The Cybercartographic Atlas of Antarctica

P.L. Pulsifer & D.R.F. Taylor
Geomatics and Cartographic Research Centre (GCRC)
Carleton University
Ottawa, Canada

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Presentation Overview

- Background
- Atlas Overview
- Current Implementation Strategies
  - Enabling Interoperability Needed for a Web Services Model
- Relevance of JCADM to CAAP
- Concluding Remarks

Background

Project History

- First proposed by Dr. Vergani of Argentina, 1999
- Formally adopted by SCAR-GGI in Sienna, 2001
- Two workshops held to date
  - Puerto Madryn, December 2001
  - Ottawa, May 2002
- Secured four year grant from Social Sciences and Humanities Research Council of Canada: January ’03 – December ‘06

What is a “cybercartographic atlas”?

- An atlas can be defined as a collection of maps relating to a particular theme or topic

- A cybercartographic atlas can be defined as a collection of *spatially enabled information systems* that relate to a particular theme or topic

De-mistifying "Cybercartography"

Characteristics of a cybercartographic system

- Interactive
- Information package ("portal" vs. software)
- Multi-sensory
- Multimedia
- Produced by interdisciplinary teams
- Forms new partnerships
- Applied to a wide variety of subjects

GCRC Research

- Focus on developing new methods and theory related to cartographic visualization
- Research questions include:
  - how effective is the use of 3D/4D collaborative visualization for increasing understanding?
  - what is an effective mix of media types (maps, text, images, visualizations)?
  - how can we make these systems more usable?

Atlas Overview

Atlas Goals

- Create an innovative new product and methodology to compliment discovering, utilizing, presenting and distributing existing information and data about Antarctica to a wide variety of users, including scientists, decision makers and the general public
- Facilitate increased cooperation and information exchange between Antarctic stakeholders under the terms of the Antarctic treaty
- Through international cooperation, to develop and link National Atlases (Spatially Enabled IS) of Antarctica

User Communities

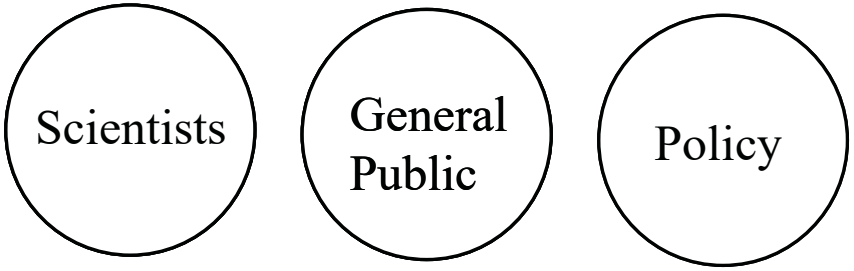
- General public
  - Learn from theme specific synthesis of data on Antarctica
- Policy makers
  - Integrate and analyse data to support policy decisions i.e. SOE/CEP (Cordonnery, 1999)
- Scientists
  - Integrate and analyse data using scientific visualization to support information discovery and knowledge generation

Proposed Themes

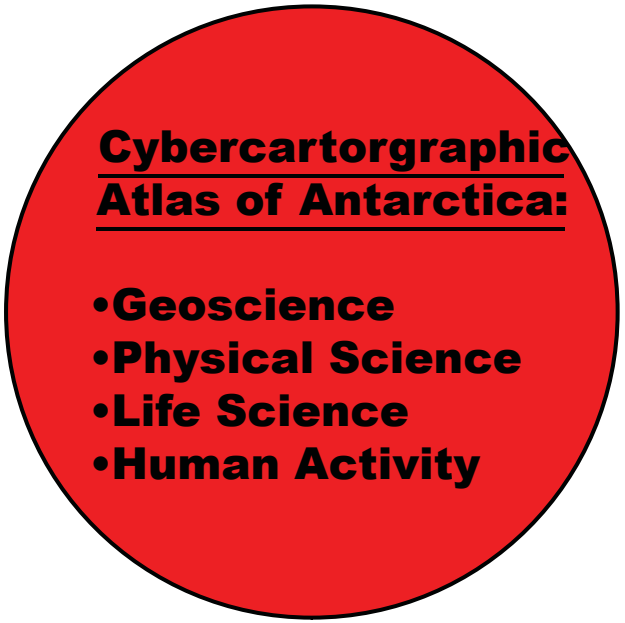
- Ice – characteristics, processes and effects
- Historical Exploration of the Antarctic
- Penguins in Hope Bay (Argentina/CCAMLR)
- Geodesy
- Antarctica and Global Climate Change
- Others? ….
- Mapping metadata
- SOE reporting
- Ice monitoring for fuel delivery (Brunt, 2003)

