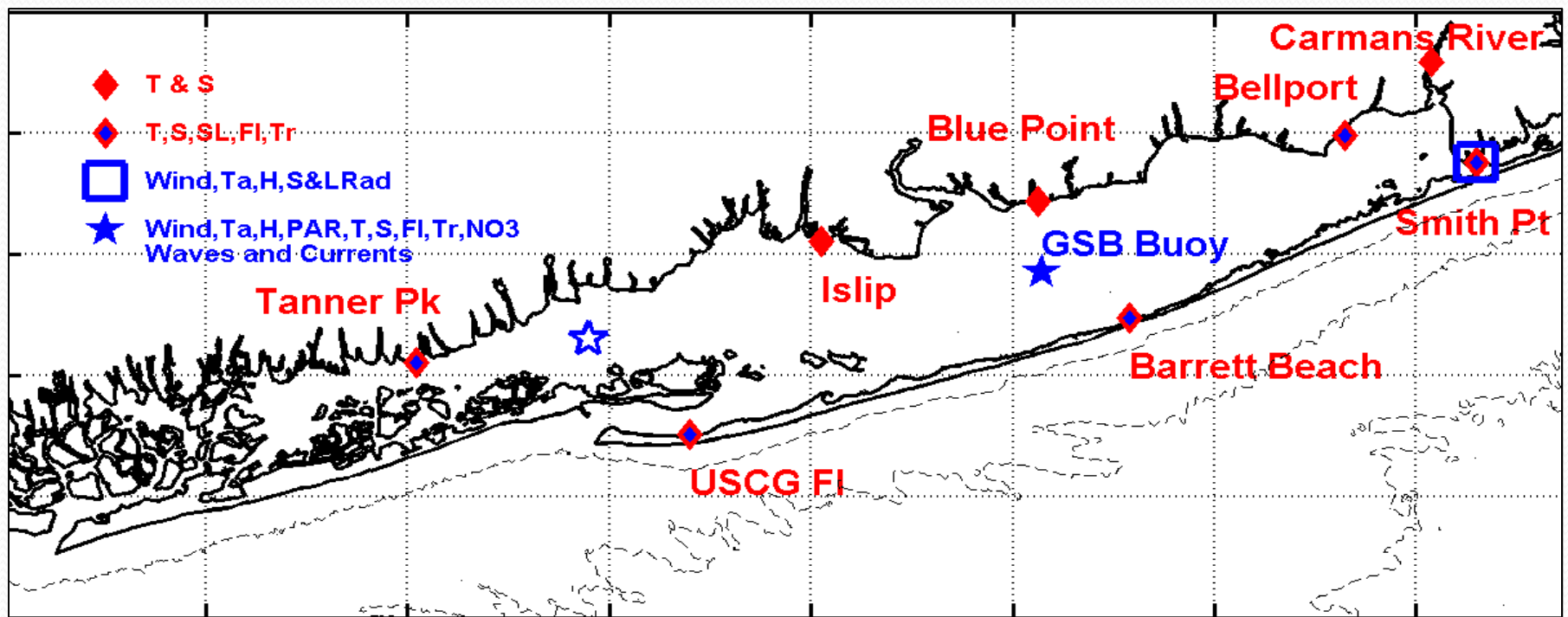


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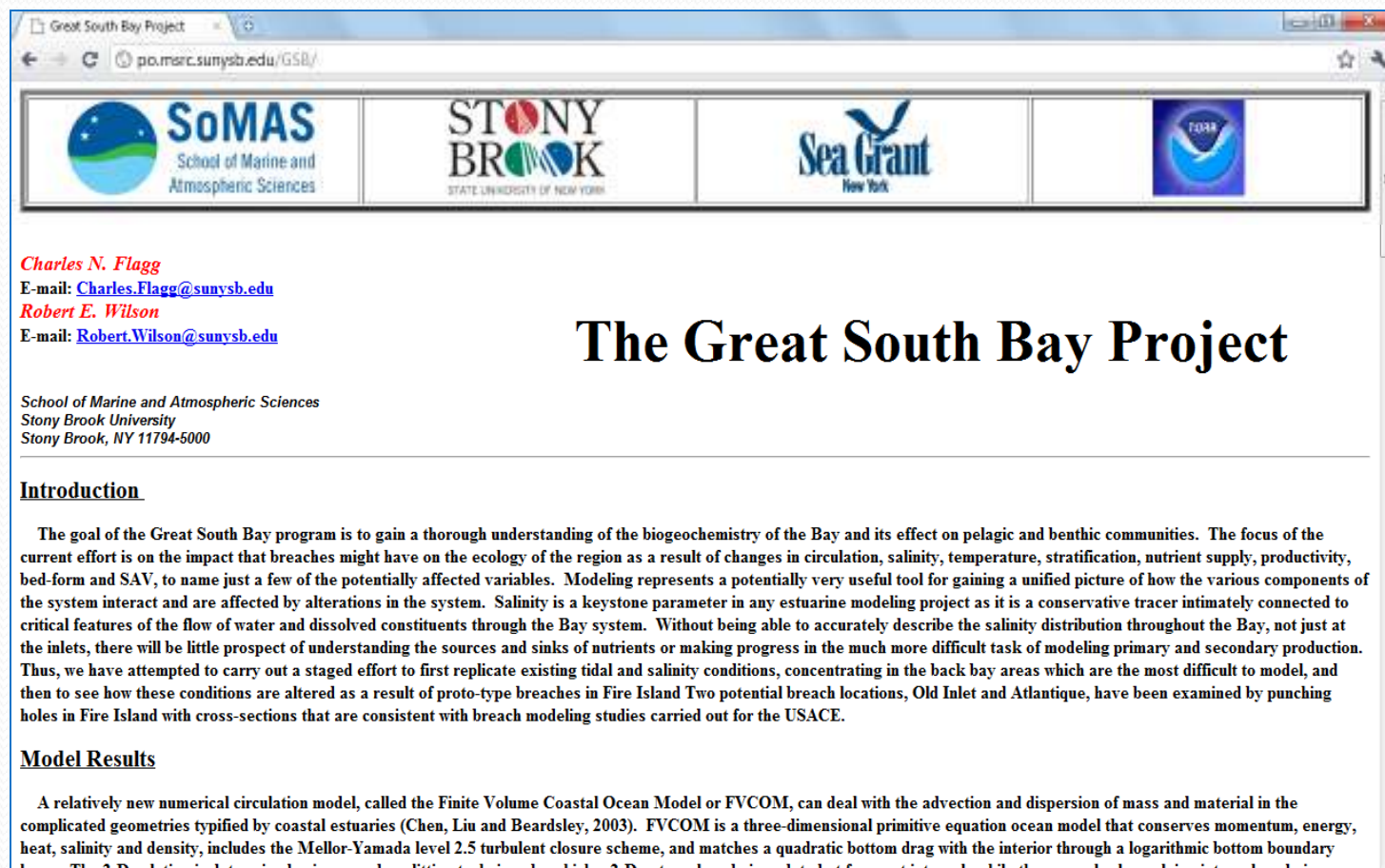
The Great South Bay project

*A project of the School of Marine and Atmospheric Sciences,
Stony Brook University*



