



ESIP Air Quality Workgroup and the GEO Air Quality Community of Practice

collaboratively building an air quality community network for
finding, accessing, understanding, and using shared information

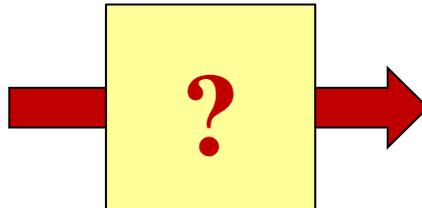
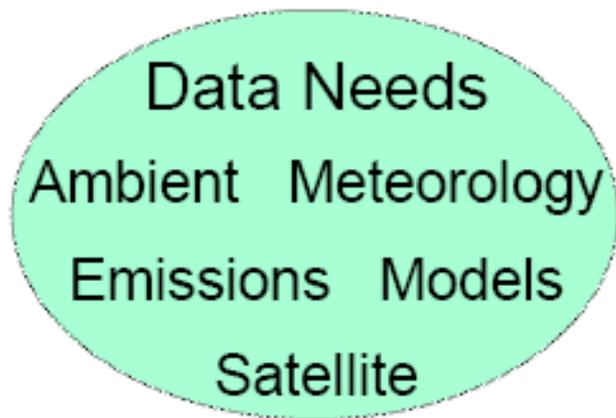
Presented by Stefan Falke
on behalf of the ESIP AQWG and GEO AQ CoP

Techniques in Air Quality Forecasting and Reporting in Countries Outside the United States
2010 National Air Quality Conferences

March 17, 2010

Distributed, Global Information Sources

Distributed, Global Decision Processes



Example Decision Makers

Policy maker assessing intercontinental transport

AQ manager assessing an exceptional event

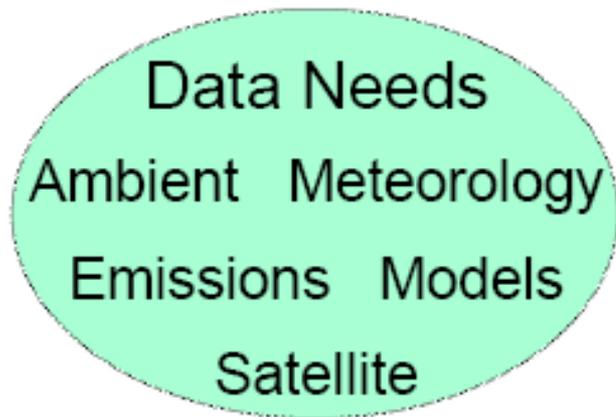
Public planning activities today and tomorrow

Decision-makers depend on common observations and data

Source: D. McCabe, T. Keating, EPA-OAR

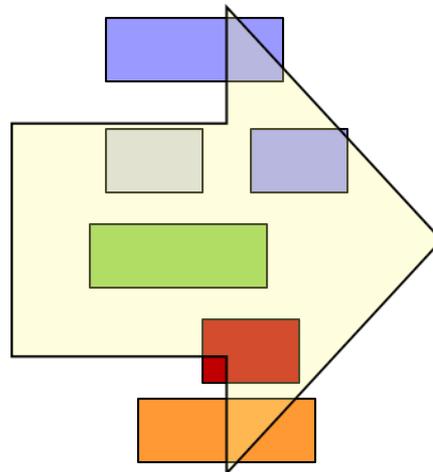
Distributed, Global Information Sources

Distributed, Global Decision Processes



*Decision-makers depend on
common observations and data*

Programs and Projects



Example Decision Makers

Policy maker assessing
intercontinental transport

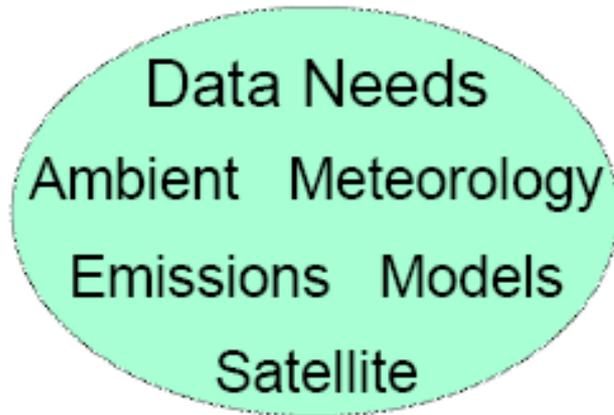
AQ manager assessing an
exceptional event

Public planning activities
today and tomorrow

**Dedicated programs/projects are designed for, and
serve, a specific purpose**

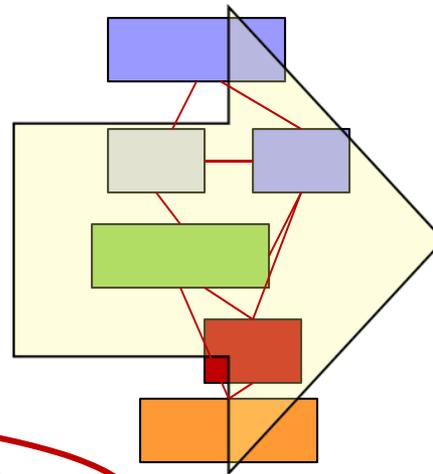
Distributed, Global Information Sources

Distributed, Global Decision Processes



Decision-makers depend on common observations and data

Programs and Projects



Example Decision Makers

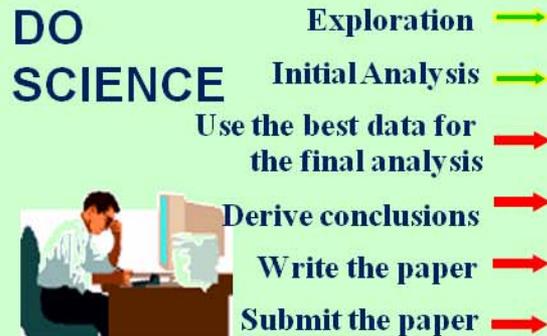
Policy maker assessing intercontinental transport

