

## A Vision of

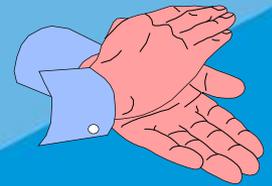
# Enterprise Environmental Spatial System (ES)<sup>2</sup> for Supporting Environmental Modelling

"Leadership is the capacity to translate vision into reality." (Warren G. Bennis)

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Environmental Modelling Workshop 2013  
Edmonton, March 13, 2013

# Acknowledgements

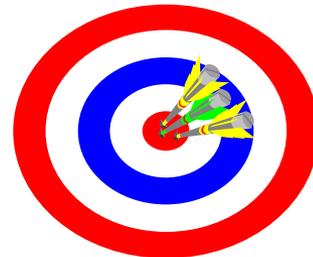


- Anil Gupta
- Barry Northey
- Brian Sawyer
- Bob Barraclough
- Curt Romaniuk
- Daryl McEwan
- Dave Junor
- Derek Nalder
- Don Page
- Geniene Sabila
- James Greengrass
- Jordan Erker
- Judy Heilman
- Justin Wilkes
- Kelsey Ayton
- Lee George
- Matthew Lynch
- Moses Bitew
- Patrick Vacca
- Phil Mackenzie
- Ray Keller
- Scott Kilborn
- Stuart Cruikshank
- Tom Davis
- Vernon Remesz
- More...

# Purposes of the Presentation

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- Share the (ES)<sup>2</sup> vision
- Receive your feedback
- Explore future engagement and collaboration opportunities



# Presentation Outlines

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1. Background
2. Challenges
3. (ES)<sup>2</sup> vision
4. Conceptual demo
5. Summary



# Presentation Outlines

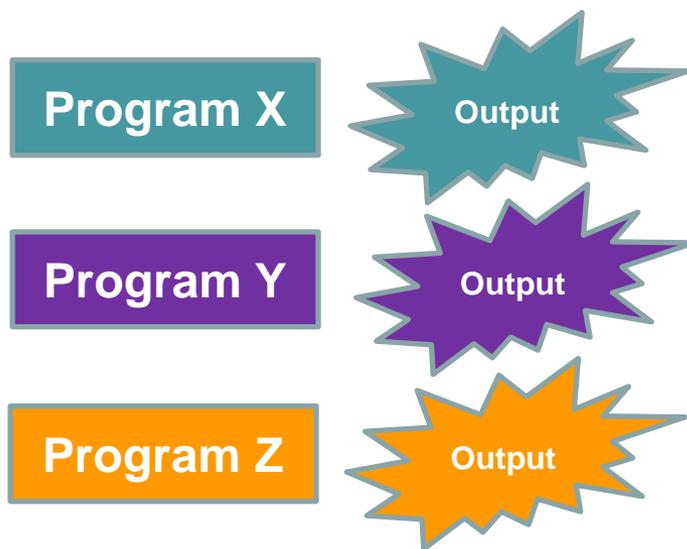
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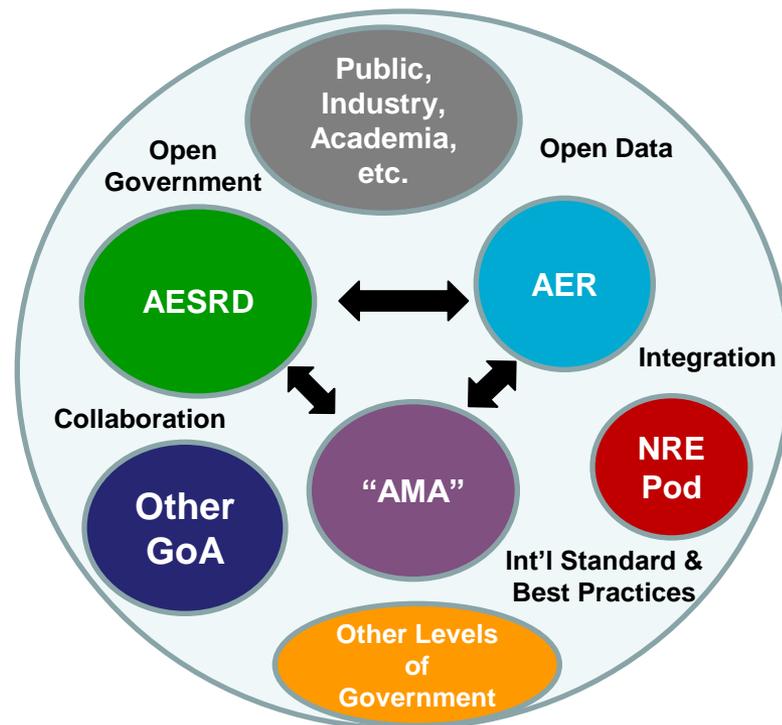
# Old Paradigm vs. New Reality

## The Old Paradigm



Program-centric with little to no perceived requirement for coordination or alignment between programs or departments.

## The New Reality



A "System of Systems" delivering the outcomes of Integrated Resource Management (IRM) and Cumulative Effects Management (CEM).

\* Modified based on ESRD draft informatics Program Governance (2013)