Existing Data Analysis Methodology

Navigate to the website <http://po.msrc.sunysb.edu/GSB/>

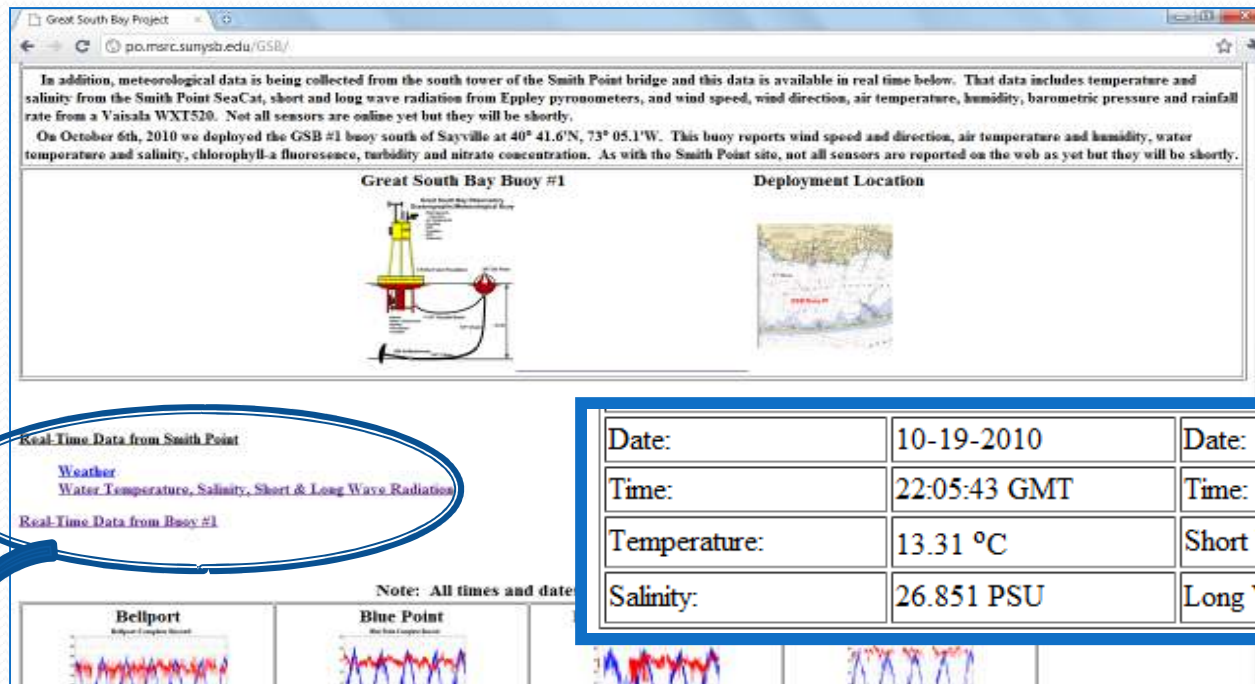


The screenshot shows a web browser window with the address bar displaying "http://po.msrc.sunysb.edu/GSB/". The page features a header with four logos: SoMAS (School of Marine and Atmospheric Sciences), Stony Brook (State University of New York), Sea Grant (New York), and NOAA. Below the header, the text "Charles N. Flagg" is followed by "E-mail: Charles.Flagg@sunysb.edu". Below that, "Robert E. Wilson" is followed by "E-mail: Robert.Wilson@sunysb.edu". The main heading "The Great South Bay Project" is centered. To the left, the address "School of Marine and Atmospheric Sciences, Stony Brook University, Stony Brook, NY 11794-5000" is listed. The "Introduction" section begins with "The goal of the Great South Bay program is to gain a thorough understanding of the biogeochemistry of the Bay and its effect on pelagic and benthic communities. The focus of the current effort is on the impact that breaches might have on the ecology of the region as a result of changes in circulation, salinity, temperature, stratification, nutrient supply, productivity, bed-form and SAV, to name just a few of the potentially affected variables. Modeling represents a potentially very useful tool for gaining a unified picture of how the various components of the system interact and are affected by alterations in the system. Salinity is a keystone parameter in any estuarine modeling project as it is a conservative tracer intimately connected to critical features of the flow of water and dissolved constituents through the Bay system. Without being able to accurately describe the salinity distribution throughout the Bay, not just at the inlets, there will be little prospect of understanding the sources and sinks of nutrients or making progress in the much more difficult task of modeling primary and secondary production. Thus, we have attempted to carry out a staged effort to first replicate existing tidal and salinity conditions, concentrating in the back bay areas which are the most difficult to model, and then to see how these conditions are altered as a result of proto-type breaches in Fire Island Two potential breach locations, Old Inlet and Atlantique, have been examined by punching holes in Fire Island with cross-sections that are consistent with breach modeling studies carried out for the USACE." The "Model Results" section begins with "A relatively new numerical circulation model, called the Finite Volume Coastal Ocean Model or FVCOM, can deal with the advection and dispersion of mass and material in the complicated geometries typified by coastal estuaries (Chen, Liu and Beardsley, 2003). FVCOM is a three-dimensional primitive equation ocean model that conserves momentum, energy, heat, salinity and density, includes the Mellor-Yamada level 2.5 turbulent closure scheme, and matches a quadratic bottom drag with the interior through a logarithmic bottom boundary layer. The 3-D solution is determined using a mode-splitting technique by which a 2-D external mode is updated at frequent intervals while the more slowly evolving internal mode is

Existing Data Analysis Methodology

- Access the data:

✓ *Real Time Data:*



Select the link for a specific instrument and analyze the table

Existing Data Analysis Methodology

✓ *Detailed/Archived Data:*

The screenshot displays the 'DataSouth Bay Project' website. On the left, a list of links for individual instrument deployments is provided, including Barlett Beach, Bellport, Blue Point, Islip Hatchery, Smith Point, Tanager Park, and USCG Fire Island Inlet. Below this, a section titled 'Useful Websites' lists resources like Current Precipitation Map, NDBC Buoy 44025, Islip Airport Weather, Brookhaven Airport Weather, Local Tanager Weather, and OceanWeather.COM. A large blue oval callout with arrows pointing to the deployment links and the 'Matfiles' section contains the text: 'Download the Matlab files for a specific instrument and analyze the data on Matlab on your machine.' The right side of the screenshot shows the 'Barrett Beach SeaCat Results' page, which features two time-series plots for the periods March 2010 - July 2010 and July 2010 - October 2010. Below the plots, there are links for 'Matfiles (right-click to download)' for the same two time periods.

Click on the sites listed below to see the plots of the individual deployments for greater detail

[Barlett Beach](#)
[Bellport](#)
[Blue Point](#)
[Islip Hatchery](#)
[Smith Point](#)
[Tanager Park](#)
[USCG Fire Island Inlet](#)

Matfiles (right-click to download)
[Bellport Record](#)
[Blue Point Record](#)
[Islip Hatchery Record](#)
[Smith Point Record](#)
[Tanager Park Record](#)
[USCG Fire Island Inlet](#)

Useful Websites

[Current Precipitation Map](#)
A map of the United States showing precipitation.
[NDBC Buoy 44025](#)
Shows a 3-meter discus buoy South of Long Island.
[Islip Airport Weather](#)
[Brookhaven Airport Weather](#)
[Local Tanager Weather](#)
Gives basic weather information for ocean front around Long Island.
[OceanWeather.COM](#)
Click on the Current Marine Data and the corresponding area to see more height and wind data over the ocean.

Download the Matlab files for a specific instrument and analyze the data on Matlab on your machine.

Barrett Beach SeaCat Results

March 2010 - July 2010 July 2010 - October 2010

Matfiles (right-click to download)
[March 2010 - July 2010](#)
[July 2010 - October 2010](#)



What Value Can we Add to the Project?

Expand its target audience by making it available to anyone and everyone over the internet.



