

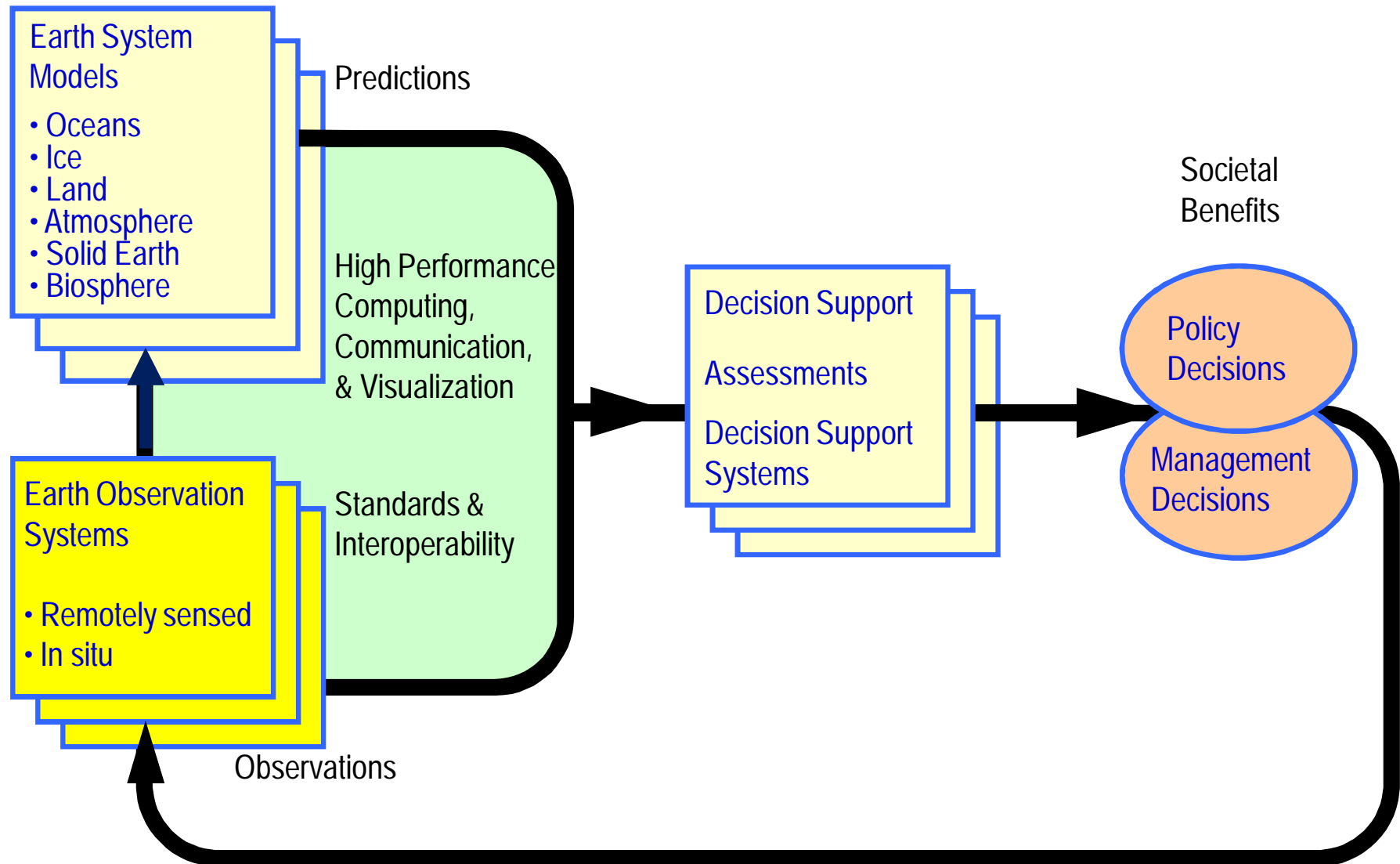
Systems Architecture and Implementation

Stefan Falke

Implementing Standards-based Architectures

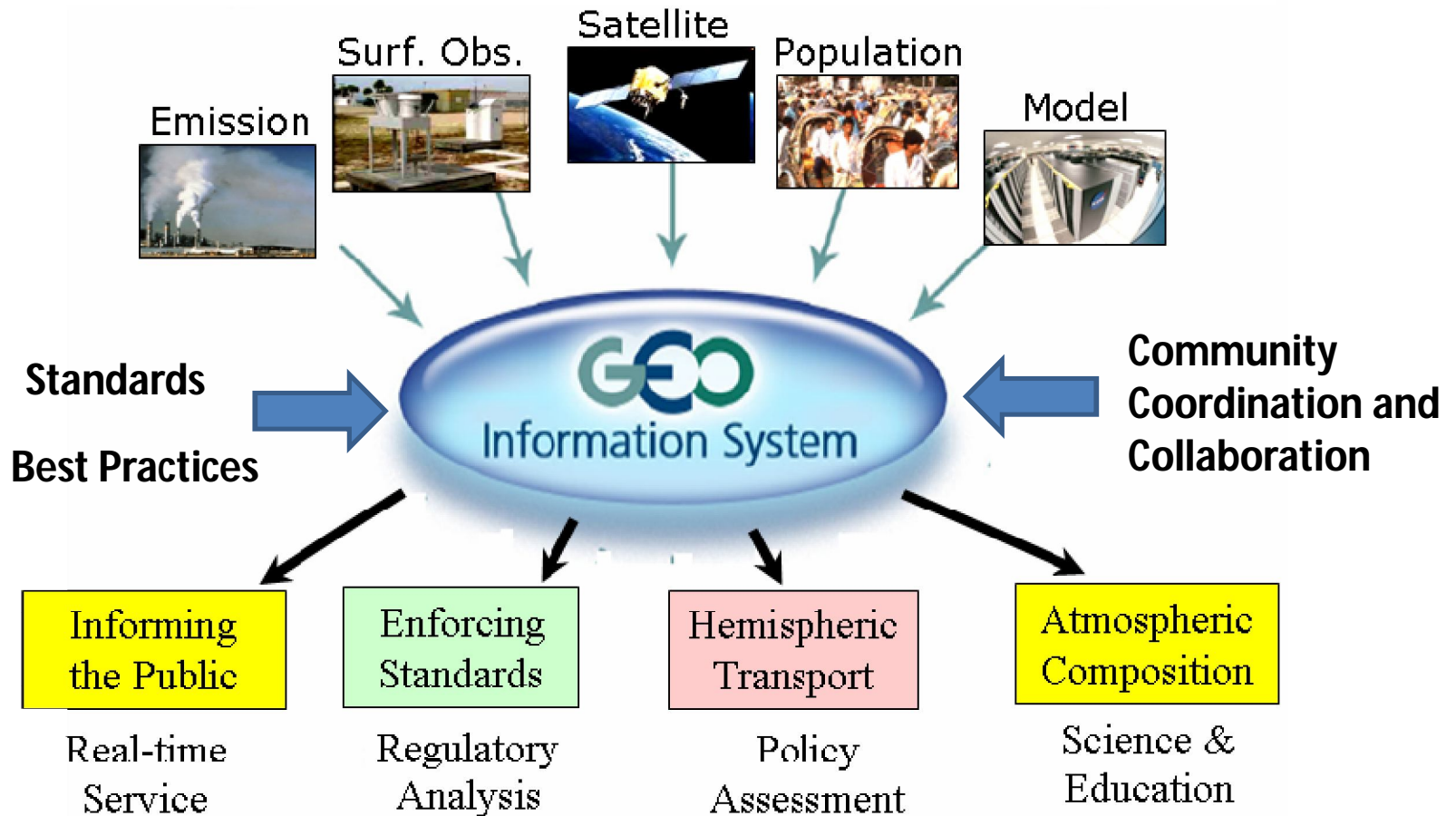
- Design and development of an architecture and infrastructure to support the exchange of energy related information and analysis tools benefits from examples and lessons learned in adjacent disciplines.
- Experiences from ESIP members in information system interoperability activities, such as the Air Quality Workgroup and Global Earth Observation System of Systems Architecture Implementation Pilot, provide reusable elements and lessons learned.
- Useful to explore architectural perspectives based on general information flow principles in the process of generating data from sensors and models, conducting analyses, and providing information for decision making.