Current Implementation Strategies

Users



User / Providers



Providers

Proposed Service Model

- Web services approach
- Links between services using standard data models and encodings
- Service Categories (example):
  - Application services ("where portal?")
  - Portrayal Services (Web Map Service)
  - Processing Services (i.e. numeric model)
  - Data Services (Web Feature Server)
  - Registry Services (AMD)

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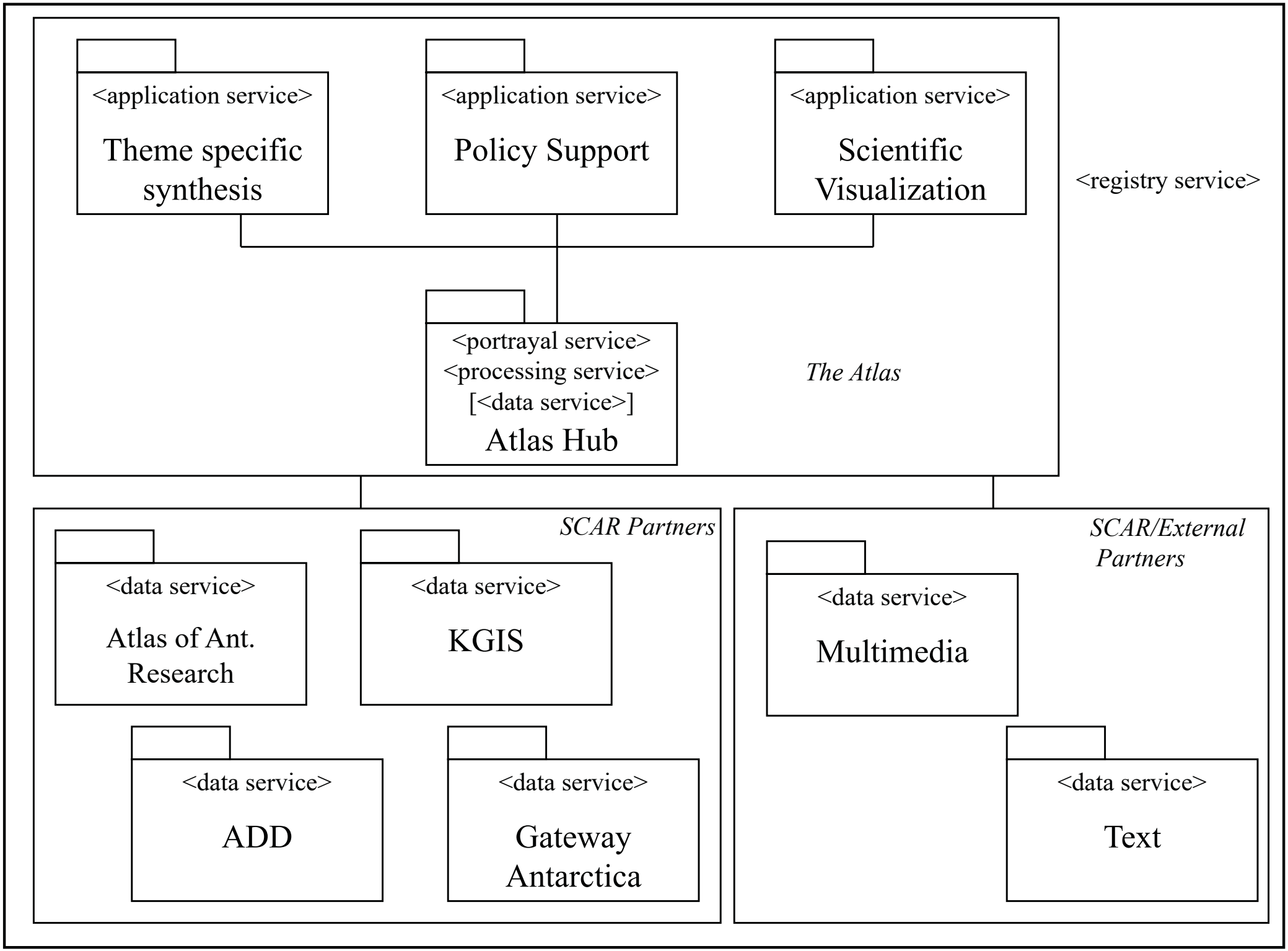
<application service>
Theme specific synthesis
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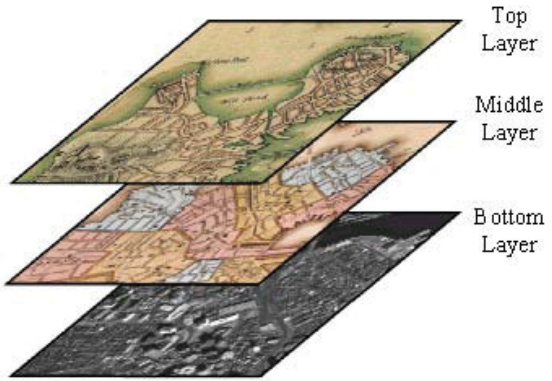
Policy Support
<application service>
Scientific Visualization
<registry service>
<portrayal service>
<processing service>
[<data service>]
Atlas Hub
The Atlas
SCAR Partners
<data service>
Atlas of Ant. Research
<data service>
KGIS
<data service>
ADD
<data service>
Gateway Antarctica
SCAR/External Partners
<data service>
Multimedia
<data service>
Text