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Google Earth

- A virtual globe, map and geographical information program
- Maps the earth by the superimposition of images obtained from satellite imagery



- Available for PCs, iPad, iPhones, Android phones etc..

Google Earth – Adding Placemarks

- Allows users to add their own contents into the virtual globe.
- Users can put a placemark at their area of interest and display specific details about it in a bubble.
- This can be achieved by giving configuration files as input to Google Earth



Google Earth

+



Configuration(KML) Files



Placemark and bubble



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Proposed Methodology

- Mapping the data on to Google Earth
- Makes the data interesting and available to public.
- Creating placemarks for the buoys in different locations on the globe.
- Showing real-time data from the buoy once the place mark is clicked.

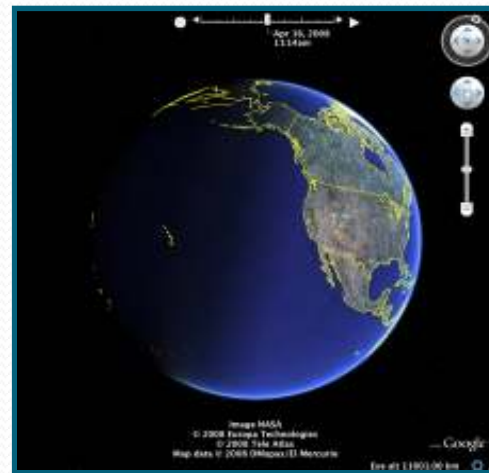
How do You Access It?

**The Great South Bay
project website**



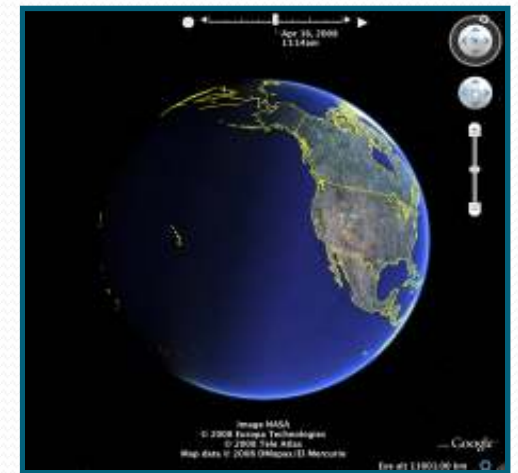
<http://islab.cs.sunysb.edu/MarineSciences>

**Private Google
Earth**



Desktop Application
*Using Configuration files

**Public Google
Earth**



www.earth.google.com
* Still to be achieved

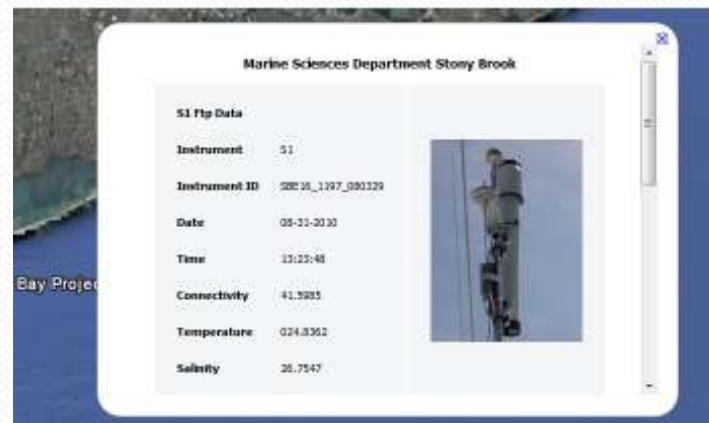
The GSB Project Website-Main Page

- Google Earth window
 - Placemarks for sensor locations
 - KML file that can be viewed on Google Earth
- View archived data from different locations
(Converted from MATLAB files)
- View archived data from the S1 instrument
 - Filtered by date range



The GSB Project Website - Placemarks Feature

- Clicking on a particular placemark pops up a bubble
- Bubble is populated with current feed from the associated sensor



- Bubble can include images, tables, or videos related to the sensor located at that placemark

The GSB Project Website - Sensor Data

- Stored on the local server database
- Includes data from S1 instrument and the archived data from other locations