# Data → Information → Knowledge

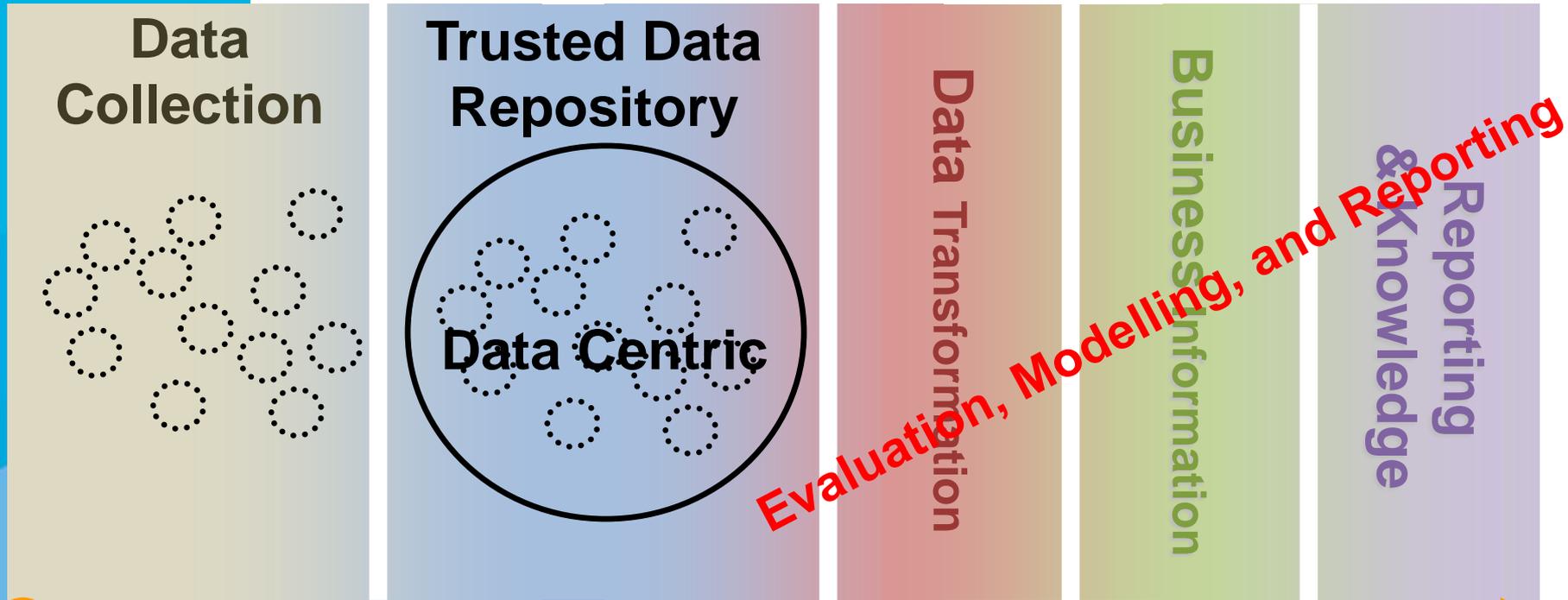
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- “We are drowning in data and thirsting for information” (John Naisbitt, Megatrends, 2000)
- 80% of all data contains some reference to geography (Franklin and Hane, 1992)
- Use a GIS to manage, visualize, explore, synthesize, and analyze the spatial data; and turn data into information into knowledge.
- Put the right data/information/knowledge, in the right format, in the right hands, at the right time - Informatics.



# Enterprise Data Management System (EDMS) & (ES)<sup>2</sup>

Governance – Standards, Processes, Open and Security



Data Collection

Data Management & Distribution

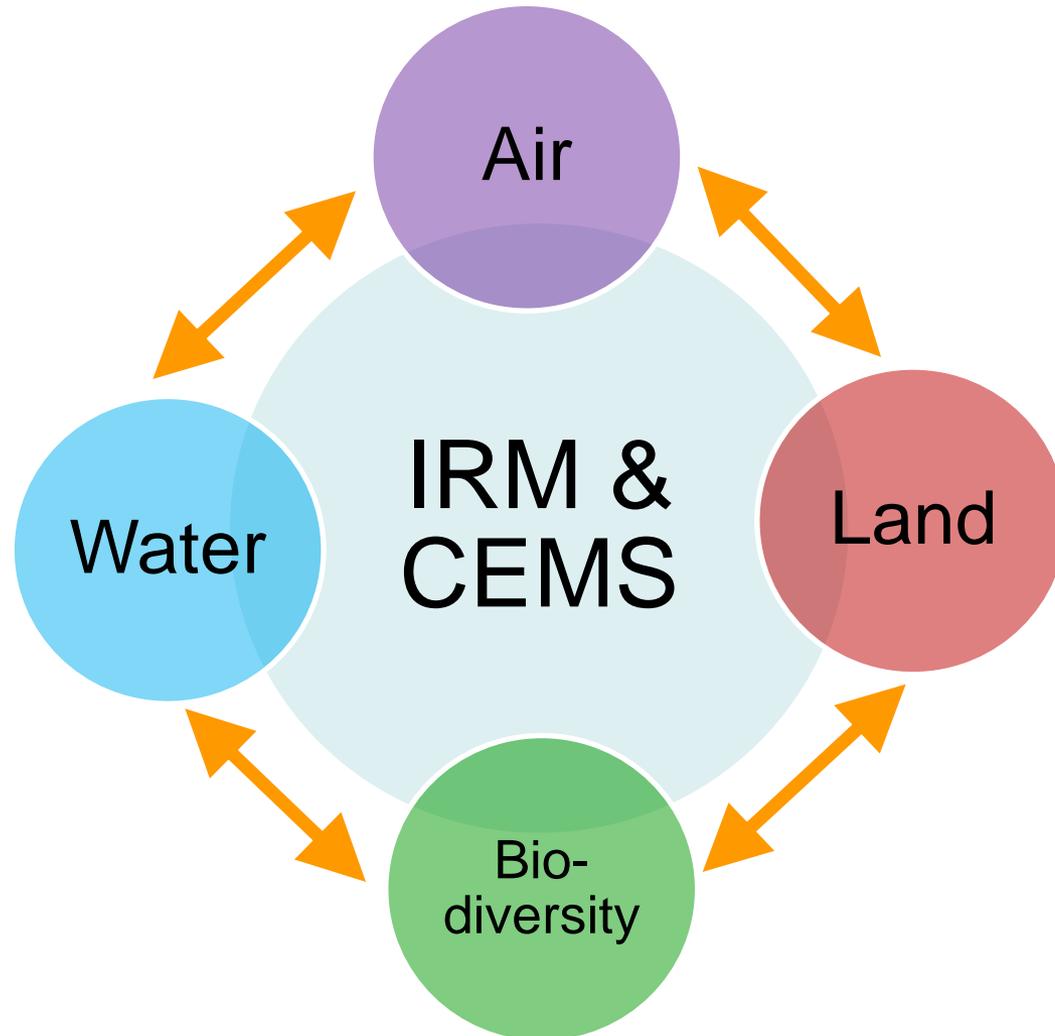
Value-Added Data/Information

EDMS

(ES)<sup>2</sup>

# Need More Integrated and Collaborative Approach...

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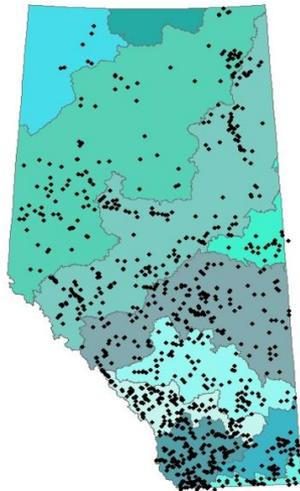
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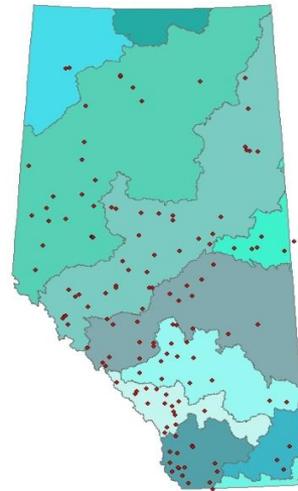