Enabling Interoperability Needed for a Web Services Model

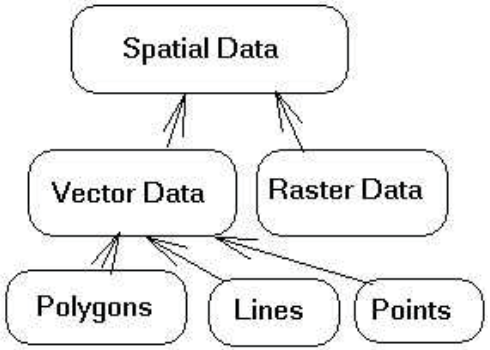
Data Models

- Trend is towards a standardized spatial schema based on features

- Layer model – traditional GIS



- Feature model - Object-relational and Object-oriented GIS (i.e. ISO 19107)



Standard (OGC/ISO) Interfaces and Encoding

- Interfaces:
  - Web Feature Server
  - Web Map Server
  - Web Coverage Server
  - Catalog Service (implications for AMD?)
- Encodings:
  - Geography Markup Language
  - ISO 19115 as XML

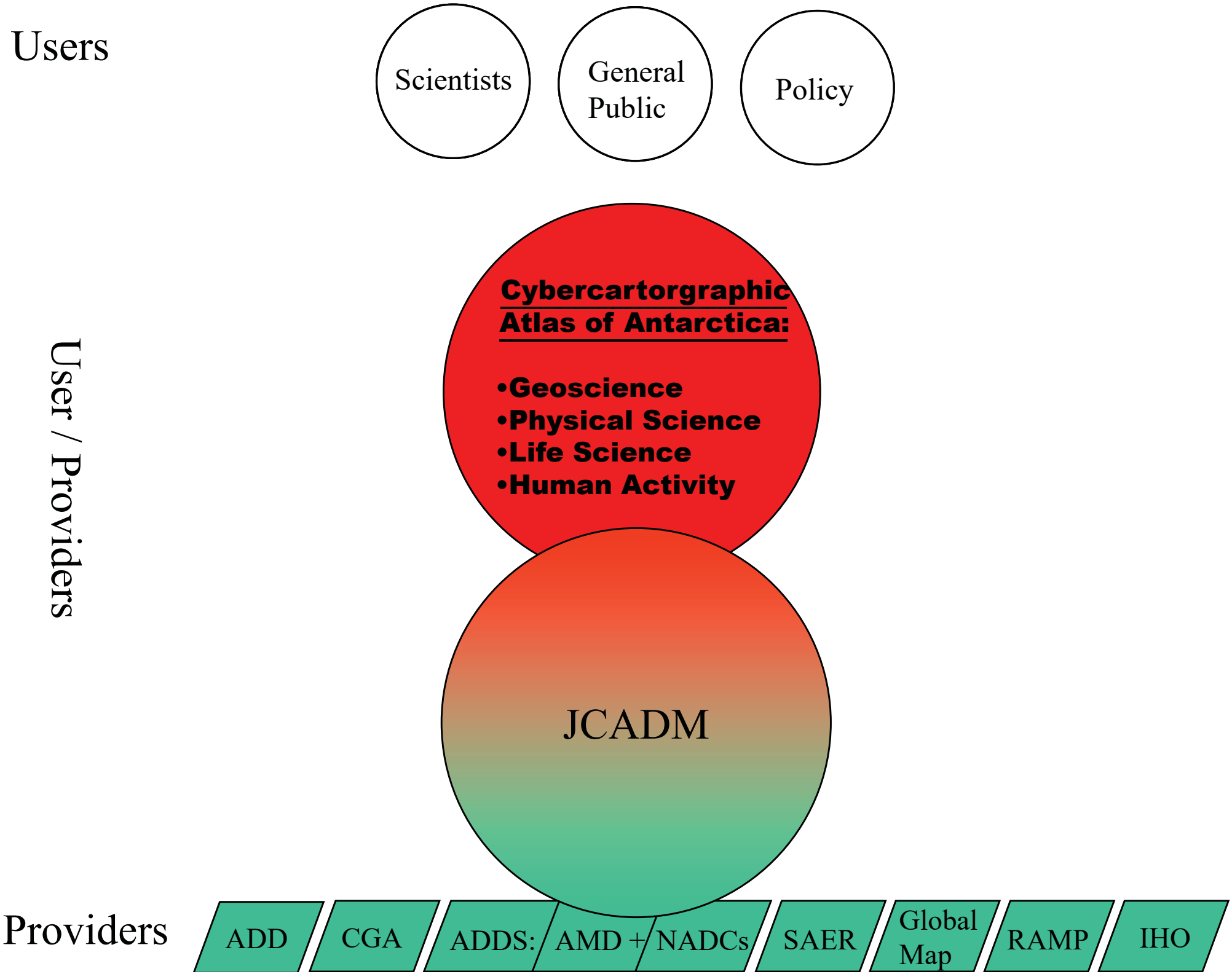
System Development Requirements

- Knowledge of science domain, geo-informatics, standards etc.
- Some level of software development expertise
- DATA REGISTRY!
- Does NOT require huge software budget