S1 Archive Data

Start Date

End Date

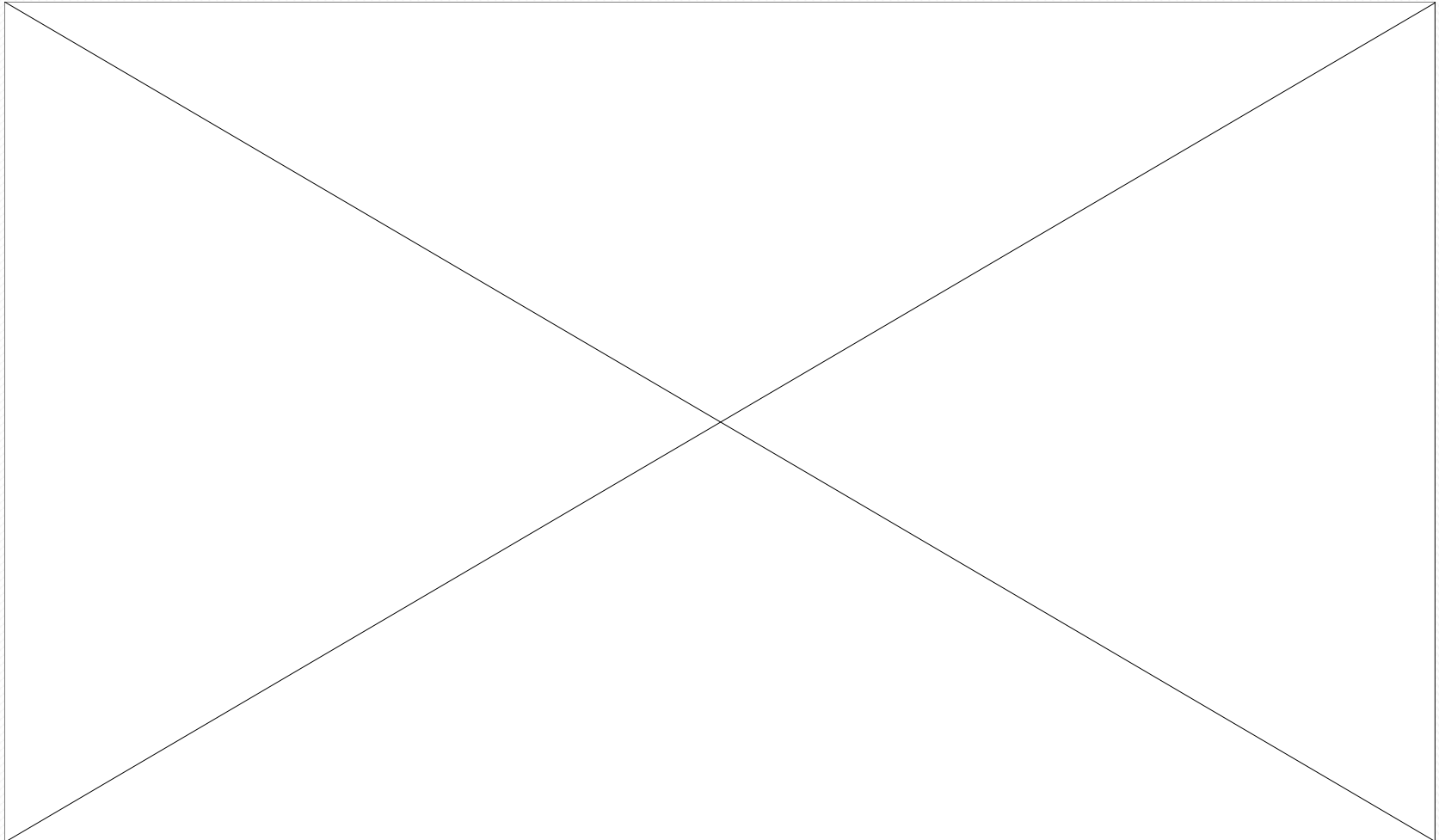
Page: (977 records total)

INSTRUMENT	INSTRUMENT ID	DATE	CONNECTIVITY	TEMPERATURE	SALINITY	TIME
S1	SBE16_1197_080329	2010-10-14	36.4195	016.5340	28.0434	19:05:45
S1	SBE16_1197_080329	2010-10-05	40.1523	016.8055	31.0464	13:17:46
S1	SBE16_1197_080329	2010-10-07	36.6660	015.3891	29.0803	11:23:46
S1	SBE16_1197_080329	2010-10-07	36.6649	015.4002	29.0712	11:29:46
S1	SBE16_1197_080329	2010-10-07	36.6281	015.3765	29.0562	11:35:46

- S1 instrument data is continuously updated by reading the file obtained from the server
- Potential to provide customized data filtering and analysis on the website