# Challenge #1: Data Availability

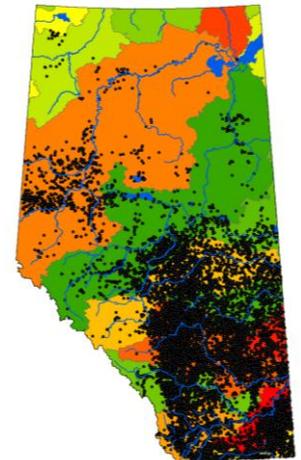
Data are often unavailable or insufficient for the area of interest. We simply cannot afford to monitor everything in everywhere, for example:



1,100  
Hydrometric  
Stations



140 'Suitable'  
Hydrometric  
Stations

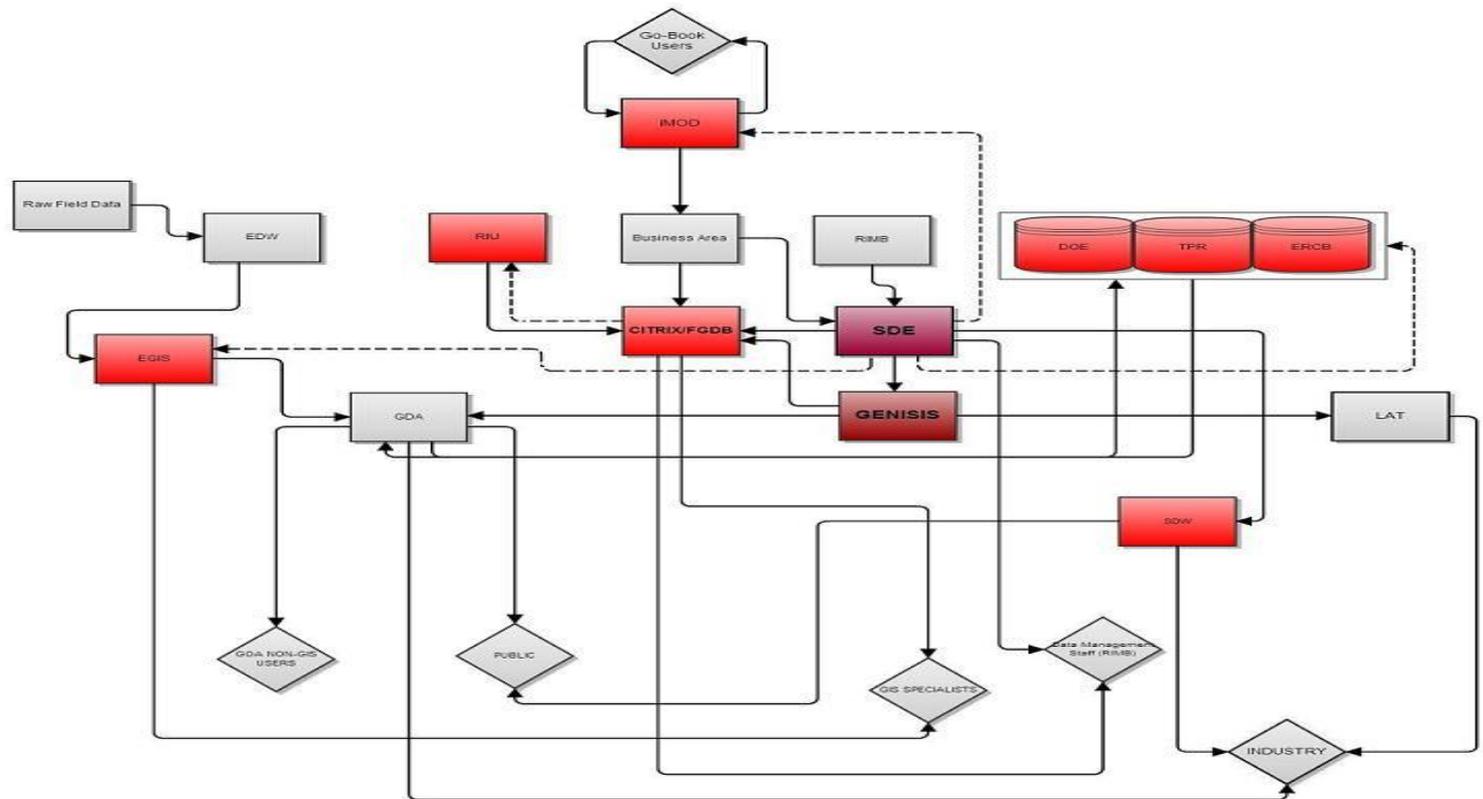


Water  
Management  
'Challenge'

**Need for environmental modelling**

# Challenge #2: Access to Authoritative Data Sources

The current status of GIS data in ESRD:



**Need for accessing authoritative data sources**

# Challenge #3: Data Preparation

60 - 80% of the time spent on data analytics projects is spent preparing the data for analysis, which often is:

- Repetitive
- Time consuming
- Laborious
- Costly
- Error prone

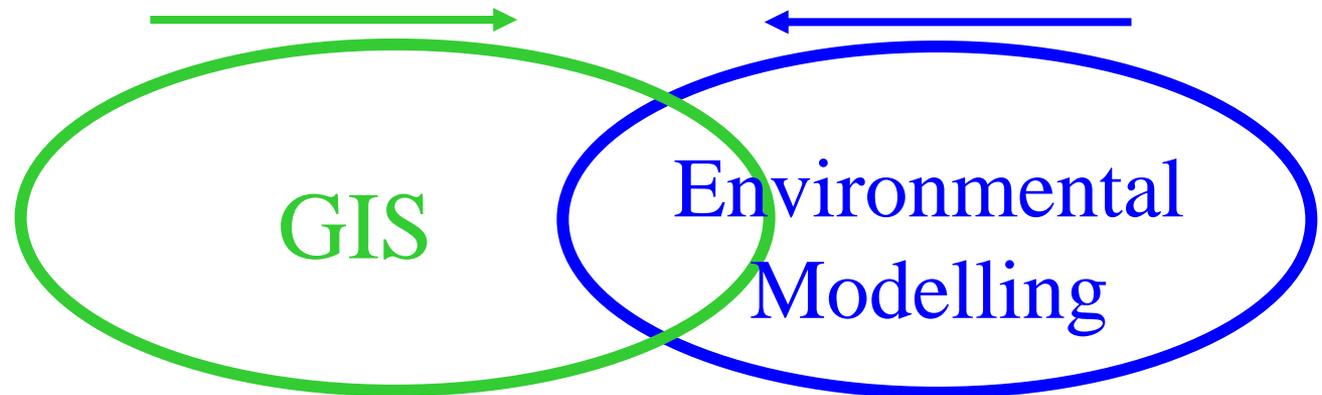


e.g. Watershed Modelling

**Need for automation of data preparation**

# Challenge #4: Integration with GIS

- There are trends in interfacing GIS with predictive water resource models. However, neither technology was initially developed to interact with the other (Martin et al., 2005).
- Lack of integration between spatial and temporal data/information.