From Sensors to Decisions: a general information flow architectural framework



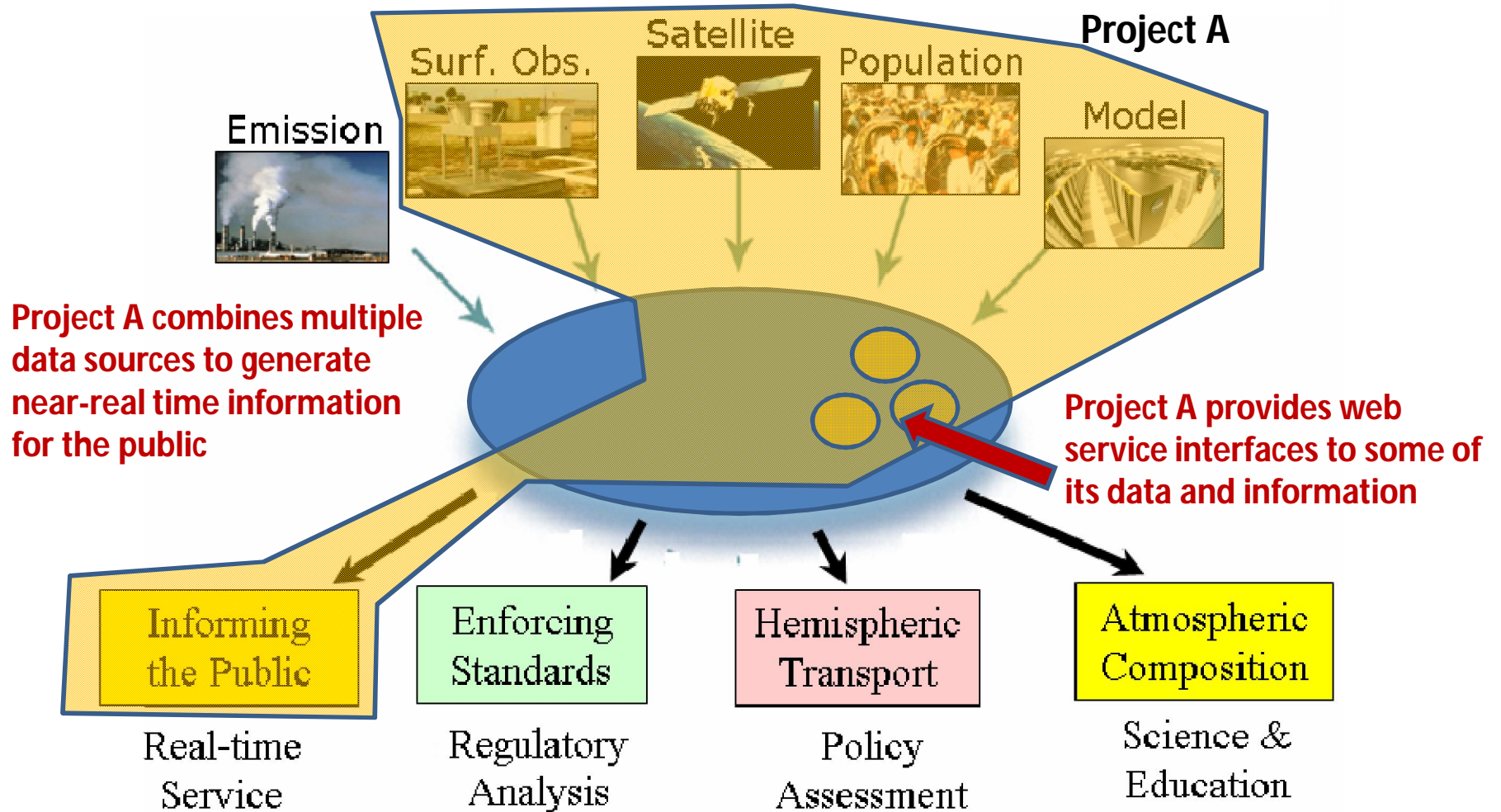
An Approach for Connecting Information Projects