AQ manager assessing an exceptional event

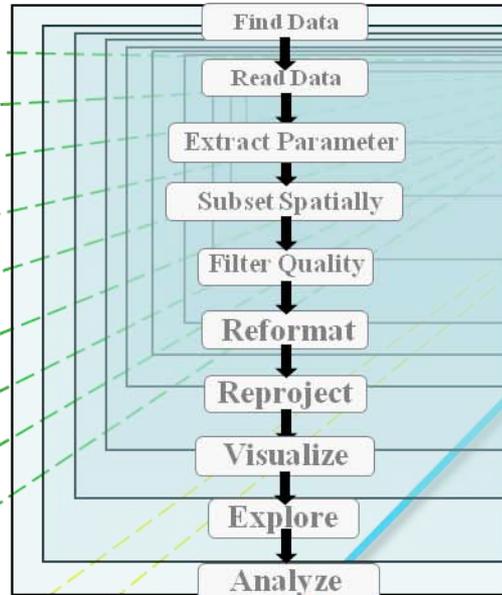
Public planning activities today and tomorrow

Together, programs/project can serve secondary purposes more effectively than each could on its own

The Old Way:



GEOSS Web-based Services:



The Services Way:



Services "Link-Rich" Environment Provides:
discovery, access, manipulation, visualization, and analysis.

Scientists have *more time to do science.*
 Decision makers rapid access to information

Courtesy: Gregory Leptoukh, NASA GSFC

Source: G. Leptoukh, NASA Goddard



ESIP:

Federation of Earth Science Information Partners

Primary Goals

- Increase the use and impact of Earth science data and information
- ... by leveraging existing and new technologies
- ... to make information accessible and usable to anyone who wants it

<http://www.esipfed.org>



ESIP:

Federation of Earth Science Information Partners

Consortium of 110+ Earth Science-Related Partners

- Type I (data centers)

- Type II (researchers & tool developers)

- Type III (application developers – commercial & nonprofit)

- Type IV (sponsors)

Formed in 1998 by NASA

- Funding: NASA, NOAA, and EPA

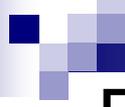
- With support from: USGS and NSF

Data- and technology-centric community

- Continuum of interests

- Neutral forum for community networking, collaboration & problem solving

- Limited (so far) international participation



ESIP:

Federation of Earth Science Information Partners

Activities

■ Technical

- Systems Interoperability (standards, metadata)
- Semantic Technologies
- Web Services
- Data Preservation and Stewardship
- Workshops

■ Societal Benefits

- Air Quality and Water (active)
- Energy and Climate (starting up)

■ Environmental Decision Making

- New
- Interdisciplinary
- Outreach to User Communities

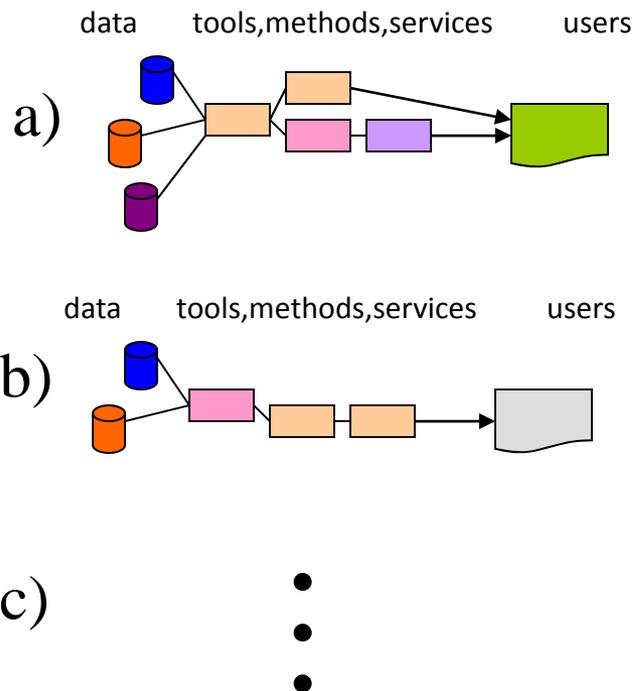
ESIP Air Quality Workgroup

The objective of the ESIP Air Quality Workgroup is to connect air quality data consumers with the providers of those data by:

- bringing people and ideas together on how to deliver Earth Science data to Air Quality researchers, managers and other users
- facilitate and demonstrate the information flow among data providers to air quality consumers

Community Building

brings together groups and helps ***build links*** among them in order to achieve an effective use of data in decision-making that could not be achieved by any organization acting on its own.



Technology Advancement

aids in ***reuse*** of data, processing tools and other services so that projects, programs and agencies avoid the end-to-end burden of developing those capabilities or having to create the connections themselves.

