

The Cyberinfrastructure for Atmospheric Composition and Air Quality: Status and Opportunities

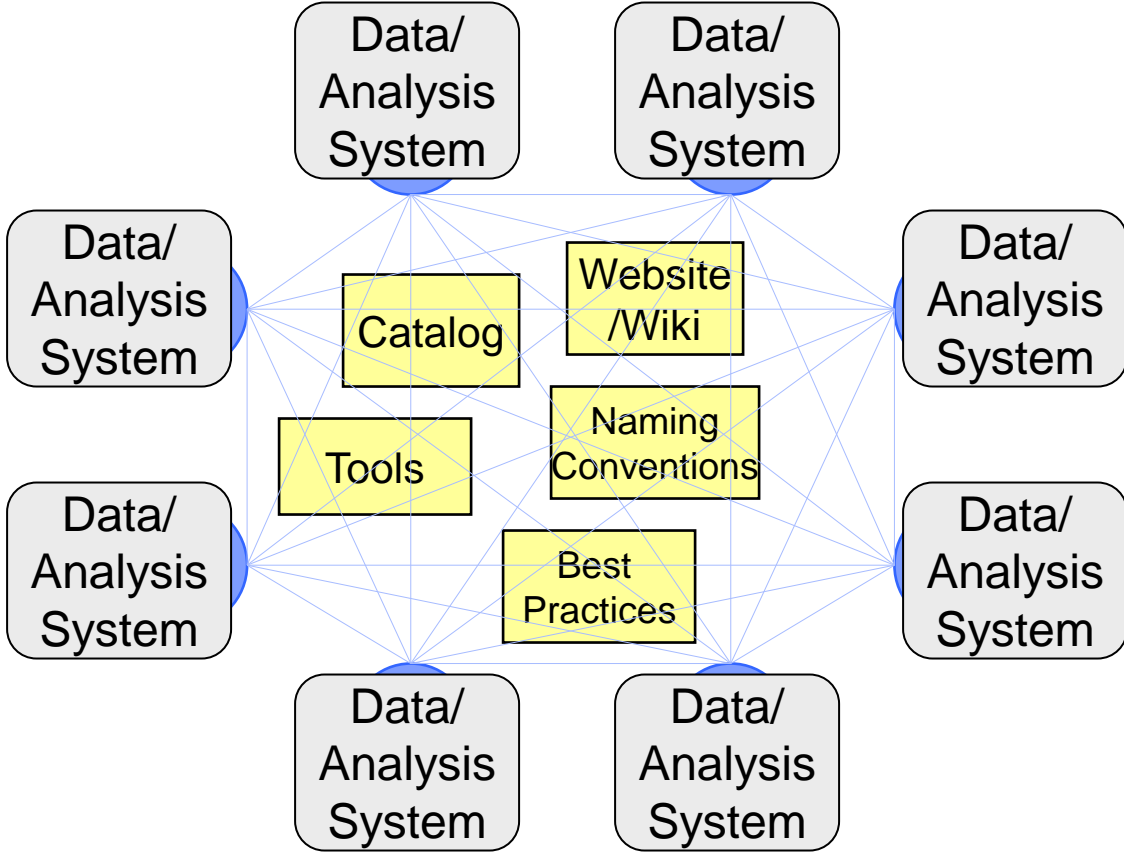
Terry Keating, PhD

US EPA Office of Air & Radiation

ESIP Winter Meeting

10 January 2014

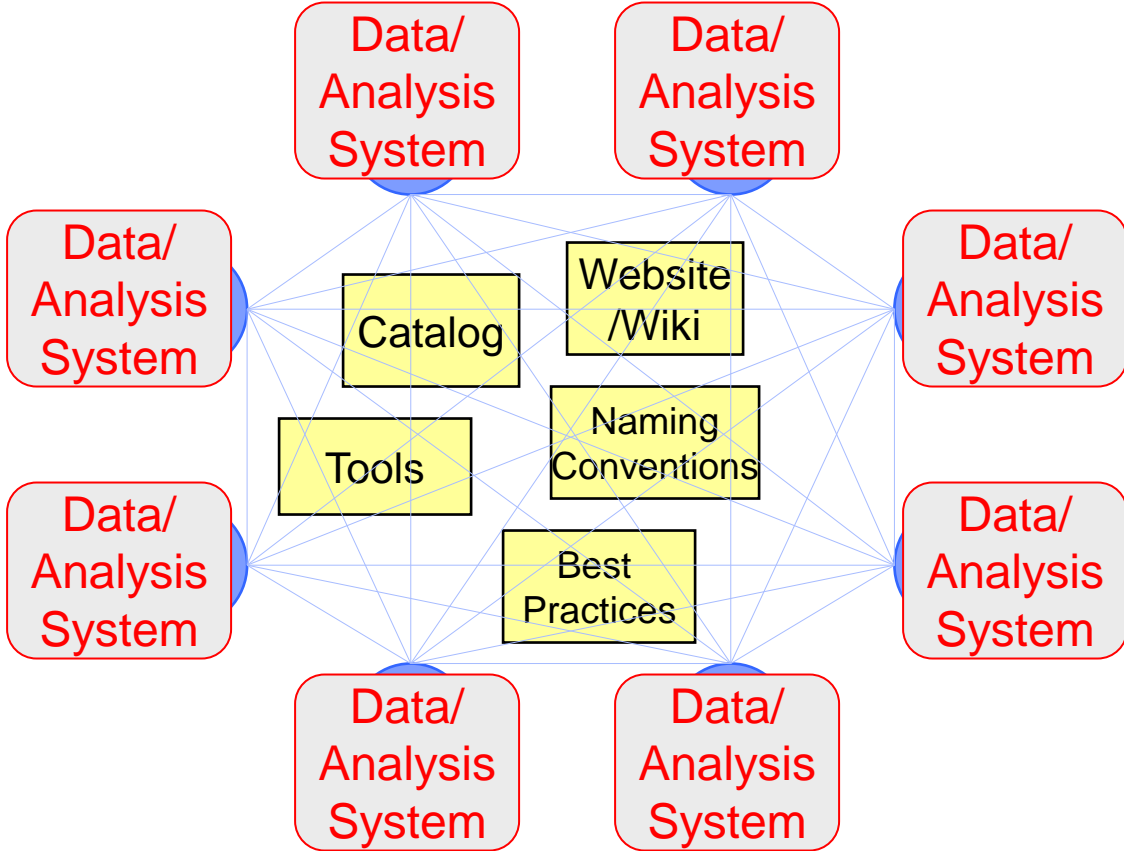
