

Toward Interoperability

Data Partnership Annual Meeting

December 2005

Philip Bogden

Gulf of Maine Ocean Observing System (GoMOOS)

Standards Enable Innovation

The April 2004 Perspective:

- WWW → HTTP & HTML

Standards Enable Innovation

April 2004 Perspective:

- WWW → HTTP & HTML
- Meteorology → OPeNDAP + CF
- IOOS → OPeNDAP + ???
- OBIS → DiGIR + Darwin Core II
- EPA → HTTP + XML
- OGC → HTTP + XML

Welcome to www.OpenIOOS.org ...where standards enable innovation

This interoperability demonstration represents a coastal sciences community effort. Our partners include several federal agencies and dozens of the top research universities in the country. We rely heavily on [Open Geospatial Consortium \(OGC\)](#) standards. To learn about the project, [click here](#) for answers to some frequently asked questions. For detailed project information visit [the project wiki](#).

Latest Real-time Observations

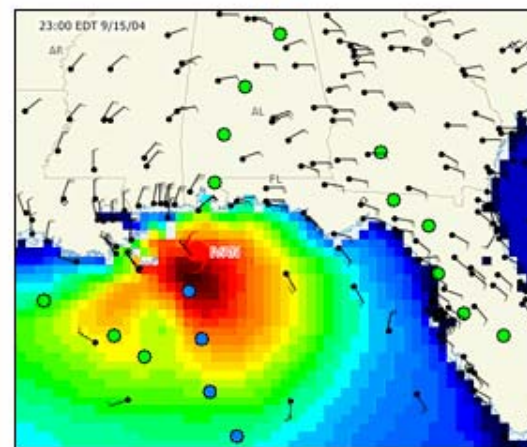
Sea Surface Temperatures from Buoys and Satellites
3:00 AM February 08, 2005 EST



Click map for interactive version

2004 Hurricane Retrospective

Showing Storm Tracks, In-Situ Observations, Satellite Imagery and Model Predictions



Samples from the 2004 hurricane season

Frances (8/24 - 09/6)

[Show animation](#)

[Go to map](#)

Ivan (9/2 - 9/24)

[Show animation](#)

[Go to map](#)

Jeanne (9/13 - 9/27)

[Show animation](#)

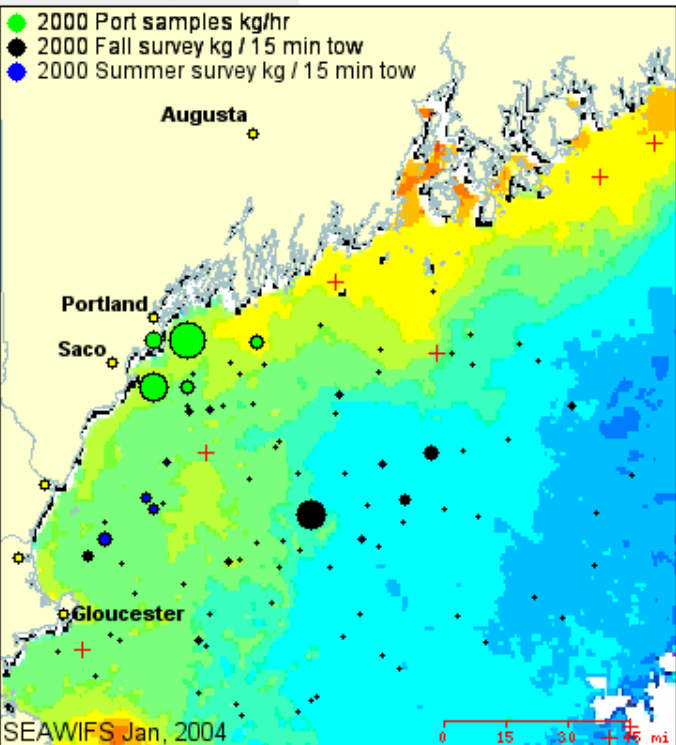
[Go to map](#)

Hurricane Ivan's approach to the Gulf coast showing predicted wave heights and observed winds.

Contributors



Northern Shrimp: [Interactive Map](#) | [Time Series Maps](#) | [Downloads](#) | [Project Overview](#)



[Data](#) | [Tools](#) | **[Layers](#)** | [Graphs](#) | [Legend](#)

Layers

- [Shaded relief](#)
- [Bathymetry \(background\)](#)
- [GOM Surficial geology](#)
- [Coastal Surficial geology](#)
- [Bathymetry \(contours\)](#)
- [Lat/Lon lines](#)
- [Summer survey strata](#)
- [Fall survey strata](#)
- [Statistical areas](#)
- [10 min. squares](#)

Satellite composites

- [Ocean color \(monthly\)](#) 2004 Jan
- [SST \(monthly\)](#) 2004 Jan

Models

- [Bottom temp.](#) 2004 Jan

Climatology

- [Temperature](#) Jan -Depth-
- [Salinity](#) Jan -Depth-
- None

[Update Map](#)

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Web Service

Definition:

Any service that is available over the Internet, uses a standardized XML messaging system, and is not tied to any one operating system or programming language.