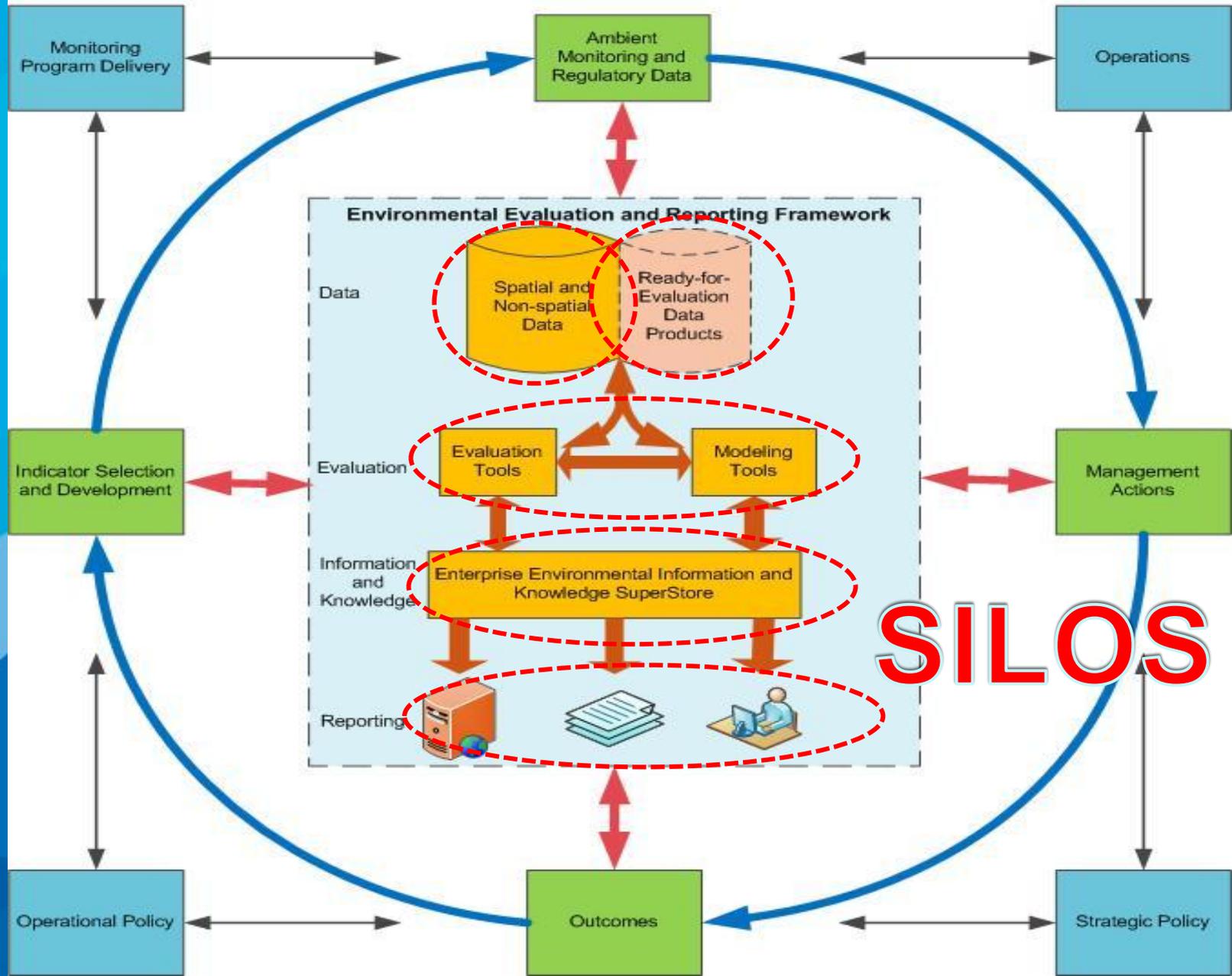
**Need for GIS-Modelling Framework**

# Challenge #5: Is Information and/or Knowledge Generated from a Project Readily Available/Accessible to Others?



**Need for Information & Knowledge Management**

# Challenge #6: Fragmented Silos



# Presentation Outlines

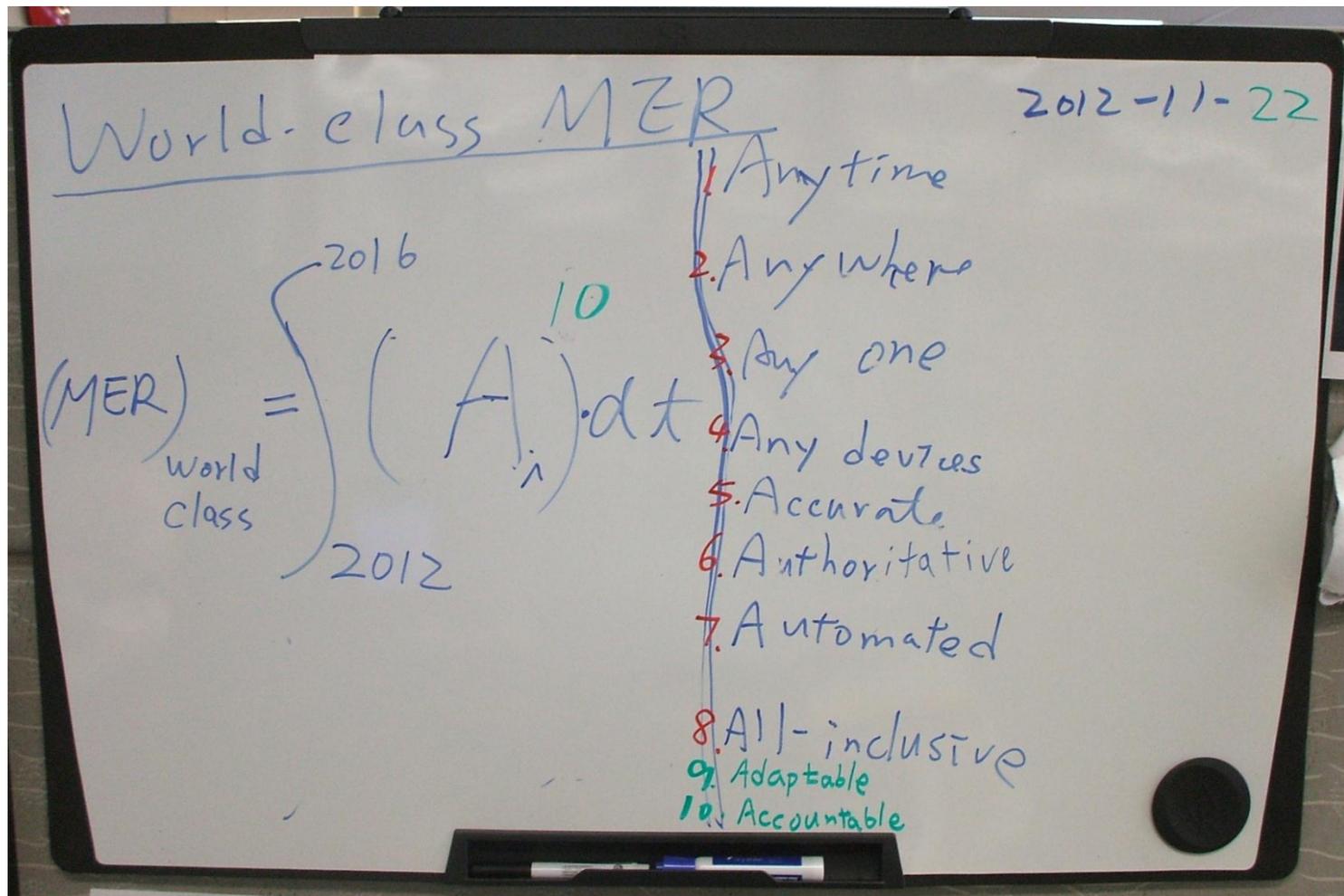
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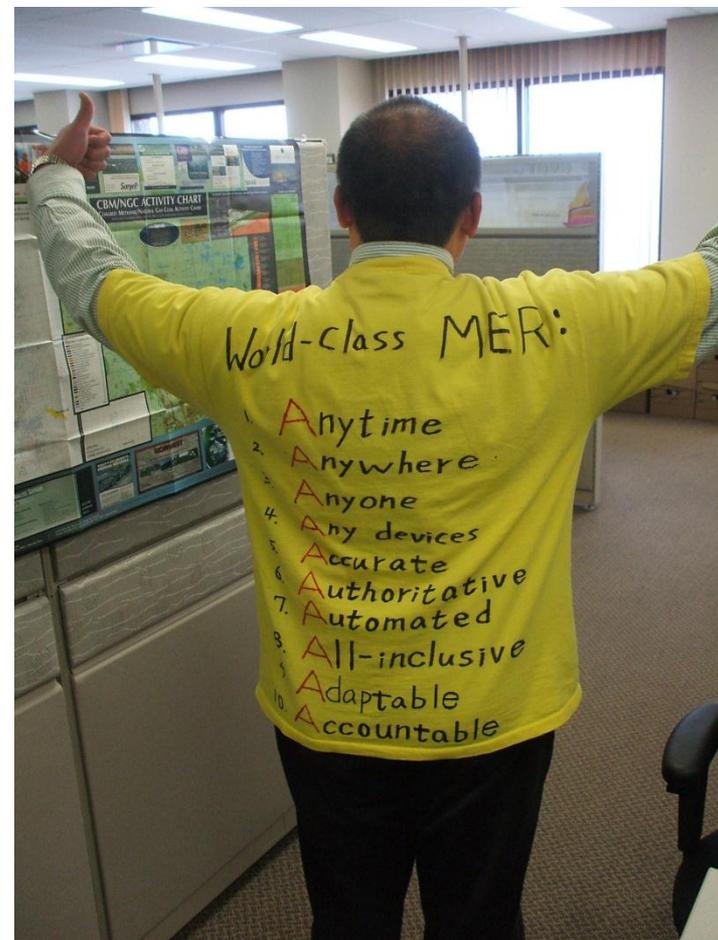


# World-Class Monitoring, Evaluation and Reporting (MER)

1. Anytime
2. Anywhere
3. Anyone
4. Any devices
5. Accurate
6. Authoritative
7. Automated
8. All-inclusive
9. Adaptable
10. Accountable



