

# Web 2.0 in Air Quality Analysis and Management

Rudolf B. Husar and Erin M. Robinson  
Washington University, St. Louis, MO

## California Smoke Wiki Page



**Description: Drought and Santa Ana winds created "perfect fire" conditions in S. California**

- There is a wealth of information on the event dispersed over the Web
- This wiki is for capturing info resources on the smoke and its air quality impacts
- Users are encouraged to contribute and to **use the resources to analyze and learn**

Type: N/A | Pollution | Location: Southern California | Dates: October 22, 2007 - November 1, 2007 | Lat: 30, 38 | Lon: -130, -110

**Interested in the California Smoke Event? Please join us in harvesting web resources!**  
Please use the tag [071022SoCalSmoke](#) in [Del.icio.us](#), Flickr, Blogs, YouTube to identify Web resources  
Ideas, comments, questions? Contact [rhusar@me.wustl.edu](mailto:rhusar@me.wustl.edu) or [stefan@wustl.edu](mailto:stefan@wustl.edu)

2007 National Environmental Information Symposium

St. Louis, MO, November 15-17, 2007

# Web 2.0 and Environmental Protection

- The Web is being transformed: It is becoming more participatory
- Its content is increasingly generated and distributed by individuals
- See the explosive growth of wikies, picture-sharing, blogs, Facebook
- This architectural, technological and cultural change is [Web 2.0](#)
- Web 2.0 is good for environmental protection community since it allows
- Harvesting of current and the collaborative creation new knowledge.

# Wiki as Workspace - DataFed Wiki

**DataFed Wiki**

This wiki is the collaboration workspace for the federated data system **DataFed**

DataFed provides **standard interfaces** to heterogeneous distributed air quality data | Aids data analysis with **web services and tools**  
Gathers user-provided **metadata and feedback** | Fosters transition to service oriented, networked, system-of-systems IS architecture

**Catalog and Data Access**

**Presentations**

**DataFed Data Blog (See All...)**

- 2007-10-25: DataFed Dataset List with Tags
- 2007-09-14: Saving Intermediate Data
- 2007-09-05: Solta Console
- 2007-06-25: US Ozone Forecast NOAA
- 2007-06-02: OMI on GoogleEarth
- 2007-05-30: Emissions Datasets

**DataFed R/D Blog (See All...)**

- 2007-11-08: Google Scholar Tagging Method
- 2007-10-25: DataFed Dataset List with Tags
- 2007-10-08: HTAP Model Comparison
- 2007-10-08: Grid-to-Point Extraction Service
- 2007-09-14: Saving Intermediate Data
- 2007-09-11: Syndication Oriented Architecture

**Projects (See All...)**

- Virtual Workgroups
- SHAirED
- NEISGEI
- FASTNET
- Coarse Particle Characterization
- CATT

**Sponsors**: NSF, NASA, OGC, ESIP, XML, SOA

**Report Presentations**

This page is for listing presentations about DataFed and related topics. Use the textbox below to enter the presentation title. Clicking Register Presentation button creates and opens a new page, properly labeled and tagged. Fill in the form and the links at the top of the page. *Add | SPRA HTAP*

Add Presentation

	Date	Location
2007-12-15 AGU San Francisco ExceptEvent	2007-12-15	San Francisco
2007-12-15 AGU Presentation Web 2.0	2007-12-15	San Francisco, CA
2007-11-01 Energy-Environment Analysis Framework	2007-11-01	St. Louis
2007-10-16 Forschungszentrum Juelich Seminar	2007-10-16	Juelich, Germany
2007-09-10 GEOSS Africa Fire Pilot	2007-09-10	Africa
2007-07-25 IGARSS07 Barcelona	2007-07-25	Barcelona, Spain
2007-07-22 GEOSS System and Interoperability Demo	2007-07-22	Barcelona, Spain
2007-07-22 GEOSS Arch BarcelonaDemo	2007-07-22	
2007-07-18 ESIP Demo GA Smoke	2007-07-18	Madison, Wisconsin
2007-07-18 ESIP Demo OMI NO2	2007-07-18	Madison, Wisconsin
2007-06-05 GEOSS Architecture Pilot	2007-06-05	Frascati (Rome), Italy
2007-05-20 Web2.0 and Mashup Unidata e-le	2007-05-20	Unidata
2007-04-16 EGU Mtg Vienna	2007-04-16	Vienna, Austria
2007-01-25 HTAP Mtg Geneva	2007-01-25	Geneva, Switzerland