Observing and Modeling Systems



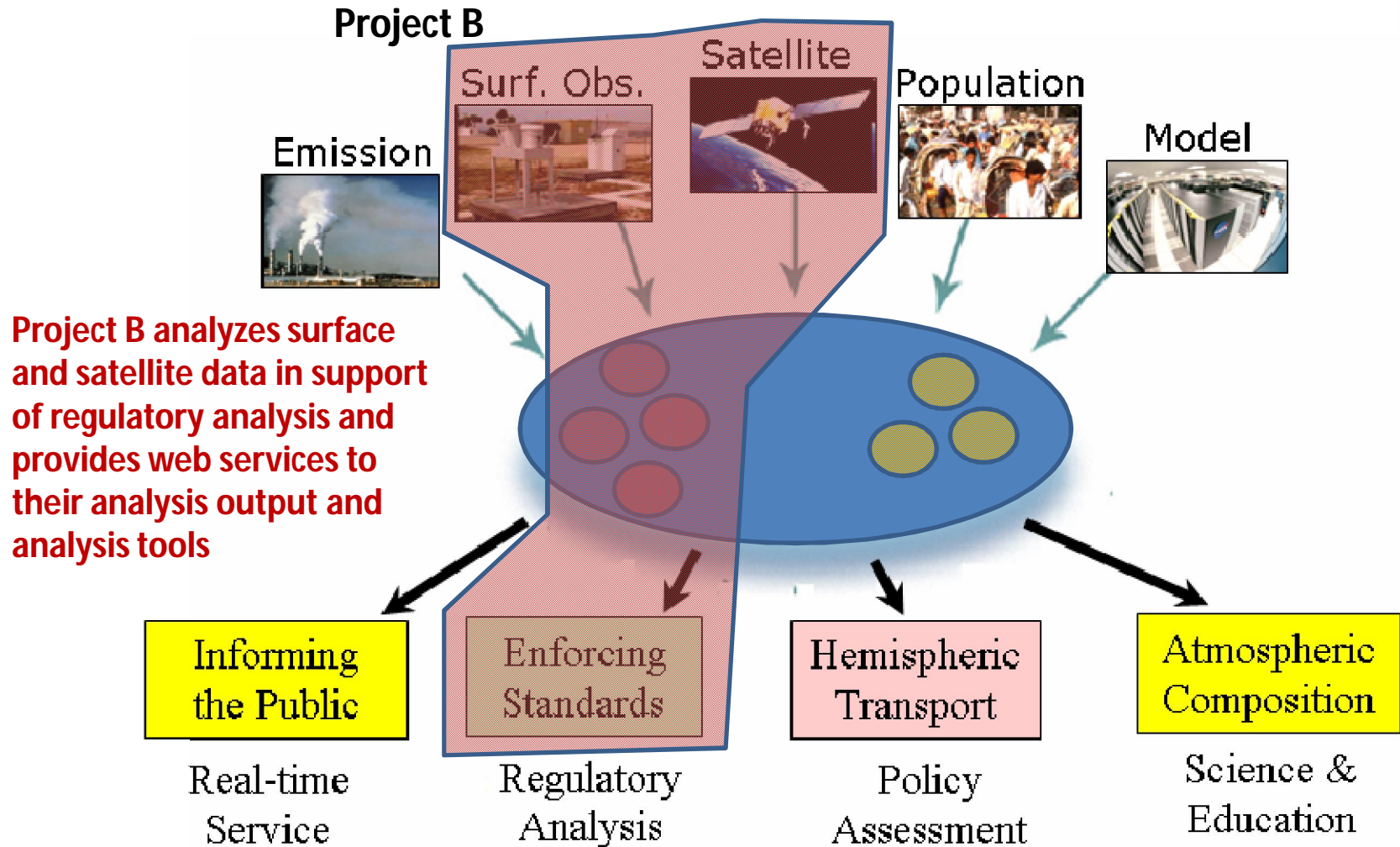
Air Quality & Health Applications