# Walk the Talk!



# Centralized Science and Modeling Computing Centre – Concept Diagram

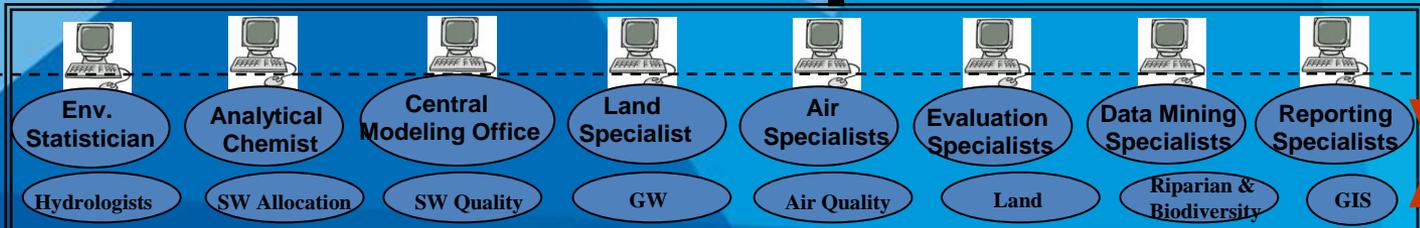
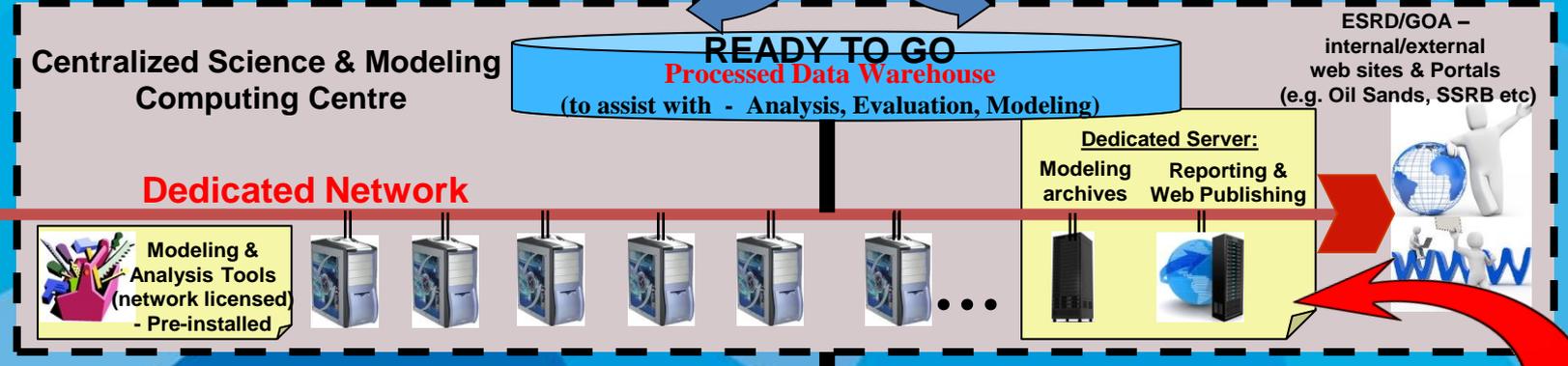
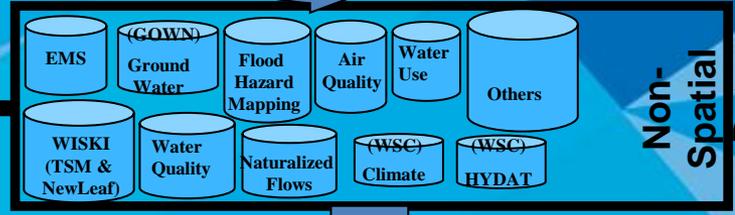
Alberta  
**DRAFT**