**2007-07-22: GEOSS Arch BarcelonaDemo**

Barcelona Demo Wiki - This Workspace is dormant after the Demo

Sahara Dust and Ocean Productivity Over the Mediterranean

Participants: See more...

**What's New**

- 2007-07-14: Scenario Version 4 - Final
- 2007-07-10: Scenario Version 3
- 2007-07-08: Scenario Version 2
- 2007-07-06: Scenario Version 1
- 2007-07-03: NASA GIOVANNI Data being linked both directions
- 2007-07-02: Surface Dust monitoring data federated
- 2007-06-30: All data accessible through Google Earth client
- 2007-06-13: BSC Dust Model federated
- 2007-05-21: Initial dust datasets collected
- 2007-05-21: Wiki workspace created
- 2007-05-13 - 17: Demo participation increased
- 2007-05-10: Initial demo coordination began

**Schedule**

- 07-05-10 GWVS Telecon @
- 07-05-15 Scenario selection, Dataset Identification
- 07-05-24 GWVS Telecon
- 07-06-13 GWVS Telecon @
- 07-06-15 Service Workflow Testing
- 07-07-06 GWVS Telecon @, Slides distributed
- 07-07-20 Scenario Recorded and Tested
- 07-07-21 On-site Demo Test
- 07-07-22 Demo Barcelona GEOSS

**Demo Outline**

- GEOSS Workshops
- GEOSS Interoperability Demo

**Demo Discussion**

- Leptokih, July 2
- May 24 Telecon
- Barcelona Demo - Contact with

**Demo Datasets**

- Demo Datasets by Virtual Workgroup
- DREAM Dust Forecast Model - Carlos Perez, Barcelona

# Community Data Sharing - 'DataSpaces'

## Catalog - Find Dataset

The screenshot shows the 'DataFed Compact Catalog' website. It features a navigation menu on the left with options like 'Main Page', 'Community portal', and 'Recent changes'. The main content area displays a list of datasets, each with a thumbnail, a title, and metadata. The datasets listed are:

- AIRNOW: Surface Monitoring Data for PM2.5 and Ozone** (Domain: Aerosol | DataType: POINT | Platform: Network | Method: Point) | Provider: EPA
- AQS: AQS** (Domain: Aerosol | DataType: POINT | Platform: Network | Method: Point) | Provider: PSWC
- CALIPSO: CALIPSO Lidar Browse Images** (Domain: Aerosol | DataType: Image | Platform: Satellite | Method: RemoteSens) | Provider: NASA
- EDGAR: EDGAR Emission Data** (Domain: Emission | DataType: GRID | Platform: Emission | Method: RemoteSens) | Provider: EDGAR
- EMC Model: EMC\_Model** (Domain: Aerosol | DataType: Seq/Image | Platform: Model | Method: Model) | Provider: [No\_Source\_URL NOAA]

## Describe Dataset

The screenshot shows the 'AIRNOW' dataset description page. It includes a title 'AIRNOW - Surface Monitoring Data for PM2.5 and Ozone', a description of the program, a map of the United States showing monitoring stations, and sections for 'User-provided Metadata', 'Websites', and 'Papers'. A pink arrow points from the 'AIRNOW: Surface Monitoring Data for PM2.5 and Ozone' entry in the catalog to this page.