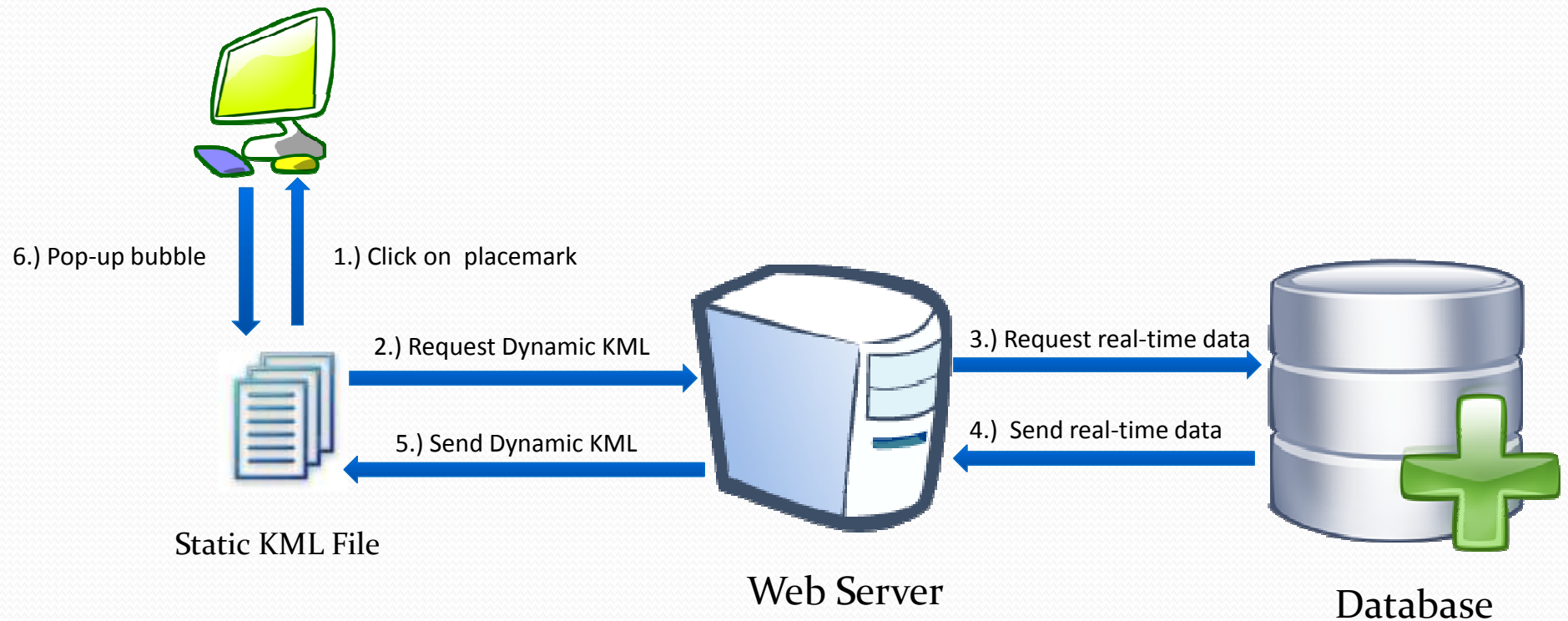


The GSB Project Website Demo



Private Google Earth - KML File

- Keyhole Markup Language file
- Stores geographic modeling information in XML format
- Static KML file modifies its contents automatically with the dynamic KML from the server