GOAESRD Network

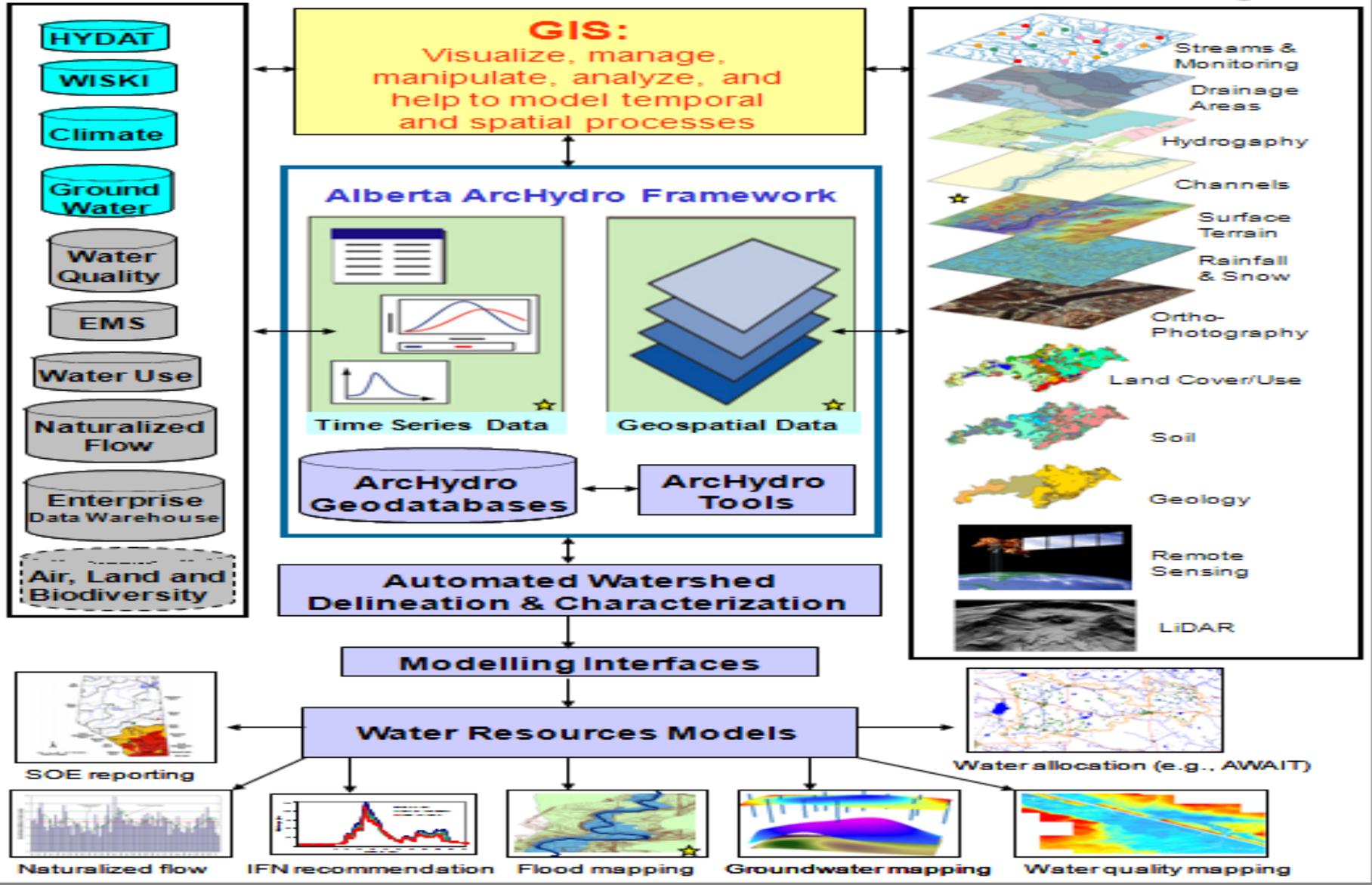
Monitoring Group

Data Management Group

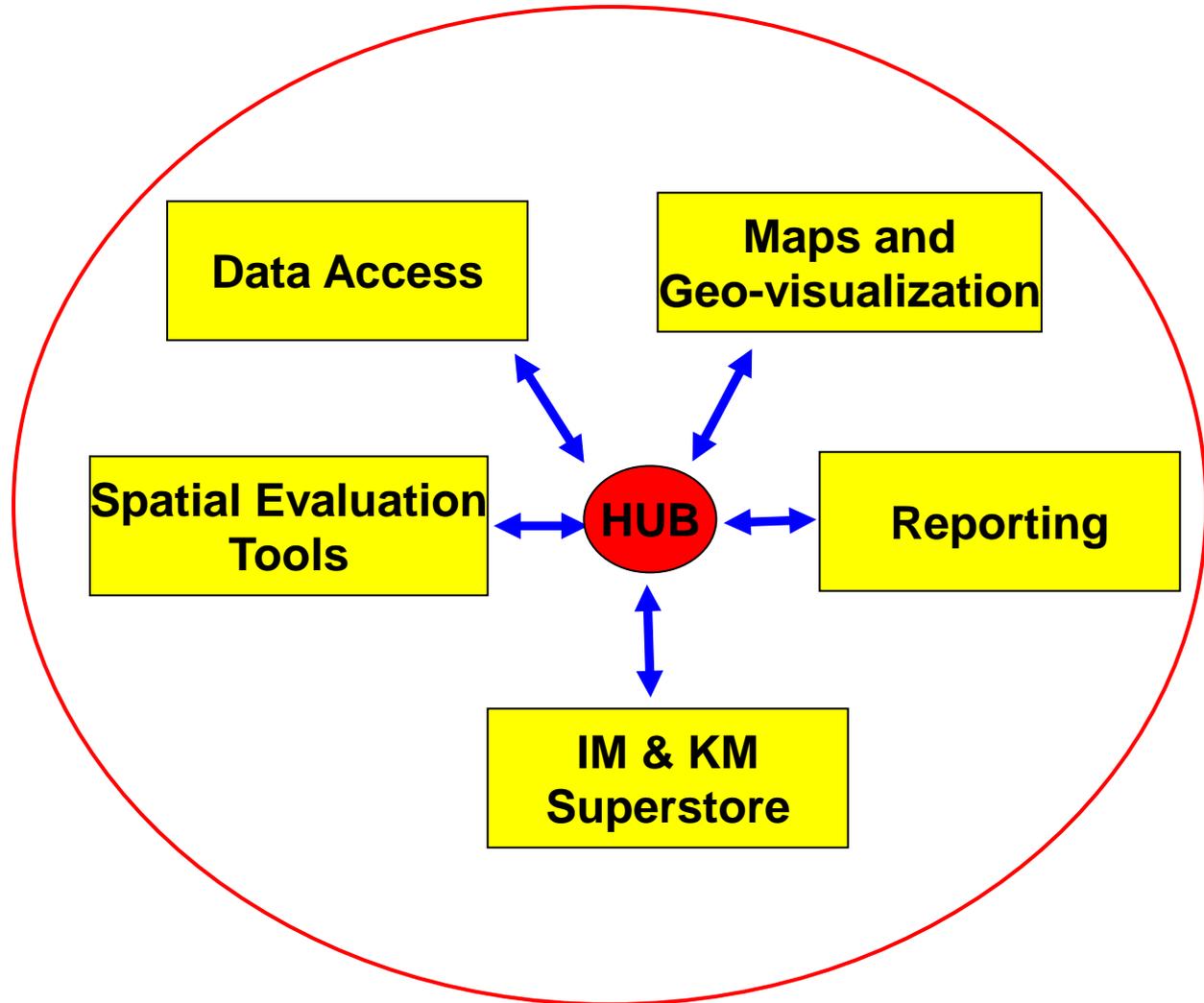
Centralized Science & Modeling Computing Centre



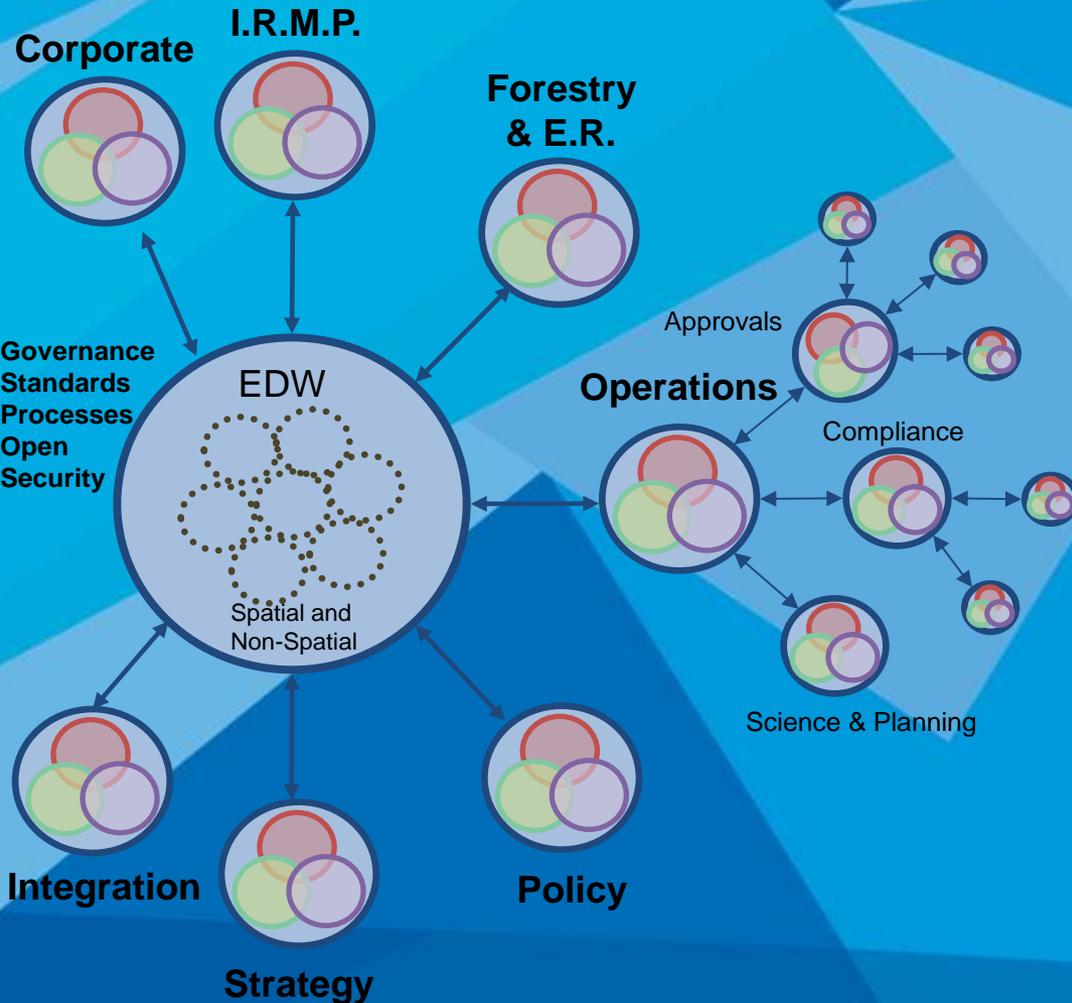
# ArchHydro as a Ready-To-Go Data Framework for Water Resource-Related Models