The Cyberinfrastructure Landscape



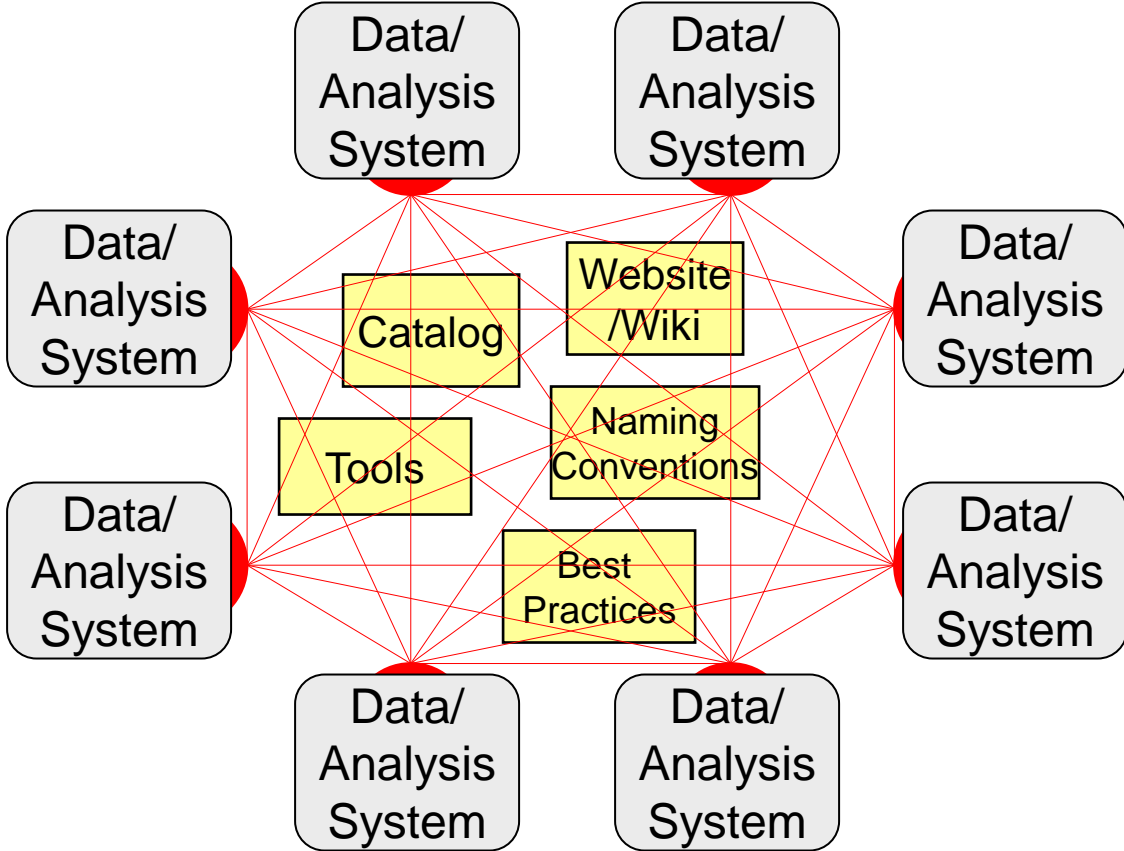
The Cyberinfrastructure Landscape

Nodes

- Data Providers
- Data Processors
- Data Users



The Cyberinfrastructure Landscape



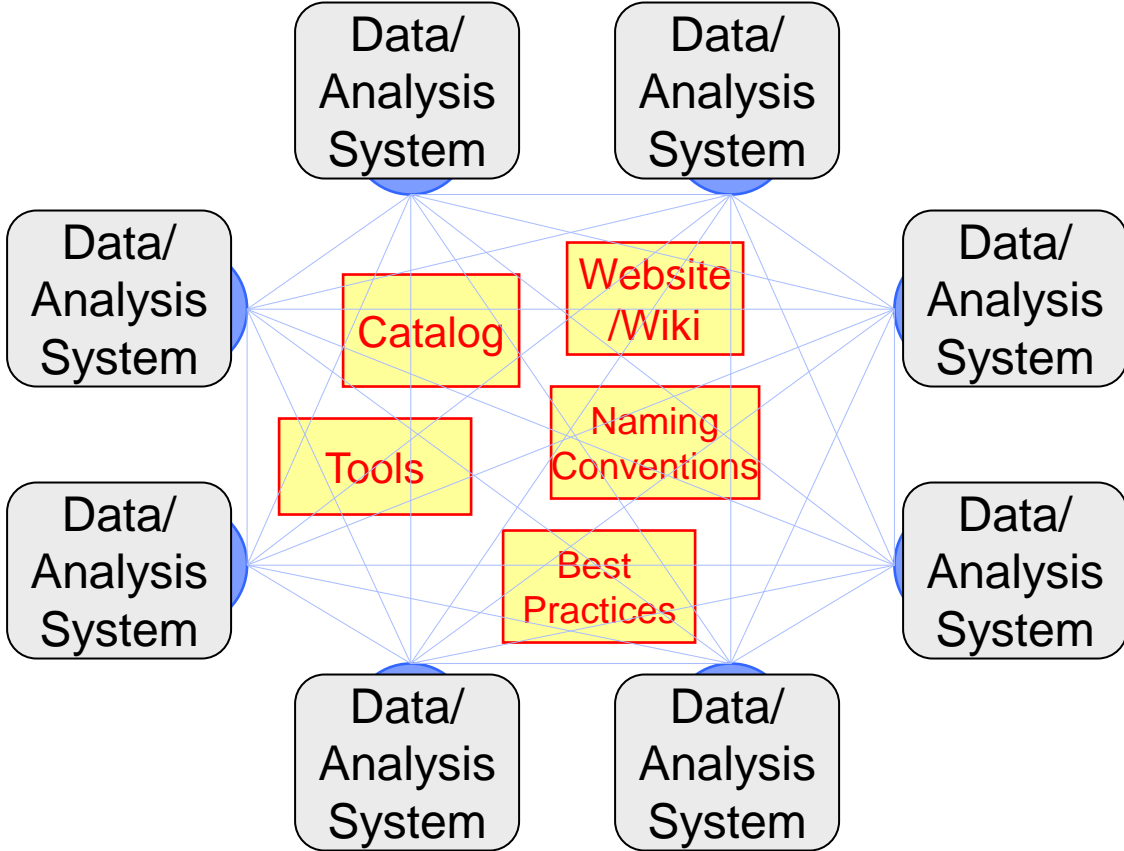