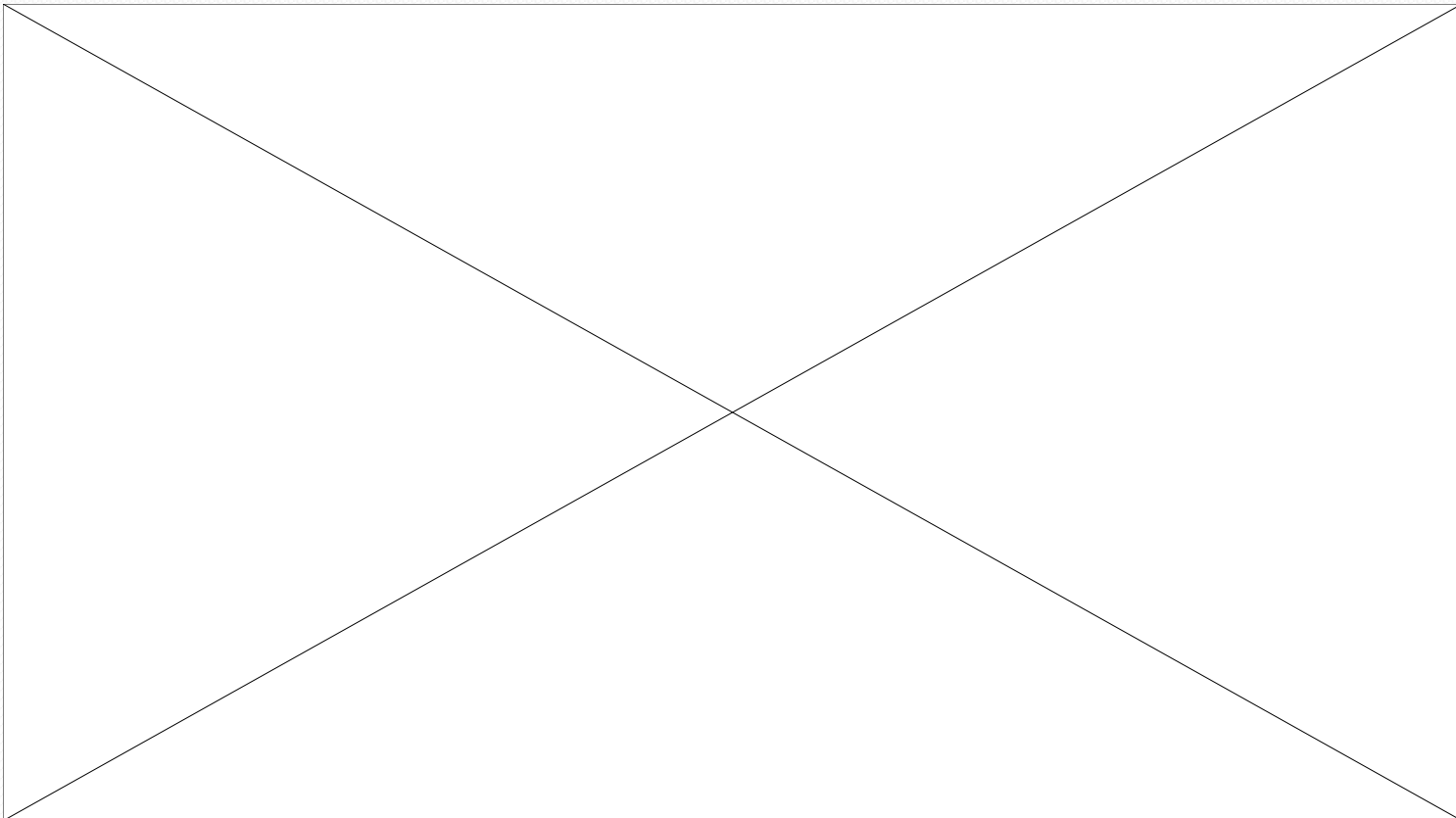


Private Google Earth - Sample KML

```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Placemark>
    <name>Simple placemark</name>
    <description>
      Attached to the ground. Intelligently places itself