Observing and Modeling Systems



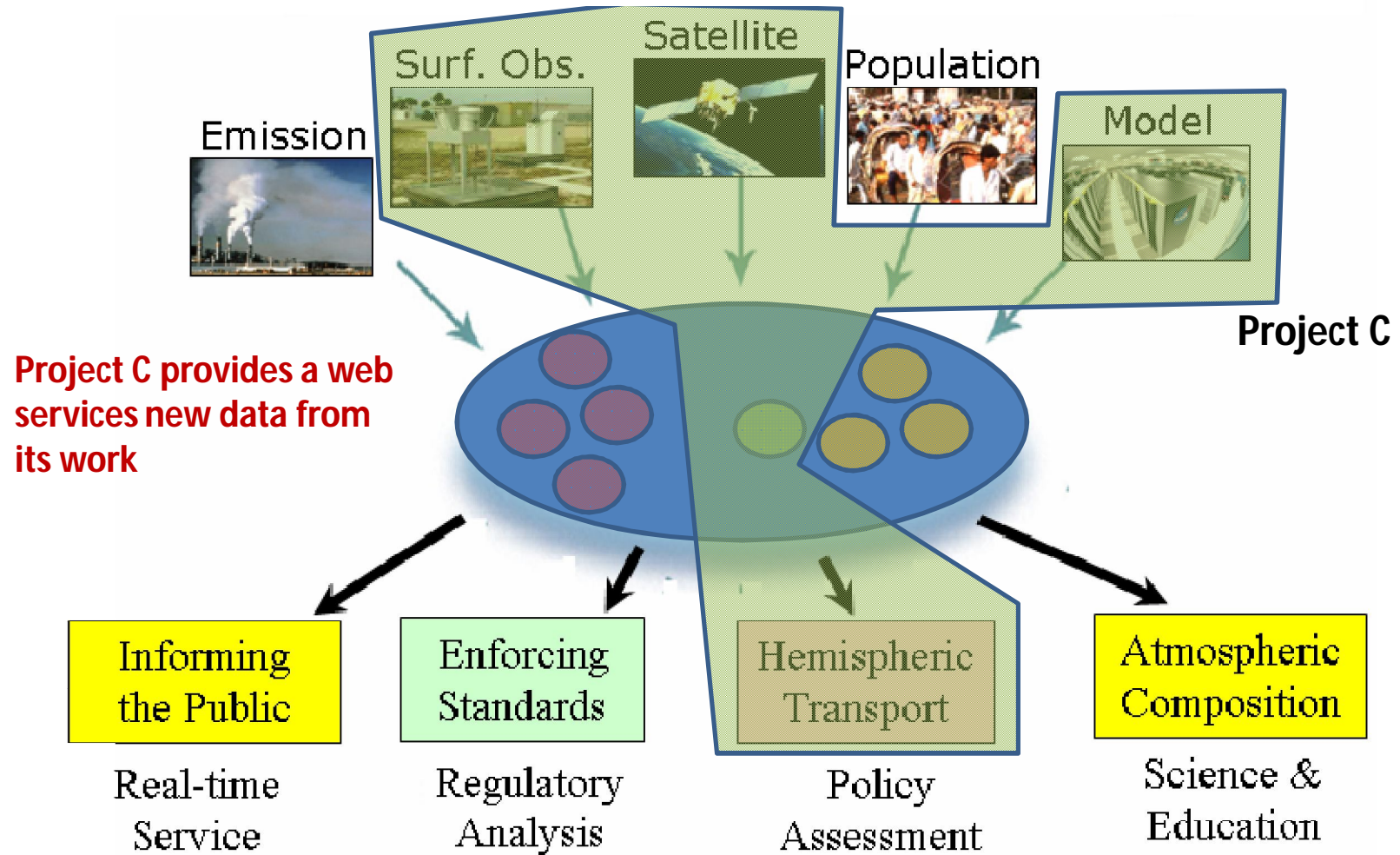
Air Quality & Health Applications