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Interface Components

- FTP/Exchange Formats
- Documentation
- MetaData
- Web Services

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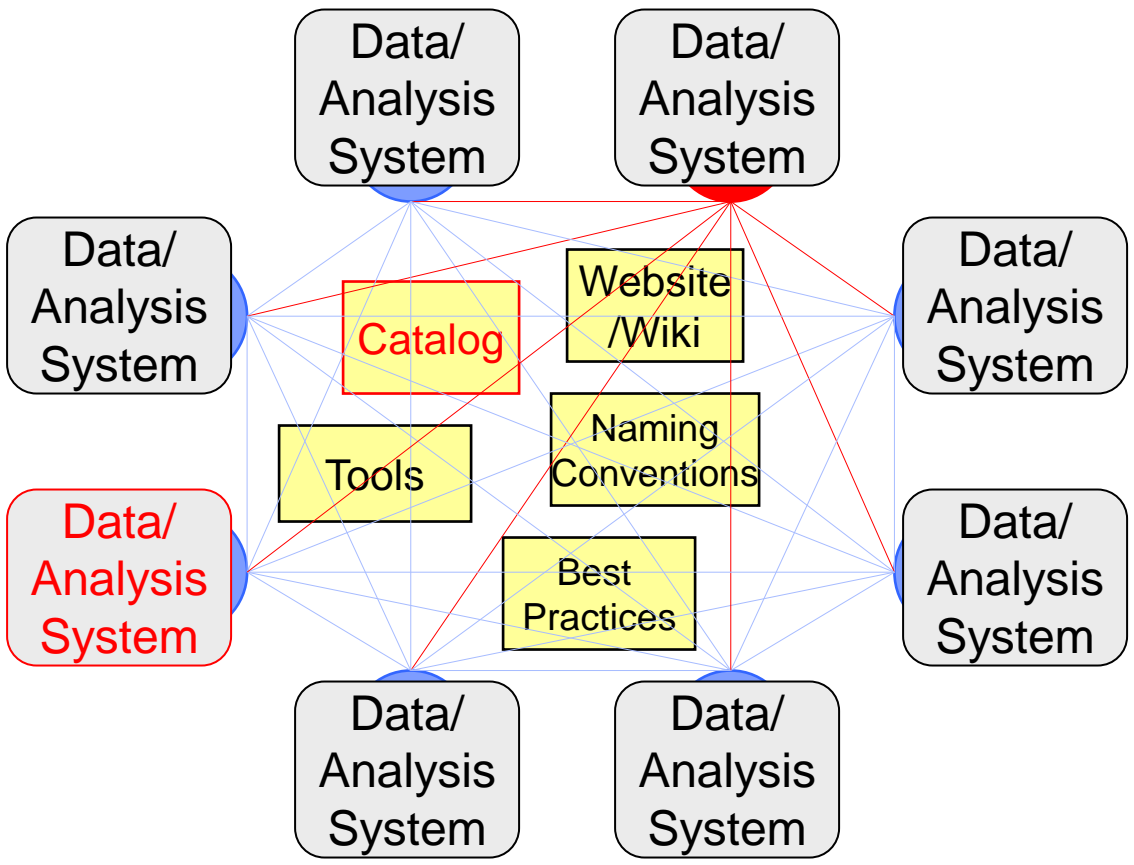
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Community Resources