## Discuss Dataset

The screenshot shows a discussion thread titled 'Talk: AIRNOW'. The thread discusses the time zone for the stations data in the AIRNOW dataset. The main post asks: 'In the AirNOW dataset that is accessible through DataFed, what is the time zone for the stations data?'. A reply from KBenedict states: 'The time zone depends on the OBS file and is specified in the header (TZONE). The example you linked below is in EDT.' Another reply from SRaffuse adds: 'Quite impressive instant gratification. I'm amazed. Is there anything we can do to help at this point? I'm not sure that normalization'.

Earth Science Information Partners (ESIP)



# Communal Event Analysis Southern California Fire Smoke

## 071022SoCalSmoke



**Description:** Drought and Santa Ana winds created "perfect fire" conditions in S. California

- There is a wealth of information on the event dispersed over the Web
- This wiki is for capturing info resources on the smoke and its air quality impacts
- Users are encouraged to contribute and to **use the resources to analyze and learn**

Type: N/A | Pollution | Location: Southern California | Dates: October 22, 2007 - November 1, 2007 | Lat: 30, 38 | Lon: -130, -110

### Interested in the California Smoke Event? Please join us in harvesting web resources!

Please use the tag [071022SoCalSmoke](#) in [Del.icio.us](#), [Flickr](#), [Blogs](#), [YouTube](#) to identify Web resources  
Ideas, comments, questions? Contact [rhusar@me.wustl.edu](mailto:rhusar@me.wustl.edu) or [stefan@wustl.edu](mailto:stefan@wustl.edu)

### Science-Oriented Websites

[edit]

### Aerosol and Smoke Forecasts

[edit]

Smoke forecast are now being performed by diverse approaches, including chemical transport models that assimilate fire observations and forward trajectory models. In the resource table below the smoke forecast are available as quantitative datasets that can be browsed and analyzed. The additional links below point to forecasting presented through their respective, dedicated interfaces.

DatasetTitle	ProviderAbbr	Data Type	SampleMethod
AIRNOW	EPA	POINT	Point
EMC Model	NOAA	SeqImage	Model
GOCART G OL	NASA	GRID	Model
NAAPS GLOBAL	NRL	Image	Model
NAAPS NoAm	NRL	Image	Model

### Web pages to smoke forecasts, tagged as 071022SoCalSmoke Forecast:

[USFS BlueSky/CMAQ California Predictions](#) Experimental smoke prediction page from USFS/STI/DR/NASA/NOAA. 26 October 2007, by raffscallion

[IDEA - Infusing satellite Data into Environmental Applications](#) 26 October 2007, by rhusar

### Aerosol and Smoke, NearRealTime

[edit]

DatasetTitle	ProviderAbbr	Data Type	SampleMethod
AIRNOW	EPA	POINT	Point
CALIPSO	NASA	Image	RemoteSens
GASP	NOAA	SeqImage	Model
GASP tiff	NOAA	SeqImage	Model
GDSG Fire	NOAA	Image	RemoteSens
GOCART G OL	NASA	GRID	Model
MOPITT Day	NCAR	Image	RemoteSens
NOAA HMS WFS	NOAA	POINT	RemoteSens
OMI AI G	NASA	GRID	RemoteSens
OnEarth JPL	NASA	SeqImage	RemoteSens
SURF MET	PSWC	POINT	Point
SURF MET WIND	PSWC	POINT	Point

[Interagency real time smoke monitoring](#) 29 October 2007, by sirf\_dsc

[Fire Hazard Mapping System - Satellite Services Division](#) 24 October 2007, by rhusar

### YouTube Videos

[edit]

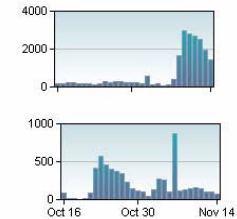
List of selected videos from YouTube.