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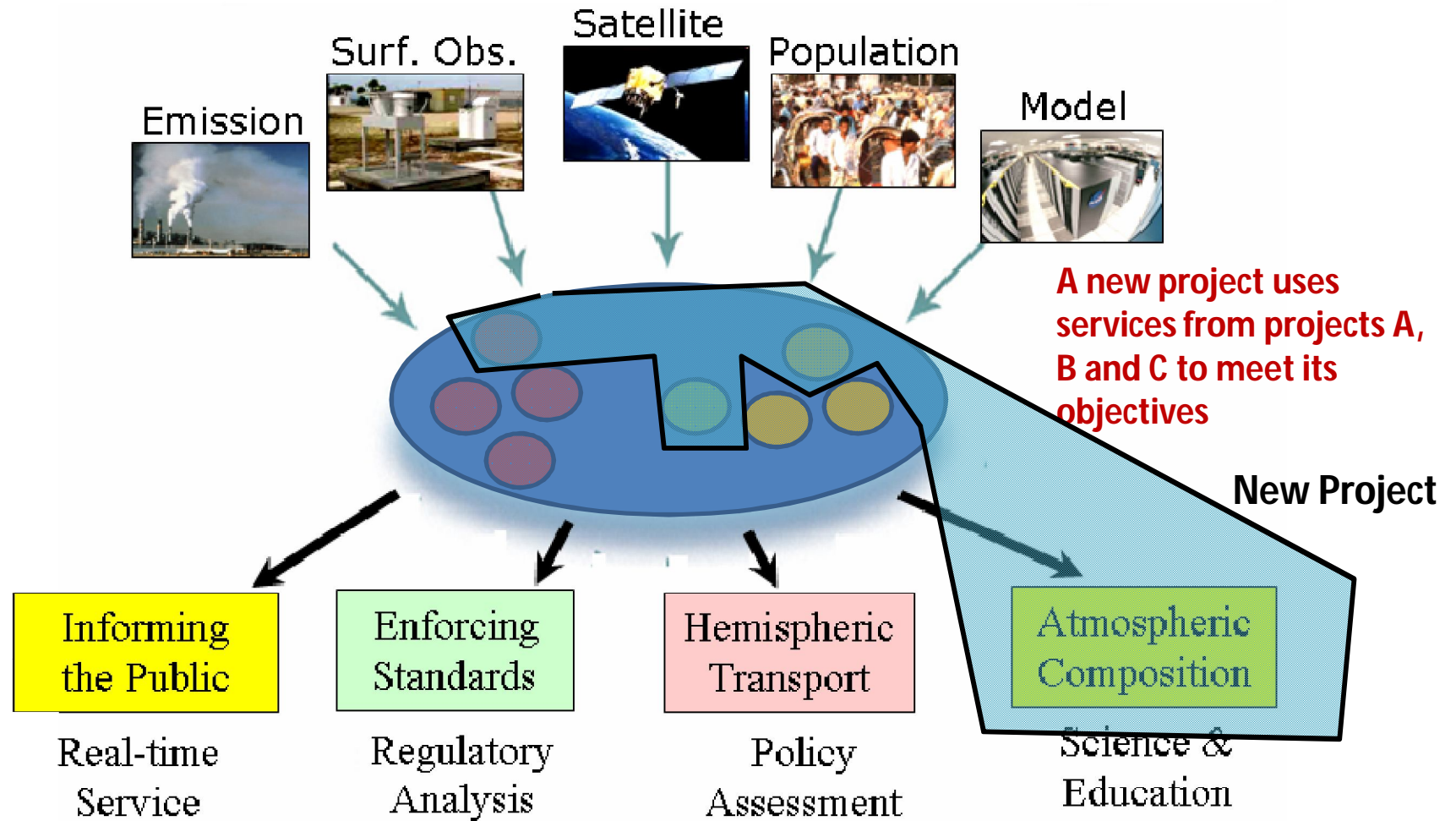
Air Quality & Health Applications