- Website
- MetaData Catalog
- Naming & Format Conventions
- Best Practices
- Community Tools

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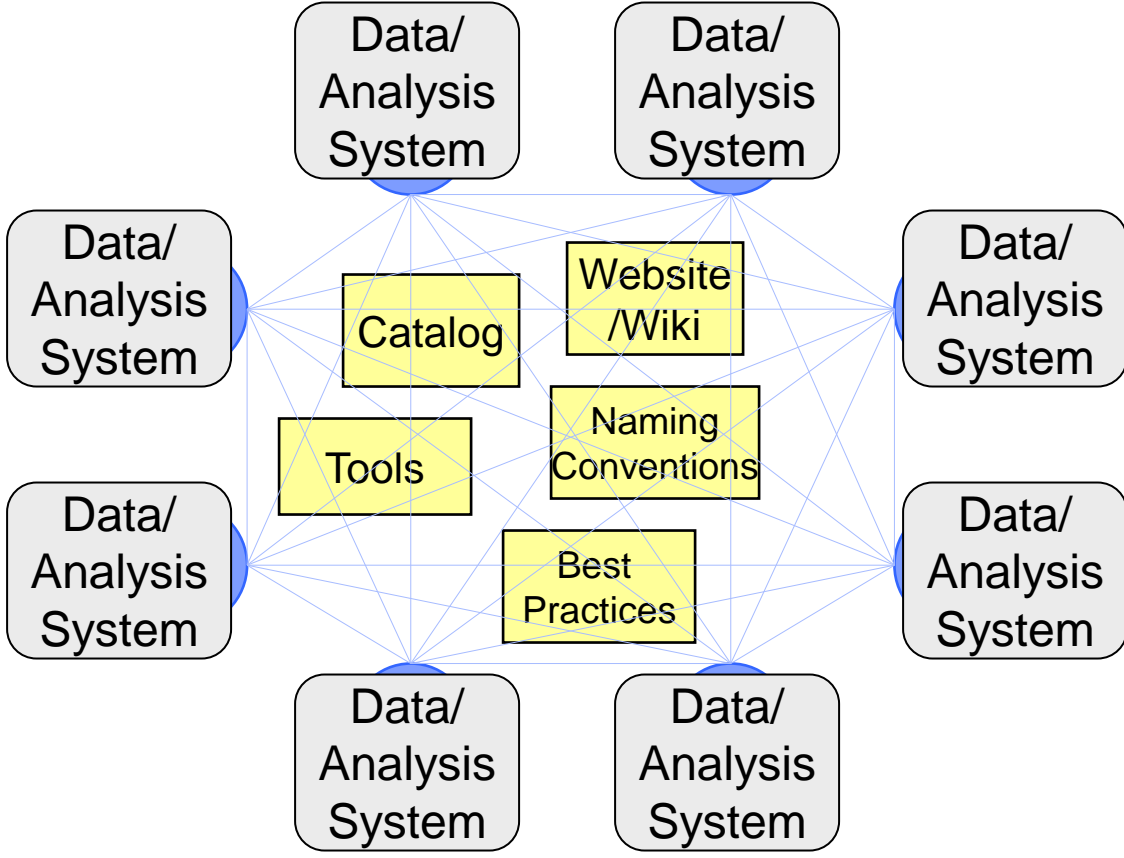
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Projects

Efforts (w or w/o \$) to develop Nodes, Interface Components, or Community Resources

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Forums

- GEO AC/AQ CoP
- ESIP AQWG
- India AQ Resource Group

Today's Agenda

- Updates on Some **Projects**
 - CyAir, AirNow, AQS, TF HTAP, GEIA, CEC, ACP, RSIG, ASDC
- Re-starting the Governance Discussion
 - How will the **Forums** operate?