<http://www.youtube.com/larryesp>

### Blogs

Posts that contain [California Fire](#) per day for the last 30 d



POWERED BY Technorati

Google Blog Search: [California Fire Smoke](#)

### Near Real time Data Console



### Google Searches

- Google News Search: [California Fire Smoke](#)
- Google Image Search: [California Fire Smoke](#)
- Google Web Search: [California Fire Smoke](#)

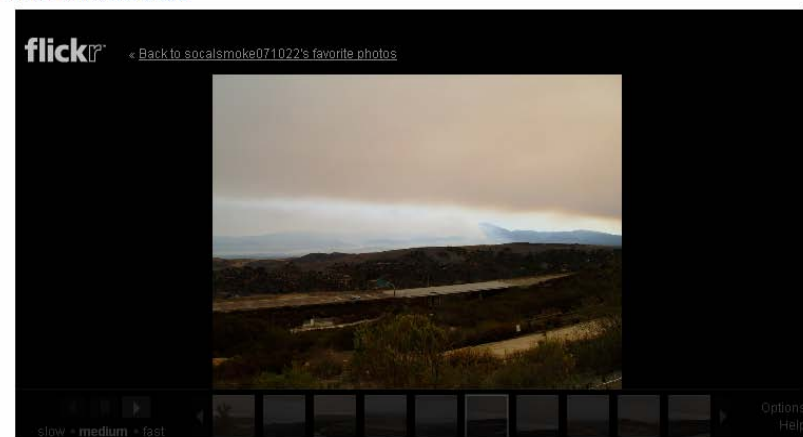
### Flickr Images

- Flickr Images Search: [California Smoke, after Oct 21, 2007](#)

The image collection below is a subset of smoke pictures extracted from the above particular interest to smoke pattern, transport and color.

- Flickr Favorites [Slide Show](#)

### Web Harvesting for 'California Smoke'

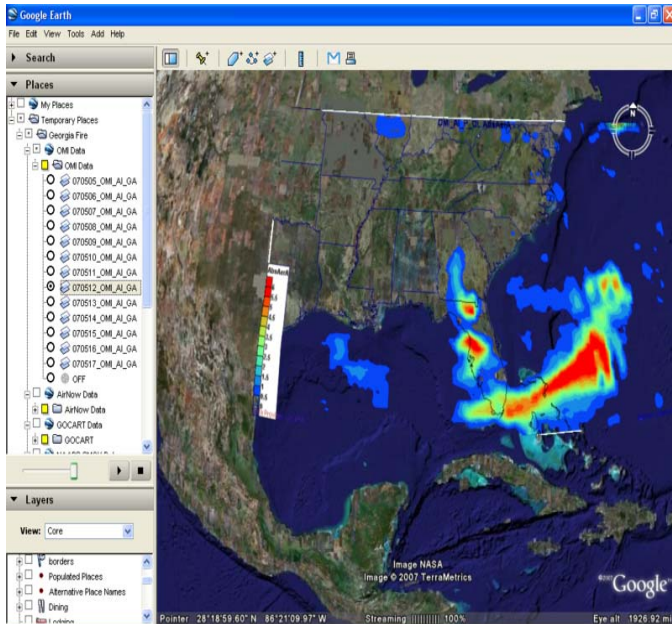


Username: [SoCalSmoke071022](#) PW: [071022SoCalSmoke](#)

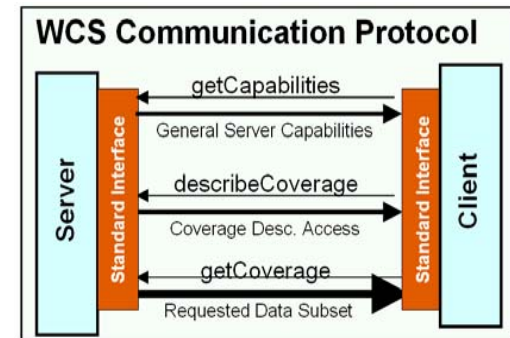
[NOAA-NESDIS GOES animation](#)