A Global Earth Observation System of Systems (GEOSS)

The Group on Earth Observations (**GEO**) is a partnership of 77 countries and 52 international organizations.

The GEO vision is to create **GEOSS** and realize coordinated, comprehensive, and sustained Earth observations and shared information among countries.

<http://www.earthobservations.org/>



The **GEO ten-year GEOSS plan (2005-2015)** defines the vision, purpose, and scope of the system, as well as nine demonstrable **“Societal Benefit Areas (SBAs)”** in disasters, health, energy, climate, water, weather, ecosystems, agriculture, and biodiversity.

This emerging infrastructure aims to interconnect a diverse and growing array of sensors and information systems to monitor, forecast, and assess changes in our global environment to support experts, policy makers, and decision makers.

A GEOSS Vision for Connecting Air Quality Programs/Projects

Observing and Modeling Systems

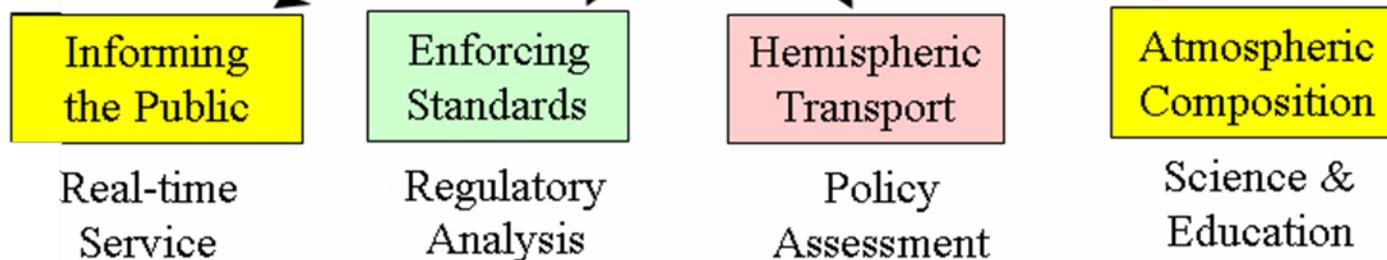
Unique Programs/Projects



Shared, Common Information Resources



Unique Programs/Projects

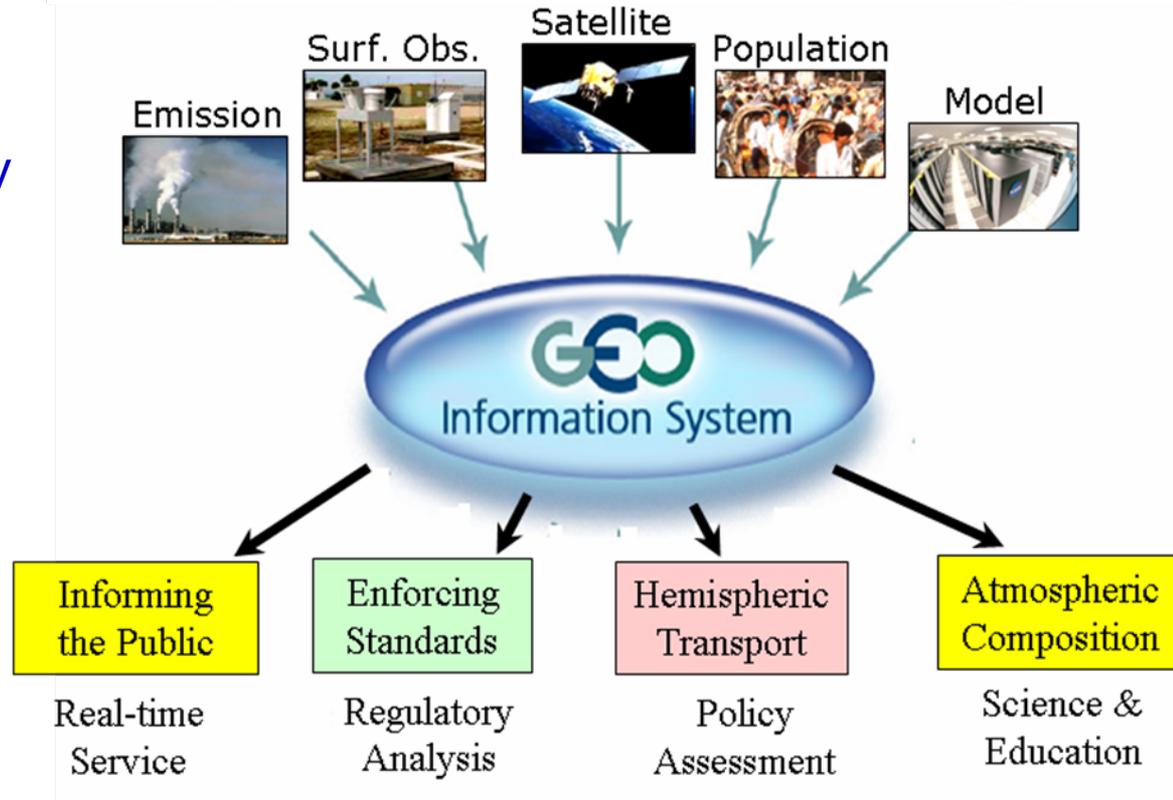


Air Quality & Health Applications

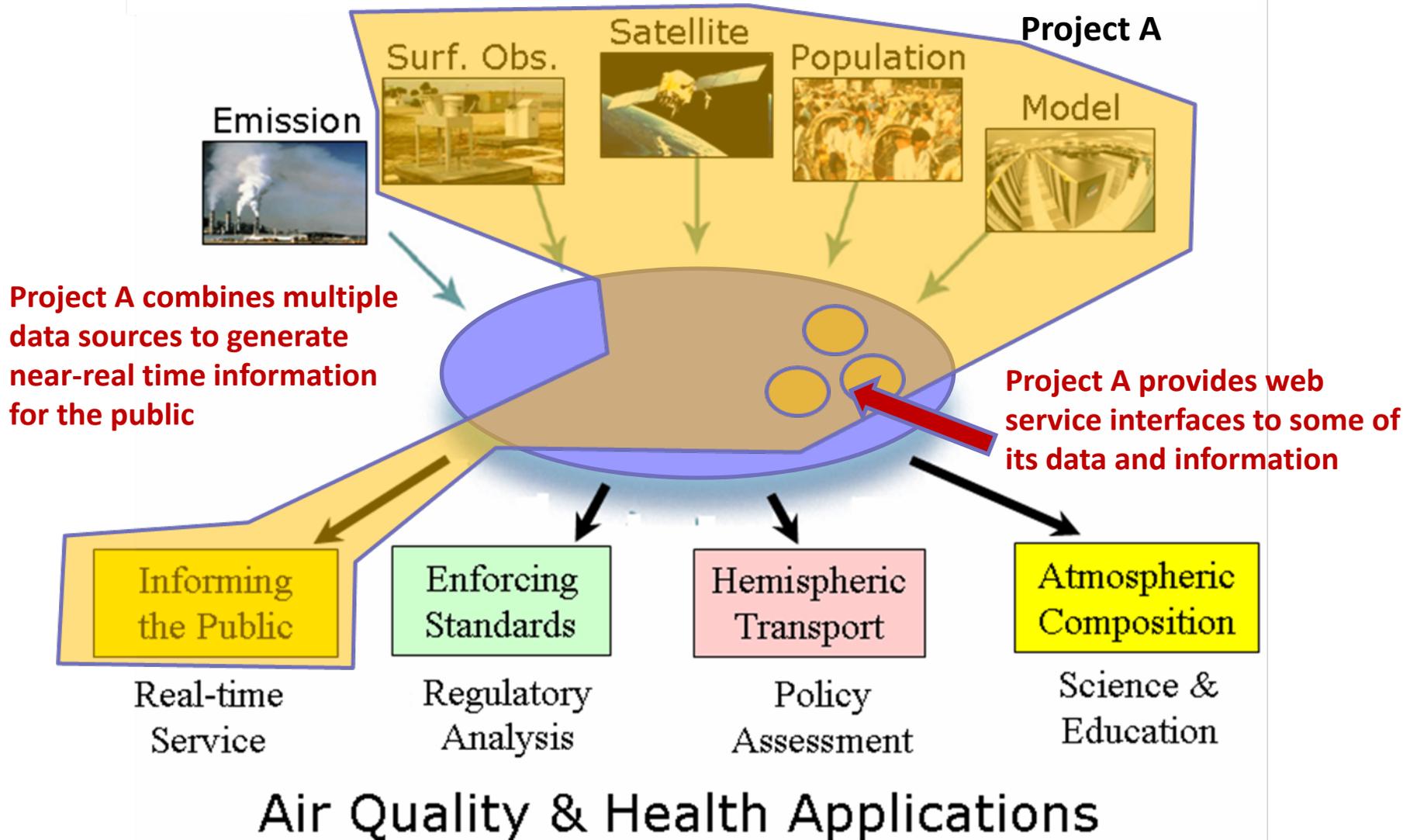
A GEO Air Quality Community of Practice (CoP) is forming to advance international air quality collaborations.

The AQ CoP aims to connect and enable air quality data providers and data users to benefit society using the GEO Process and GEOSS Infrastructure