Introduction to the CyAir Project

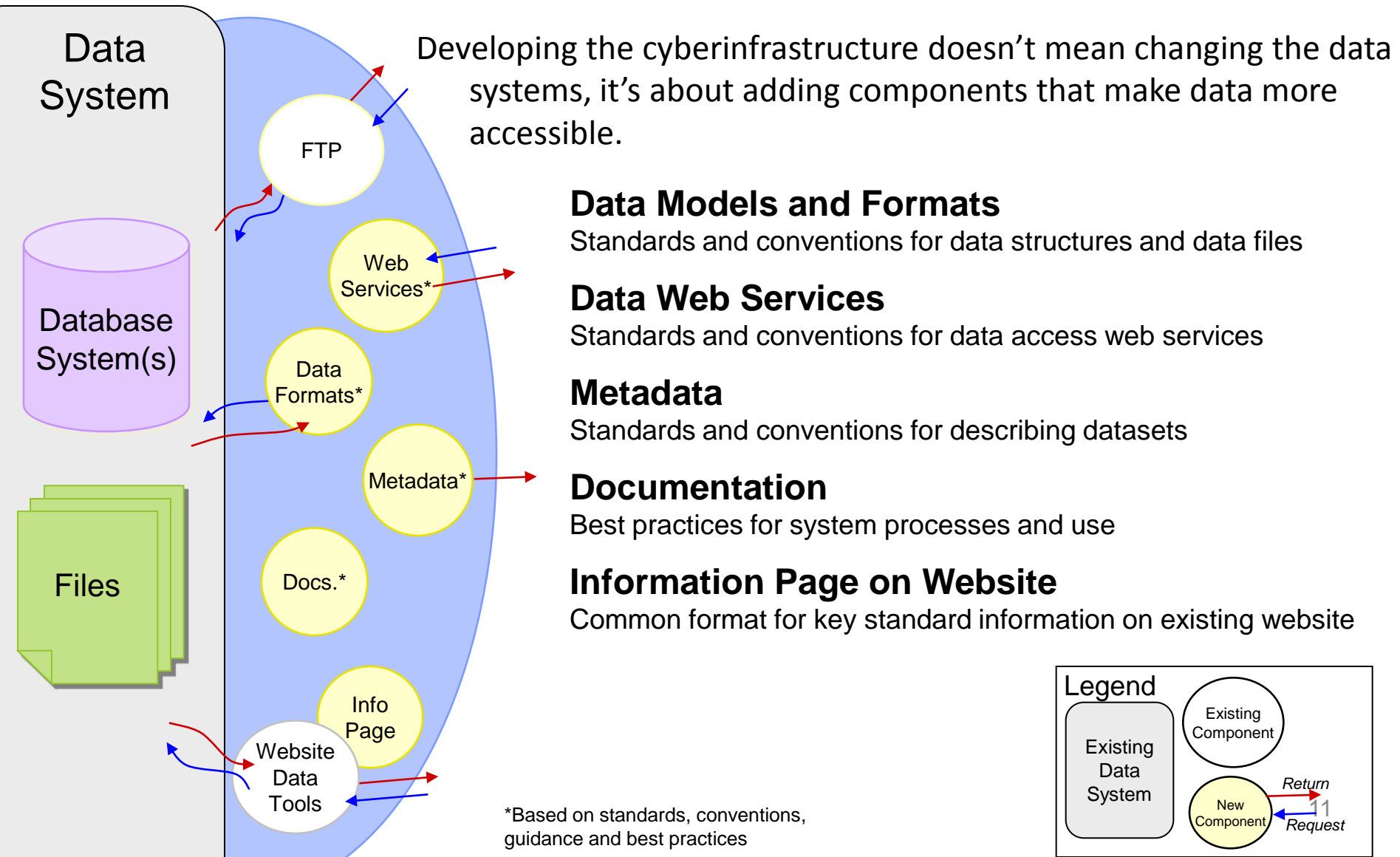
Cyberinfrastructure for Air Quality Management

- CyAir was an **EPA-funded project** to contribute to the planning, development, maintenance and coordination of the cyberinfrastructure used by the air quality community.
- The Project Team included:
 - **Tim Dye & Steve Ludewig**, Sonoma Technology, Inc.
 - **Stefan Falke**, Northrop Grumman
 - **Glynis Lough**, Battelle Memorial Institute
 - **Uma Shankar**, University of North Carolina
 - **Shawn McClure**, Colorado State University
- The project resulted in the development of
 - A set of **recommended investments** that EPA could make to begin to improve the interoperability of existing and future air quality data systems operated by the EPA and our partners.
 - A document describing **best practices** for achieving interoperability in the air quality community.

CyAir Investment Recommendations

1. Develop, distribute, and update guidance and best practices
2. Hire/designate an air quality community organizer/EPA liaison
3. Generate outreach and education information
4. Create a cyberinfrastructure of core air quality data systems
5. Add cyberinfrastructure requirements to EPA contracts, grants, and procurements
6. Create CyAir resource website
7. Provide cyberinfrastructure-building tools and resources for data providers and data users
8. Develop a simple governance structure and leverage other communities