Relevance of JCADM to CAAP

Potential Links

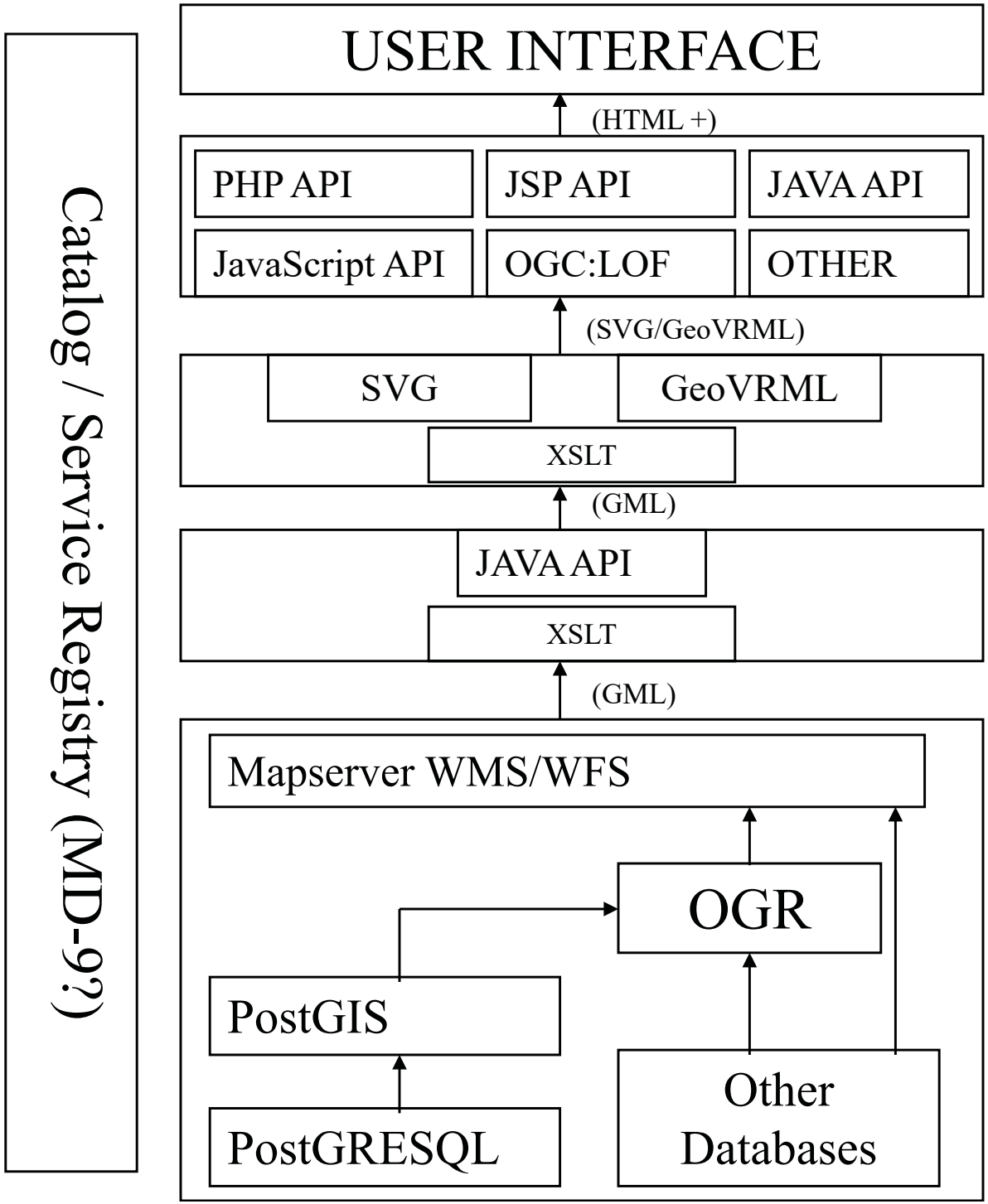
- Are there potential linkages between the Cybercartographic Atlas of Antarctica Project and JCADM?
- JCADM -> CAAP : data discovery, facilitation of interoperability
- CAAP -> JCADM : infrastructure, development staff, research