Observing and Modeling Systems

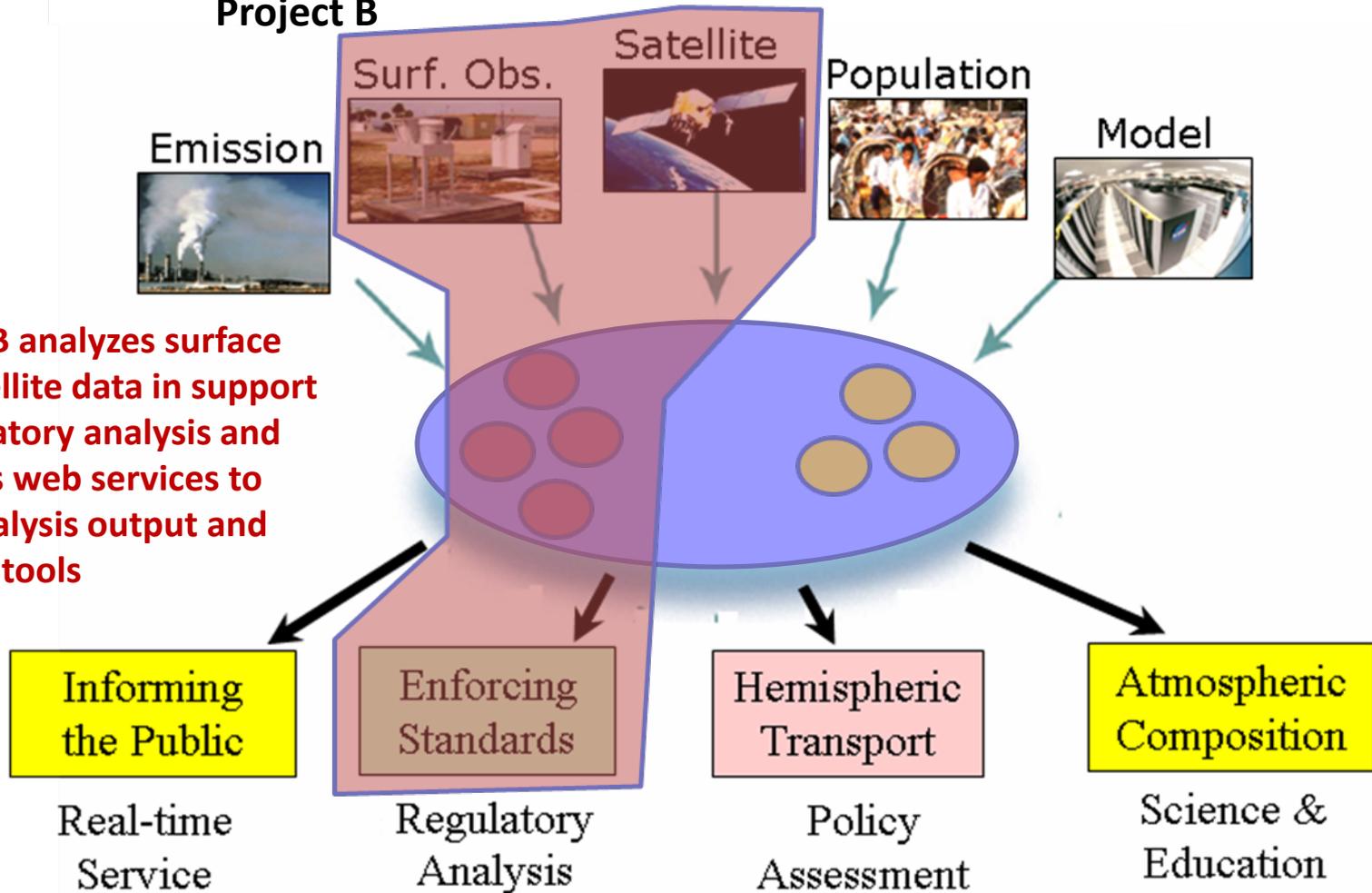


Observing and Modeling Systems



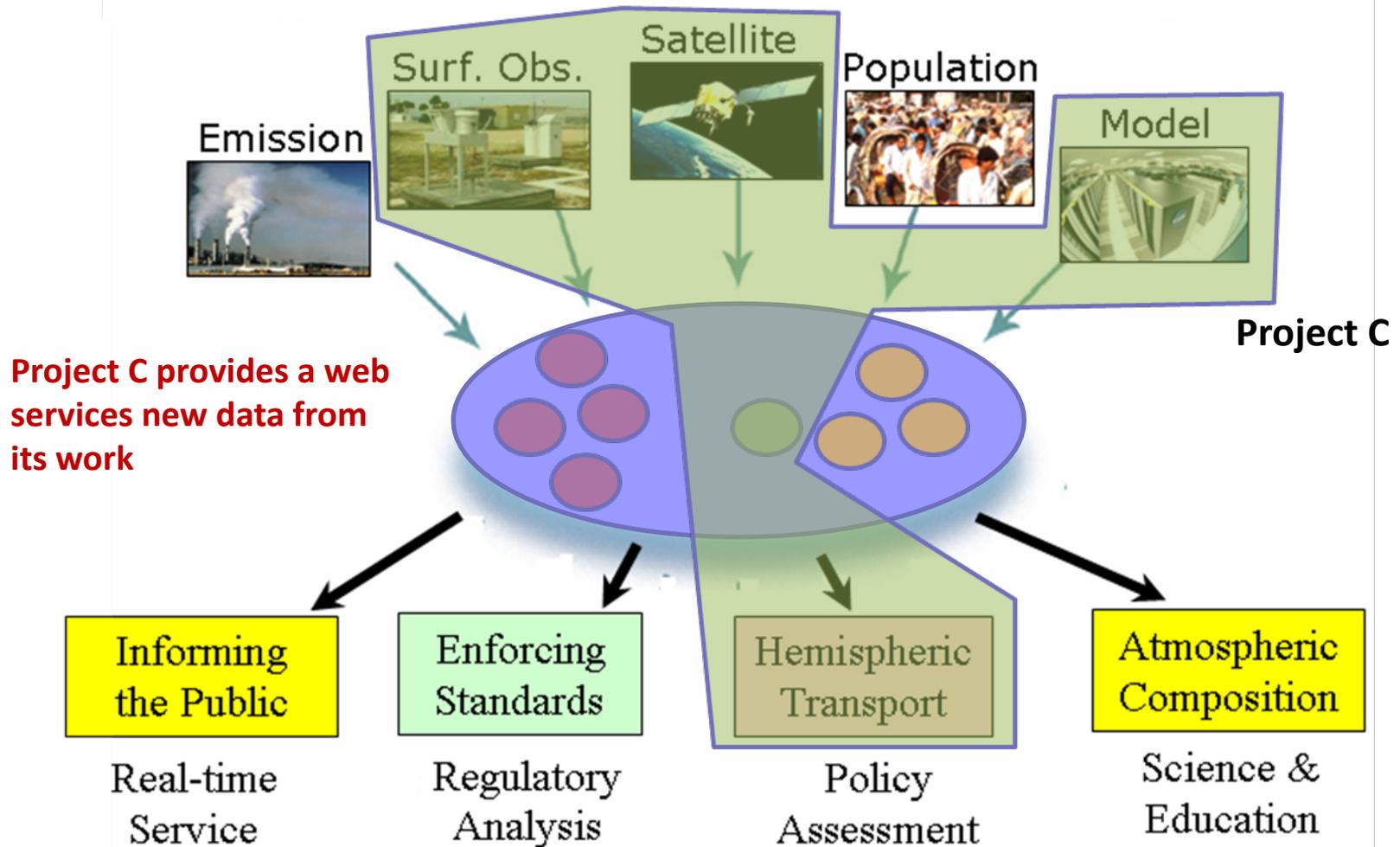
Observing and Modeling Systems

Project B