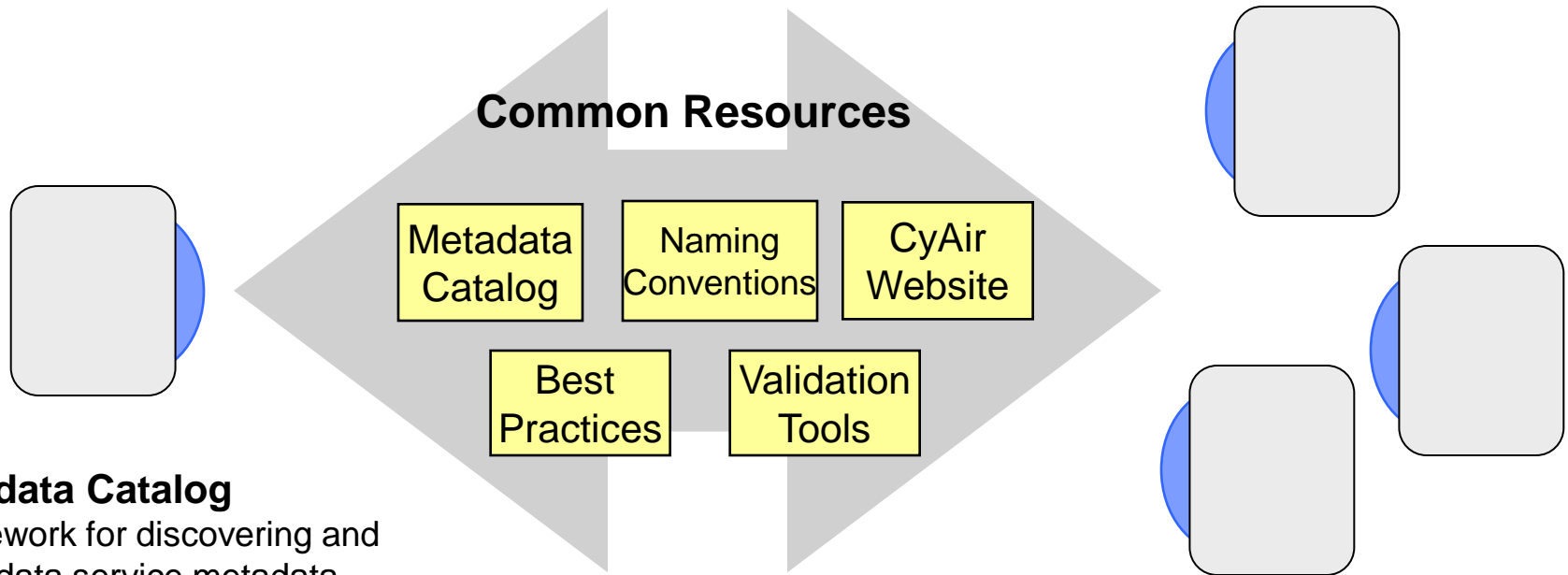
Interface Components



Community Resources

Data Provider

Data User



Metadata Catalog

Framework for discovering and using data service metadata

Best Practices

Vetted and formalized conventions and guidance

Naming Conventions

Common vocabularies and schema for air quality domain areas

Validation Tools

Tools that verify whether services and metadata conform to standards and conventions

CyAir Website

Collaboration website to share cyberinfrastructure best practices

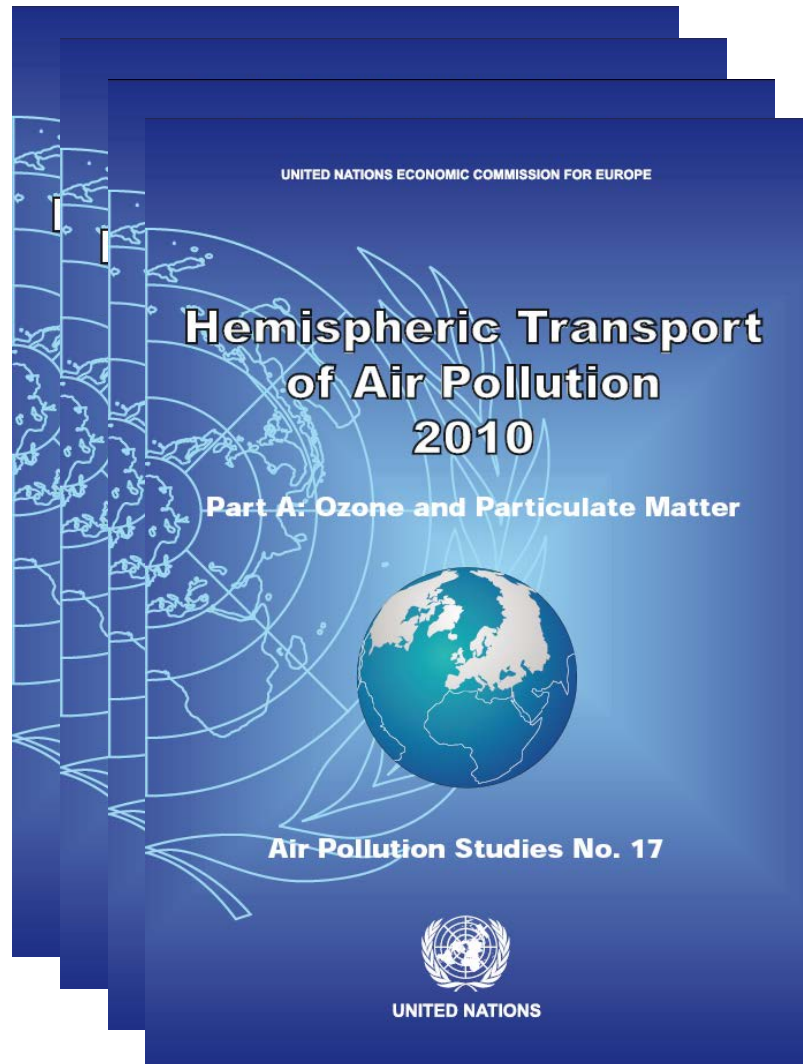
CyAir Best Practices Guidelines

- Introduction to Interoperability
- Data Format Standards
- Naming Conventions
- Web Services
- Metadata
- Data Publication and Discovery

Unfortunately, given resource constraints, the CyAir Project website had to be taken down. Therefore, the Best Practices Guidelines are not currently available online.