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Air Quality & Health Applications

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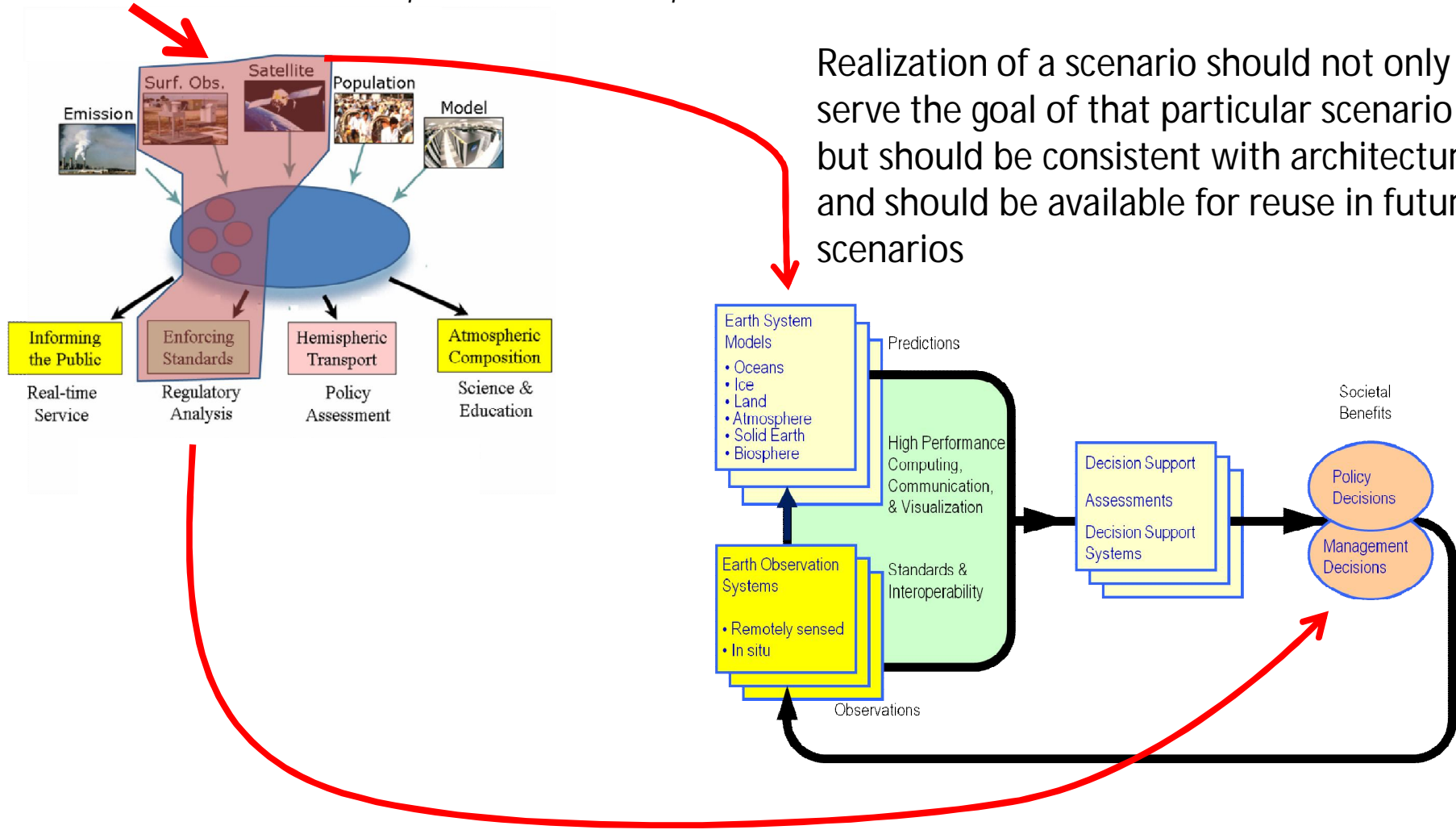