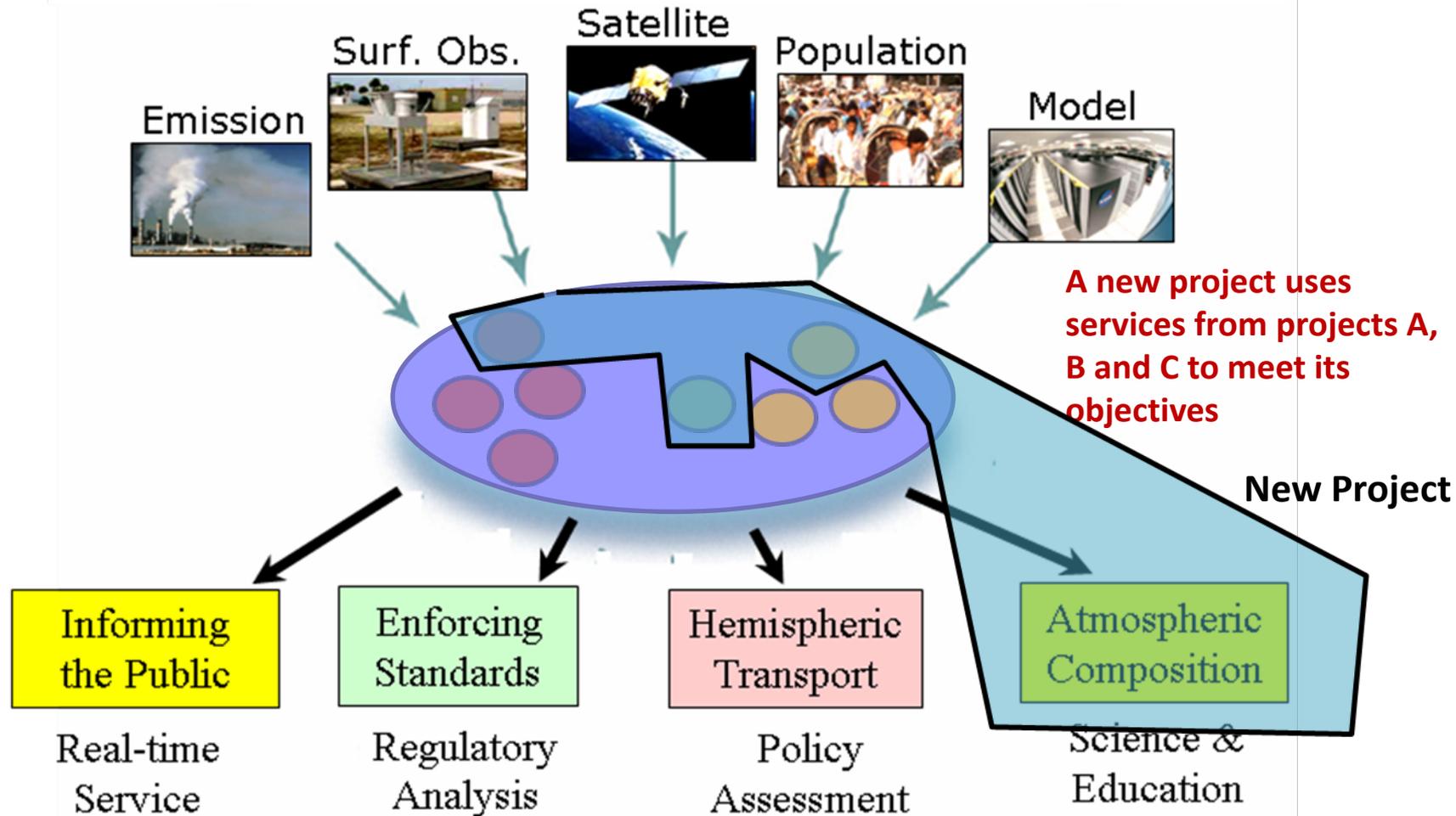


Project B analyzes surface and satellite data in support of regulatory analysis and provides web services to their analysis output and analysis tools