What is the TF HTAP?

Task Force on Hemispheric Transport of Air Pollution

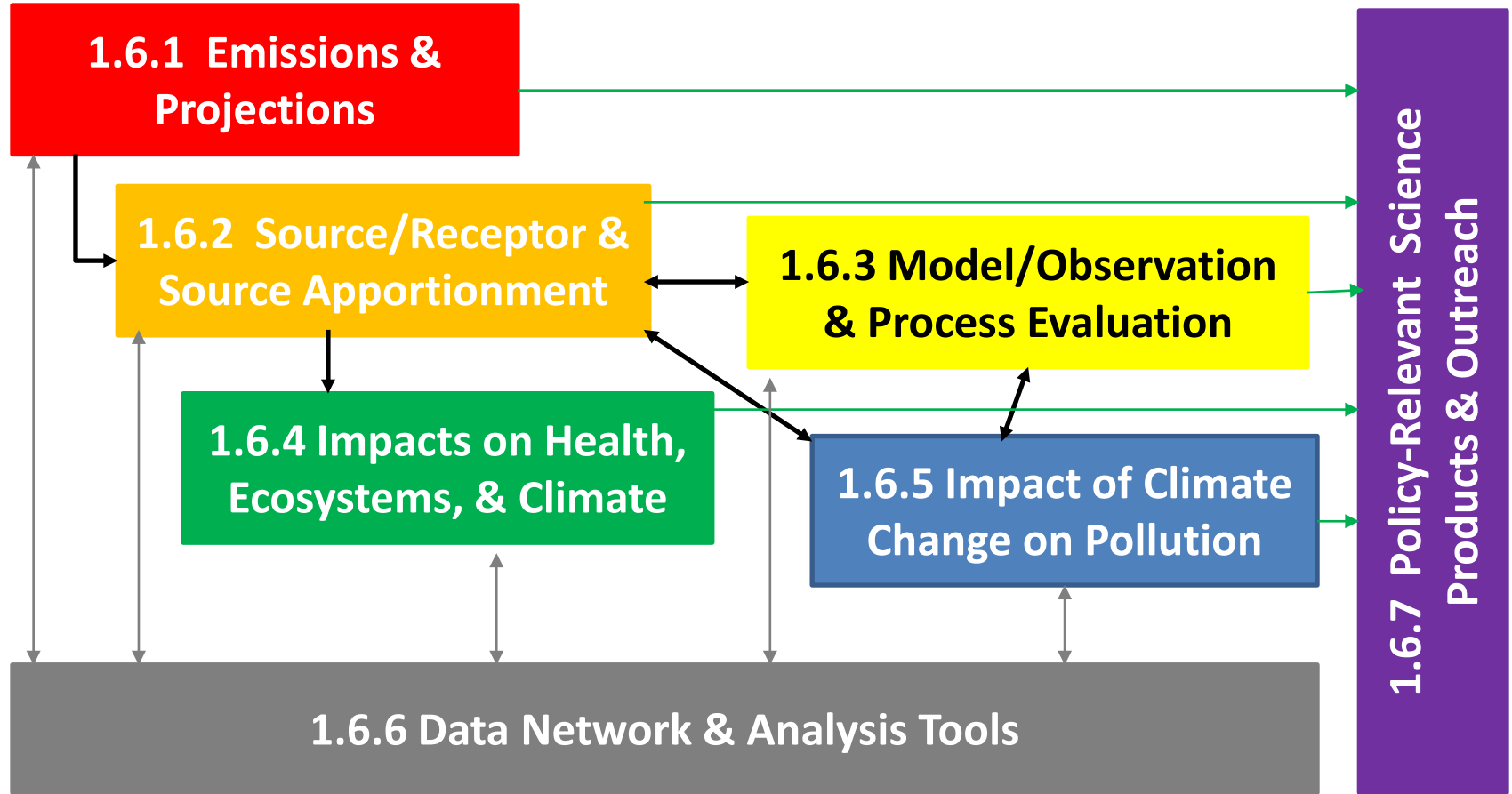


- An expert group established in 2004 by the UNECE Convention on Long-Range Transboundary Air Pollution (LRTAP)
- Co-Chaired by the European Commission (Dr. Frank Dentener, Joint Research Centre) & the United States (Dr. Terry Keating, EPA/OAR)
- Phase 1: 2005-2010, culminated in first comprehensive assessment of HTAP, addressing ozone, fine particles, mercury, and persistent organic pollutants.