# Service Oriented Architecture



- The tools and methods of quantitative analysis are also changing.
- Monolithic, 'do-it-all' software is giving way to chained web service modules.
- SOA lowers the entry resistance & fosters unanticipated, user-defined [mashups](#).
- Our SOA-based federated data systems, [DataFed](#) is a server/client for mashups



Mashups through  
Standard Interfaces



**WCS Data Query Language**

Query	GetData	Coding (Standards)
Where?	BBOX 	Geo Reference (OGC, ISO)
When?	Time 	Time Code (OGC, ISO)
What?	Temperature	Coverage Naming (CF)
Format	netCDF, HDF..	Data Format (OGC, CF, EOS)

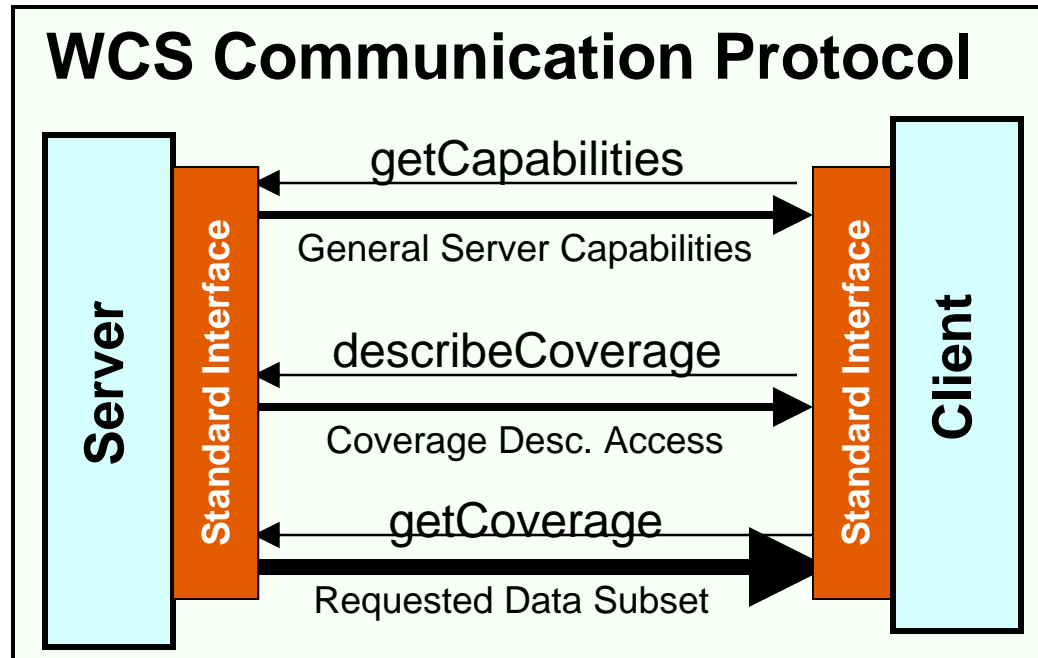
# Summary

- **The participatory web architecture and technologies are here**
- **The entry resistance to any particular Web 2.0 tool is rather low**
- **However, many cultural, legal and other barriers remain**
- **The challenge is to apply these tools for Environmental Protection**
- **The hands-on approach of The Puget Sound Challenge is an effective step toward the use of Web 2.0 tools Environmental Management.**

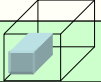



**Thank You!**

# Generic Data Interoperability



## WCS Data Query Language

Query	GetData	Coding (Standards)
<b>Where?</b>	BBOX 	Geo Reference (OGC, ISO)
<b>When?</b>	Time 	Time Code (OGC, ISO)
<b>What?</b>	Temperature	Coverage Naming (CF)
<b>Format</b>	netCDF, HDF..	Data Format (OGC, CF, EOS)