Air Quality & Health Applications

Scenarios feed Architecture Implementation

Scenario is one instance, or is a subset of, the overall architecture.

Realization of a scenario should not only serve the goal of that particular scenario but should be consistent with architecture and should be available for reuse in future scenarios



Building networked components incrementally

- Unlikely to be a single major project
- Groups achieve interoperability on a case-by-case basis
- Share successes with community (Energy Cluster) to make it easier for others to interoperate
- Develop best practices that serve as guidelines to simplify the process of implementing your architecture

Implementing Standards: Community Conventions

- Standards alone are usually insufficient for achieving interoperability
- Standards can be implemented in multiple ways – in many cases the multiple implementations are all “standards compliant”
- Communities have begun adopting standards implementation conventions
 - agreed upon ways a particular community implements a particular standard
- Example: netCDF
 - netCDF is a data format standard
 - Multiple conventions for netCDF
 - Communities need to reach consensus on the best convention for them
 - Coordination across the community is needed in order to achieve best practices for implementing the netCDF convention

Community Collaboration Portals

The screenshot shows the GEO AQ CoP website interface. At the top, there's a breadcrumb trail: 'page', 'discussion', 'view source', 'history'. The main header includes the ESIP Federation logo and the GEO Group on Earth Observations logo, along with the title 'Air Quality Community of Practice'. Below the header, a paragraph describes the GEO AQ CoP as a self-organized voluntary group. The page is organized into several sections: 'News' with a list of recent events, 'GEO AQ CoP Activities' with a list of ongoing projects and reports, 'Constituent Communities of AQ CoP' listing various support groups, and 'Resources' with links to data portals and science teams. A search bar and a toolbox are located on the left side of the page.

Shared web space where

- data services and tools can be cataloged
- best practices documented
- state of interoperability assessed
- community coordinated

The screenshot shows the CIERA website. The header features the CIERA logo and the tagline 'Community Initiative for Emissions Research and Applications'. A search bar is located in the top right corner. Below the header, there's a navigation menu with links: 'Home', 'About', 'Forums', 'Blogs', 'Data', 'Analysis', 'Events', 'Help', 'Development', and 'Login or Register'. The main content area starts with a 'Home' section and a 'Community Initiative for Emissions Research and Applications (CIERA)' heading. A welcome message introduces CIERA as a community effort to improve emissions information within the Global Emissions Initiative (GEIA). A list of goals is provided, followed by a diagram of the GEIA structure. Three main sections are highlighted: 'Find' (emissions datasets), 'Analyze' (emissions inventories, observations, and model output), and 'Connect' (active part of the CIERA community). Each section includes a brief description and a list of actions or resources.