Observing and Modeling Systems



Observing and Modeling Systems



GEO AQ Community of Practice Goal

Support the development of a

Functioning AQ System of Systems by 2015

By Connecting and Enabling

Use of Earth Observations
Tools & Methods for Data
Sharing Practical Knowledge

AQ
Community

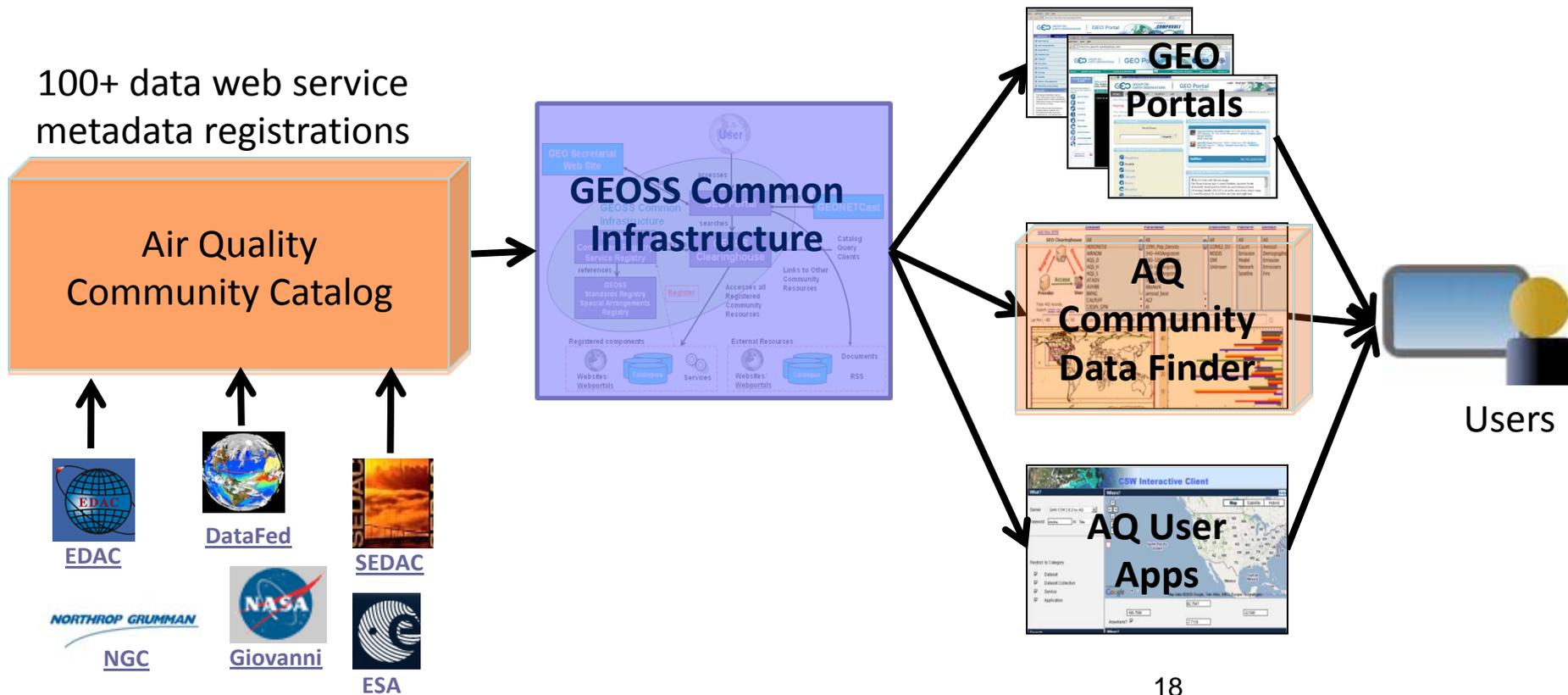
AQ Community of Practice

GEO
Process

AQ CoP and the GEOSS Infrastructure

AQ CoP Contributions to GEOSS GCI through the Architecture Implementation Pilot (AIP)

Air quality Community Catalog
AQ Community Data Finder
Developed Discovery Metadata for Air Quality



Example for finding and browsing AQ Data in GEOSS

GEOSS
Common
Infrastructure

GEOSS Registry

GEOSS Clearing-house

Search for AQ data

Return AQ metadata

[Add New WMS](#)

Dataset	Parameter	Instrument	Platform	Domain
All	All	All	All	All
AERONETd	1990_Pop_Density	GOME2_O3	Count	Aerosol
AIRNOW	340-440Angstrom	MODIS	Emission	Demographi
AQS_D	380-500Angstrom	OMI	Model	Emission
AQS_H	440-675Angstrom	Unknown	Network	Emissions
AQS_S	440-870Angstrom		Satellite	Fire
ATADV	500-870Angstrom			
AVHRR	AbsAerA			
BMNG	aerosol_bext			
CALPUFF	AGf			
CIESIN_GPW	AI			

Total 462 records.
Export: [atom](#) [csv](#) [json](#) [xml](#)