Standards Enable Innovation

Real Dec 2005 Perspective:

- WWW → HTTP & HTML
- Meteorology → Web Services*
- IOOS → Web Services*
- OBIS → Web Services
- EPA → Web Services
- OGC → Web Services

Web Service Protocol Stack

Discovery

UDDI

Description

WSDL

Messaging

XML, XML-RPC, SOAP

Transport

HTTP, FTP, SMTP

World Wide Web (WWW) Protocol Stack

Messaging

HTML

Transport

HTTP

World Wide Web (WWW) with Discovery

Web sites provide discovery services

Discovery

Google, FGDC, GCMD,
GeoConnections

Top of the WWW Protocol Stack

Messaging

HTML

Transport

HTTP

Web Service Protocol Stack

Technology of Interoperable Access

Discovery

UDDI

Description

WSDL

Messaging

XML, XML-RPC, SOAP

Transport

HTTP, FTP, SMTP

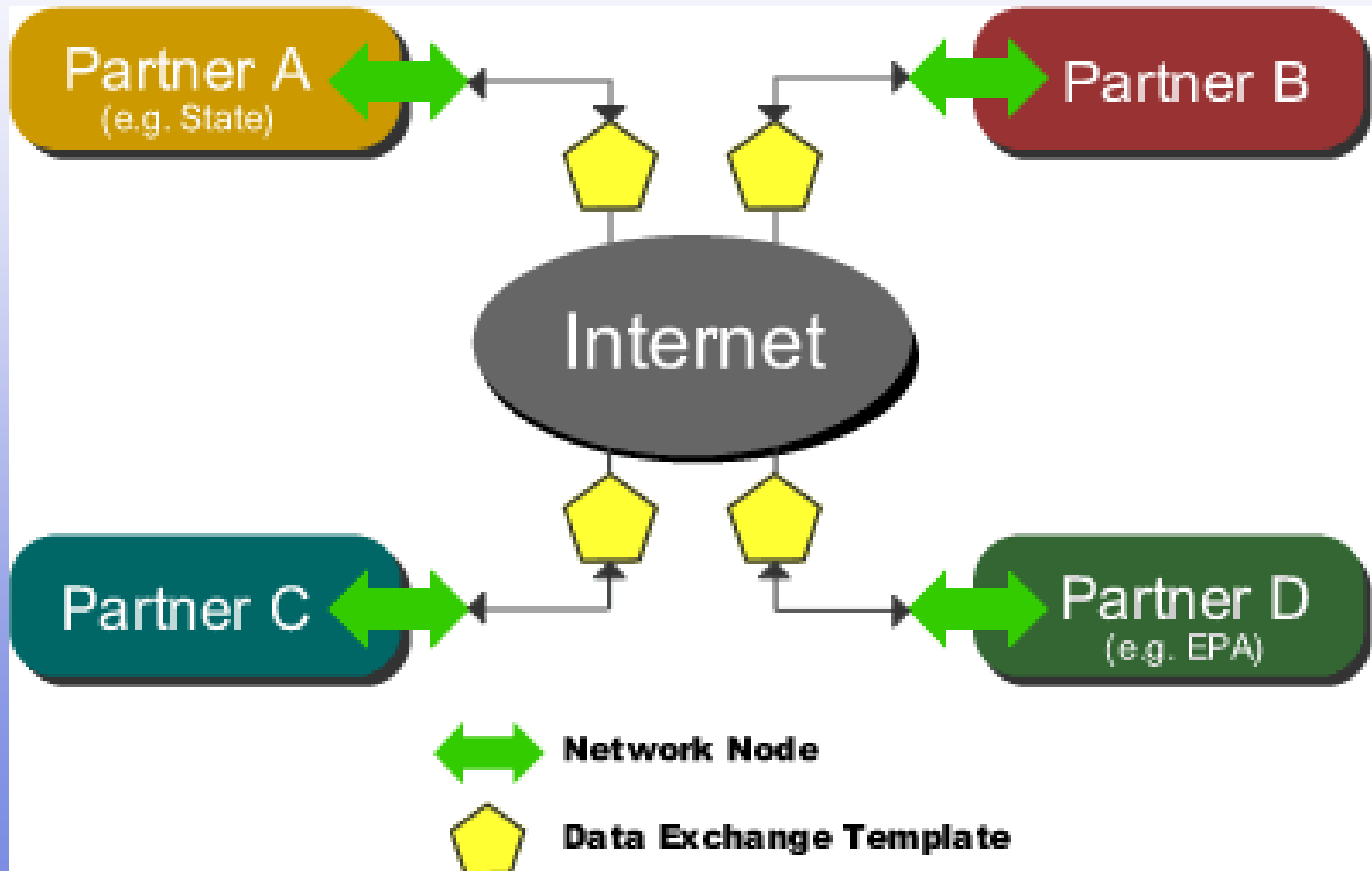
The Exchange Network

The power of the Network lies in the technology that “Nodes” use to transmit data among partners.

Extensible Markup Language, or XML, is an open standard that describes data through simple but rigid syntax rules. It provides a standards base from which anyone may exchange data regardless of computer system or platform. XML also takes data from disparate data sets and formulates a common meaning between them. In short, XML overcomes system incompatibility by translating information into a common data structure and format. With XML, existing data management systems remain in place and the data is transformed as it enters and exits each system without changing the meaning or appearance of the data

<http://www.exchangenetwork.net>

The Exchange Network Architecture



Service Oriented Architecture

- Accommodates Legacy Data Systems
- Independent of Operating System
- Independent of Programming Language
- Leverages Community (W3C) Standards
- Enables Interoperable Access
- Enables Community Standardization (e.g., OGC)
- Enables Incremental Service Evolution

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Work Plan Goals

- *Extend Discoverability*
- *Enable Authoritative Access*
- *Leverage/Extend Community Standards*
- *Begin Incremental Service Deployment*
- *Demonstrate & Document Progress*

Some Related Activities

OGC Interoperability Test Beds

www.GoMMaP.org & www.OpenIOOS.org

Marine Metadata Initiative (MMI)

www.MarineMetadata.org

SURA & OOS Tech 2005

Web services for interoperable ocean science