      at the height of the underlying terrain.
    </description>
    <point>
      <coordinates>-122.0822035425683,37.42228990140251,0
      </coordinates>
    </point>
  </Placemark>
</kml>
```

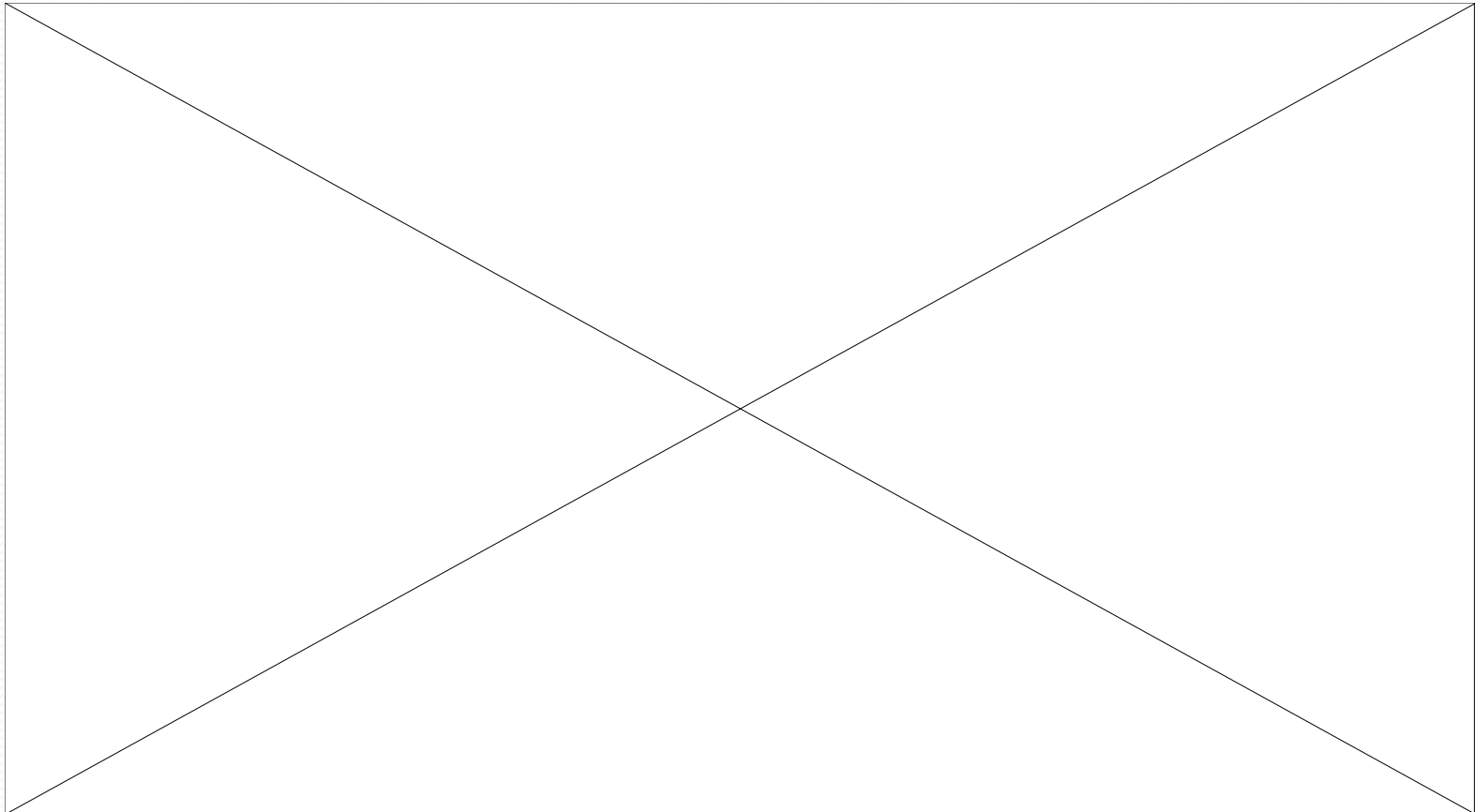
Private Google Earth - Downloading the KML