Users
Scientists
General Public
Policy
User / Providers
Cybercartorgraphic Atlas of Antarctica:
•Geoscience
•Physical Science
•Life Science
•Human Activity
JCADM
Providers
ADD
CGA
ADDS:
AMD +
NADCs
SAER
Global Map
RAMP
IHO

Concluding Remarks

- Relationship between CAAP and JCADM has potential to be mutually beneficial in many respects
- Opportunity to turn data into applications
- Close cooperation will be the key to success

Mapserver Implementation: Public Domain Approach



User

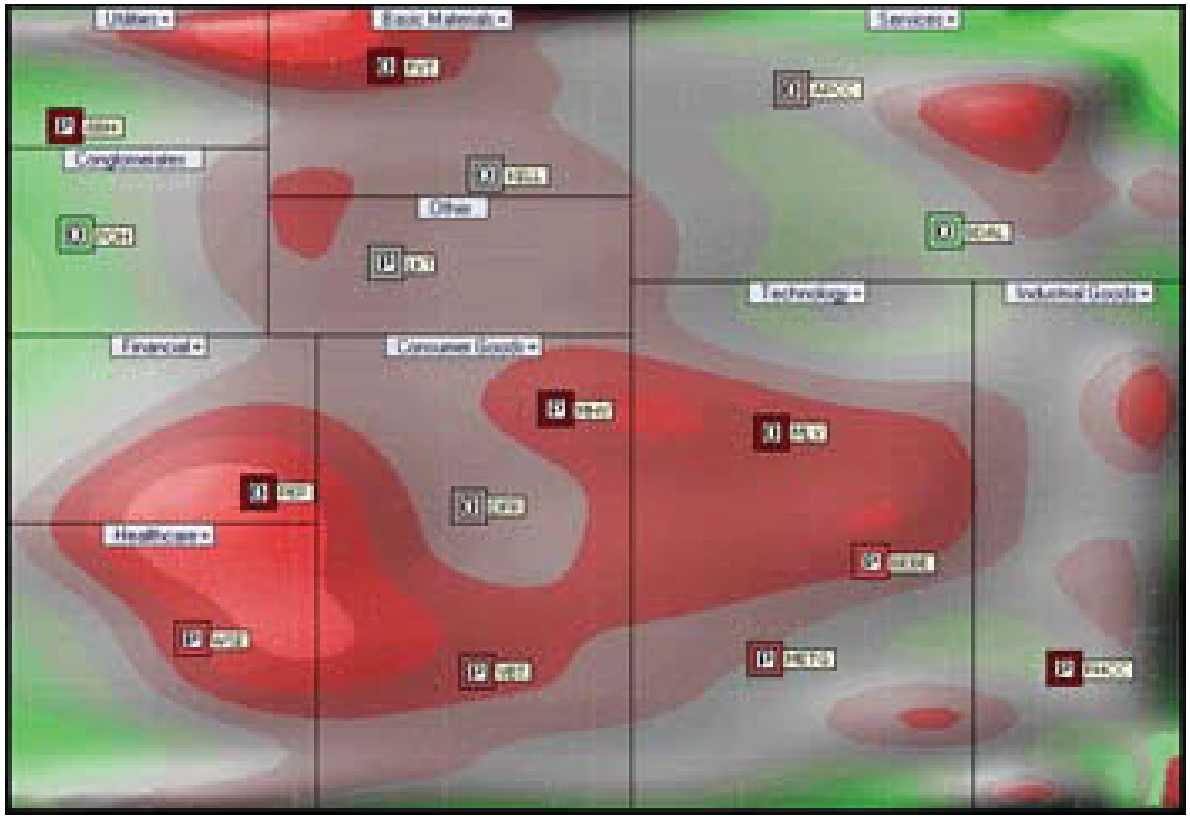
Application service

Portrayal service

Processing Service

Data Service

Information Space



http://www.cybergeography.org/atlas/conceptual.html

http://www.webmap.com/