www.htap.org

Themes of Cooperative Activities Under TF HTAP

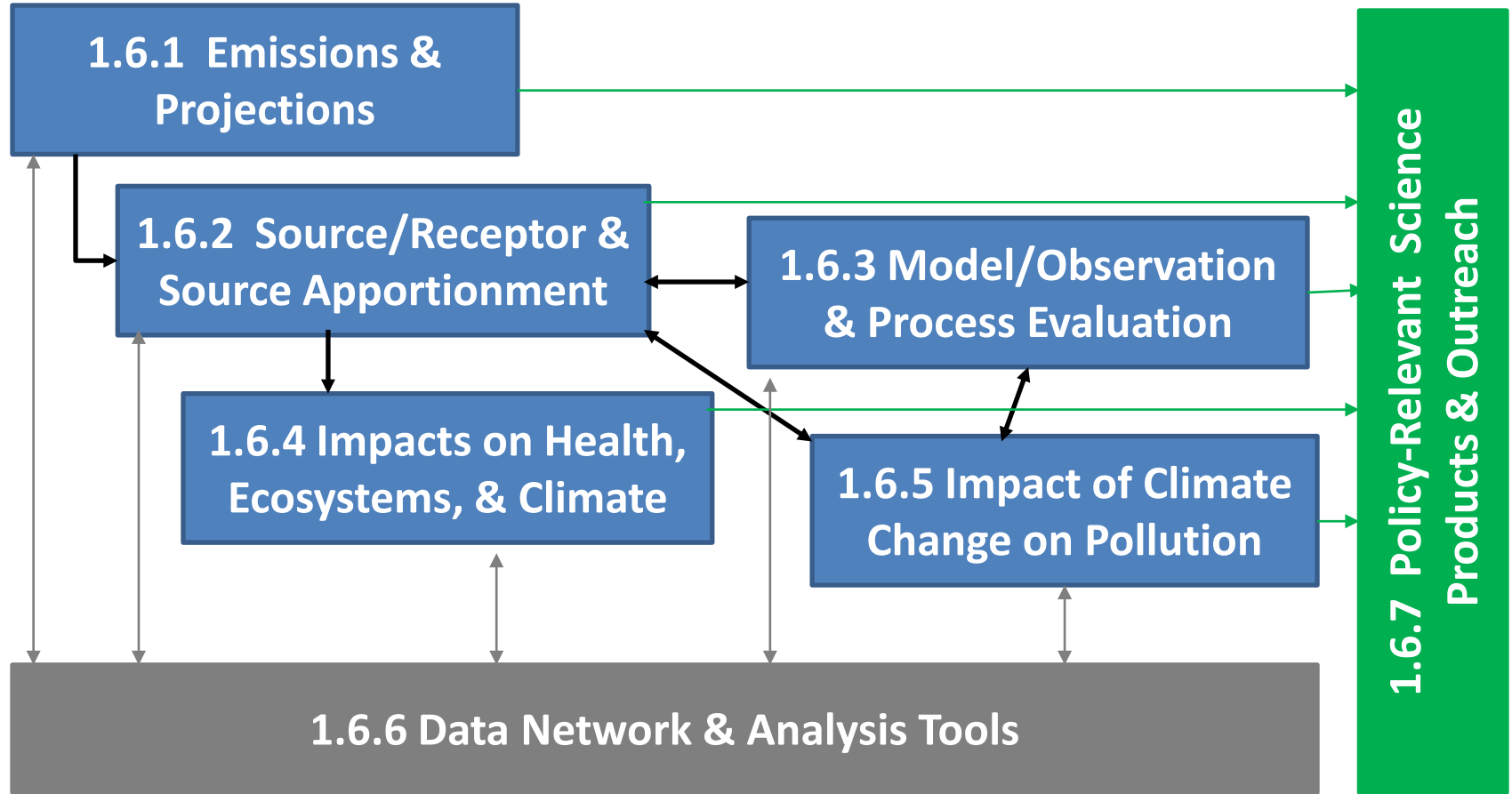
As Numbered in Convention Work Plan



> 35 Work Packages identified, each with a volunteer leader.

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1.6.6 Distributed Data Network and Web-Based Tools

Data Network Status

Distributed Data Archives

FZ Juelich (HTAP1 modeling, MACC)

WU-St Louis/DataFed (surface, satellite observations)

NILU/EBAS (surface observations)

MetNo/AeroCom (HTAP2, AeroCom modeling)

GEIA/ECCAD (emissions)

JRC/ Ensemble (AQMEII modeling)

NASA/ADAM (aircraft observations)

NOAA/CCMI (aircraft, surface observations, emissions)

SNU/ABC-Asia (surface observations)

CAS/MICS-Asia (MICS-Asia modeling)

CEOS(DLR)/ACP (satellite observations)

GAW/WDCs (surface observations)

*Existing
Connections*

*Developing
Connections*

*Seeking
Connections*

Access and Analysis Tools

FZ Juelich

JOIN

MetNo

AeroCom Tools

JRC

Ensemble

US EPA/NASA

RSIG

Extension of the CF Convention

Compliance Checking Tools

Community WCS Implementation