Lat Min: -90 Max: 90

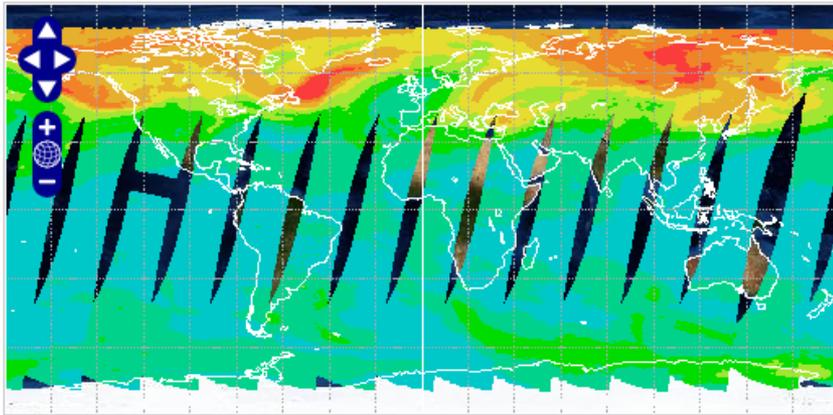
Lon Min: -180 Max: 180

Time Min: 1970-01-01 Max: 2009-10-26

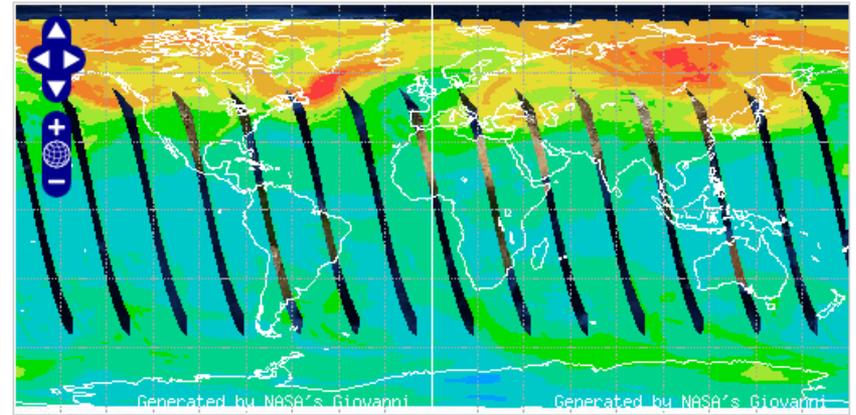
filtered AQ metadata available to other tools and applications

CEOS Atmospheric Composition Portal

O3 from GOME-2 (DLR) harmonized by Giovanni

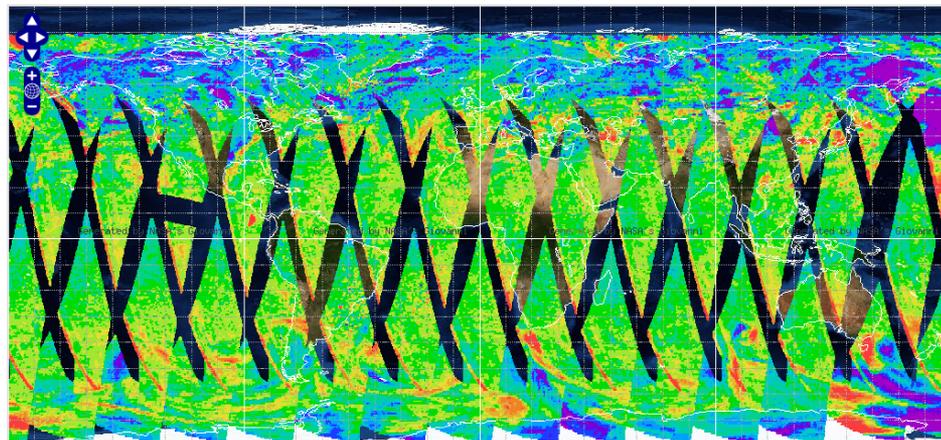


O3 from OMI (NASA)



Analyze difference

O3 GOME-2(DLR) - OMI(NASA) difference calculated by Giovanni



Interested in Participating or Learning More?

Community Building

- Share your interests and project contributions (like this session and conference)
- Describe your information and related needs to ESIP and GEO
- Use ESIP, GEO and other air quality communities of practice to advance your project objectives (e.g., 'built-in' testers, users; access to new information sources,...)
- Help define the GEOSS Community of Practice

Enhance the Information Infrastructure

- Become a 'node' on the air quality community network to share or use data
- Learn best practices in implementing standards for sharing your project data and tools
- Participate in (and shape) the GEOSS Architecture Implementation Pilot
- Use the AQ Community Information Architecture (register your services in GEOSS, find information resources useful for your project)
- Participate in the development of air quality information networks

Collaborate on AQ Science and Research Projects

- Define projects that leverage expertise and capabilities across organizations
- Document how data, information and capabilities are shared in the project

More Information

- ESIP at Booth #26

- Contacts:

- Carol Meyer, carolbmeyer@esipfed.org
- Stefan Falke, stefan.falke@gmail.com
- Erin Robinson, emr1@wustl.edu

http://wiki.esipfed.org/index.php/Air_Quality_Work_Group

Questions for Discussion

- What types of data do you use?
- What types of data would like to have access to that are currently not available or inaccessible to you?
- What do you do with the data you collect? (what's being done outside the regulatory framework - analysis, storage, reporting, dissemination, etc.)
- Do you 'repackage' your data for use by others?
- What system(s) are you using to work with your data?
- Do you work with any web services, web applications or web portals in finding or accessing data?
- Do you face any challenges in finding, accessing, understanding, or using data?
- Would you be willing to participate in a future focus group or the AQ working group (to help improve AQ data systems)?