- Go to <http://islab.cs.sunysb.edu/MarineSciences>
- Click on the “Download KML” link.
- Click on the image below for a video tutorial



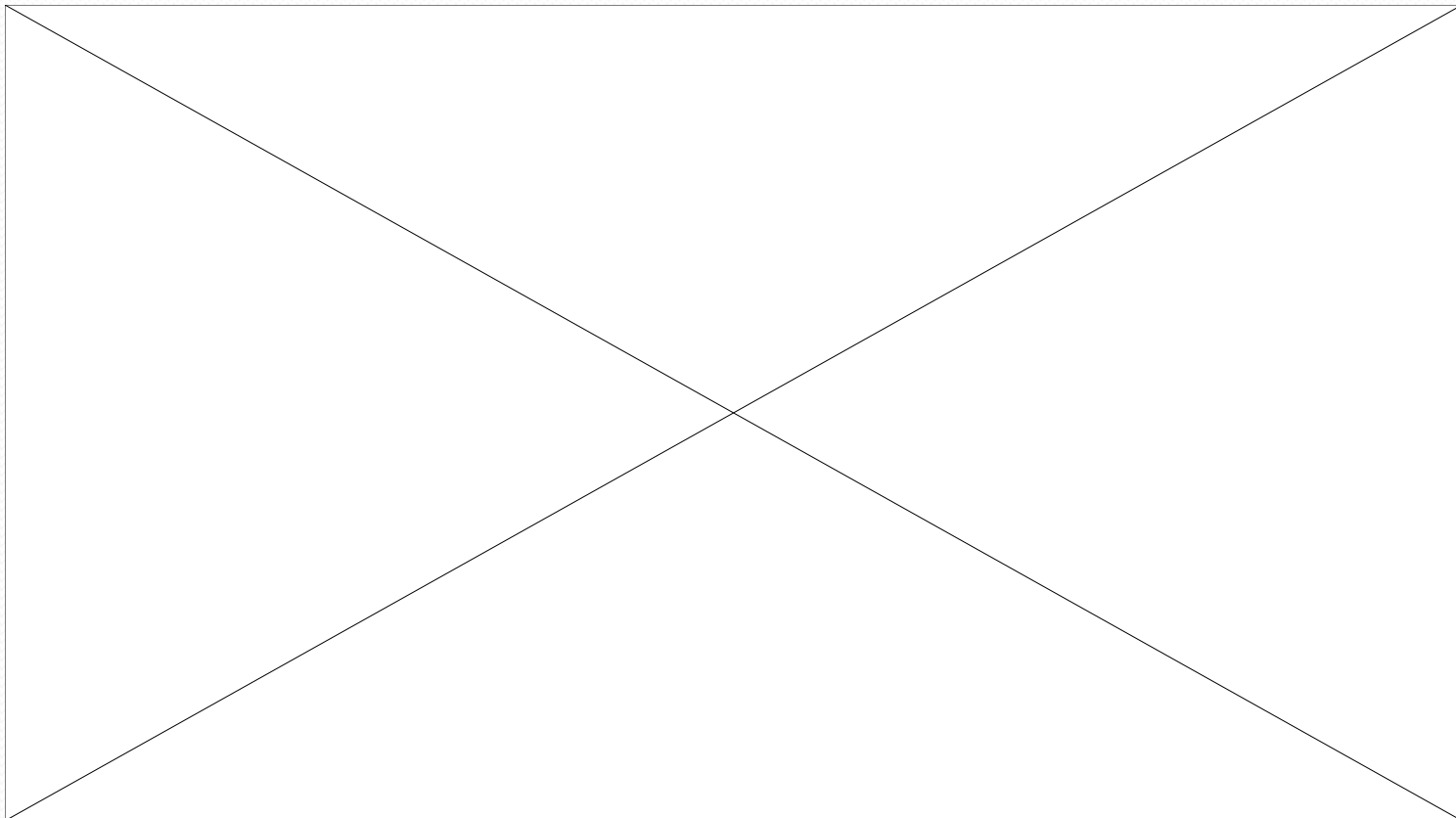
Private Google Earth - Using the KML

- Once the KML file is downloaded it can be opened in the Google Earth application to get the real-time data anytime.
- This is just a one time process



Public Google Earth - without KML

- The best approach would be to have the real time data available in public Google Earth stand alone application.
- Data will be visible to entire world.
- No need for a KML file.



Public Google Earth - Available Options

Posting the KML through Google Earth Community



Alternatively, publish through Google Earth content providers like NOAA



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Advantages Of The New Methodology

- ✓ Easier accessibility
- ✓ Enhanced readability
- ✓ Larger audience
 - ✓ Visible to all over the internet.
- ✓ User friendly
- ✓ Increased relevance of data for a layman.
- ✓ Simple
 - ✓ No Matlab files, etc



Thank you!!!