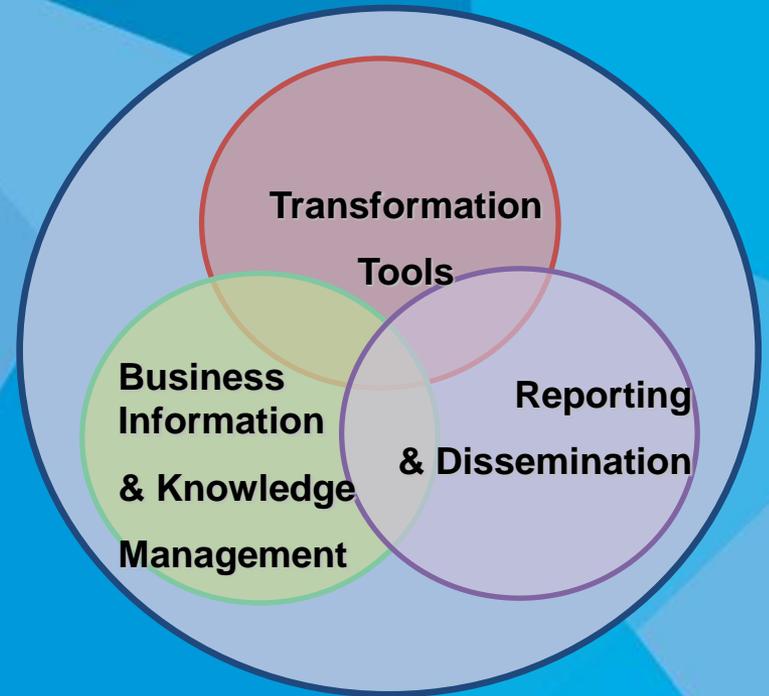
# Vision of (ES)<sup>2</sup>



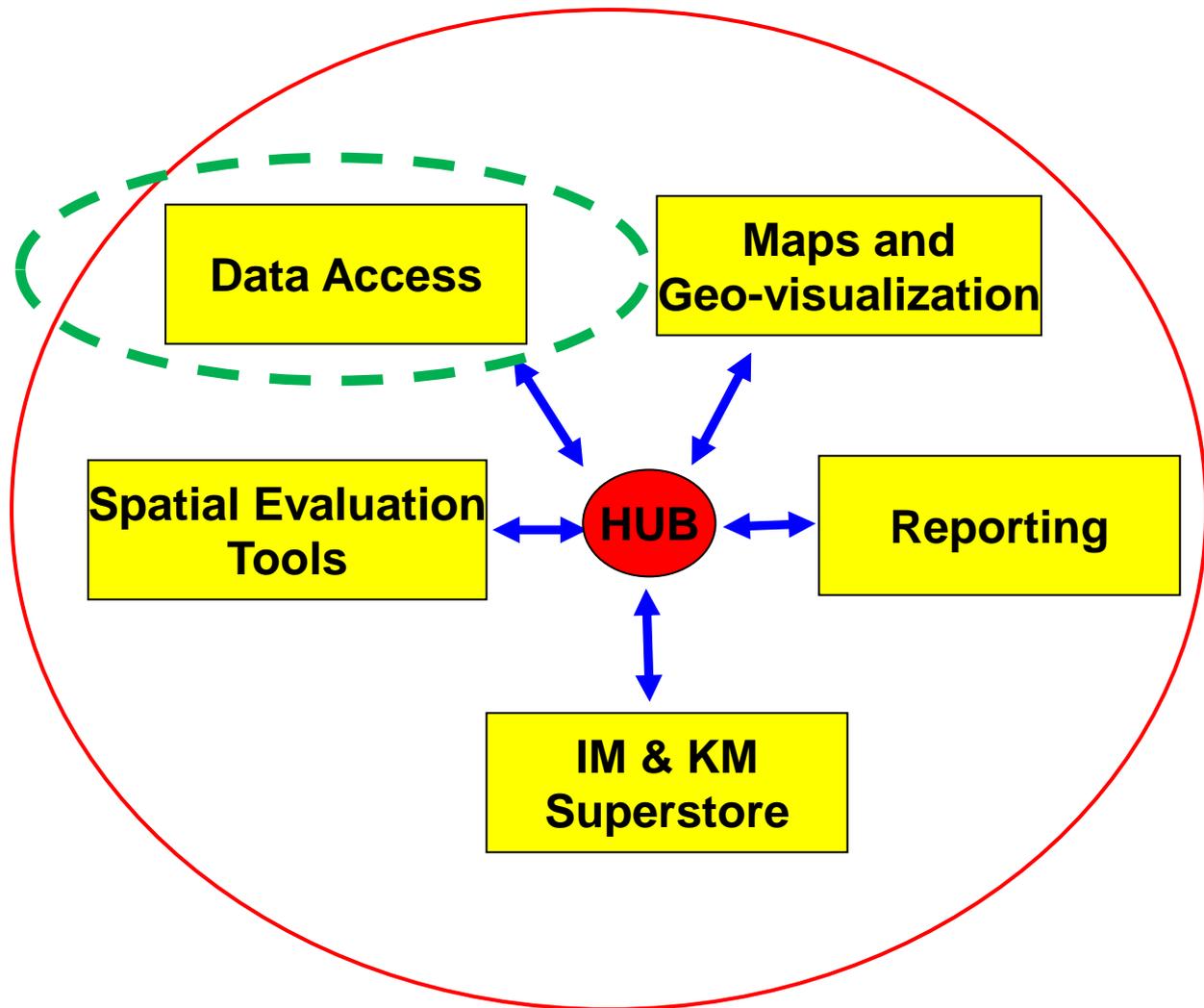
# (ES)<sup>2</sup> HUB



## HUB



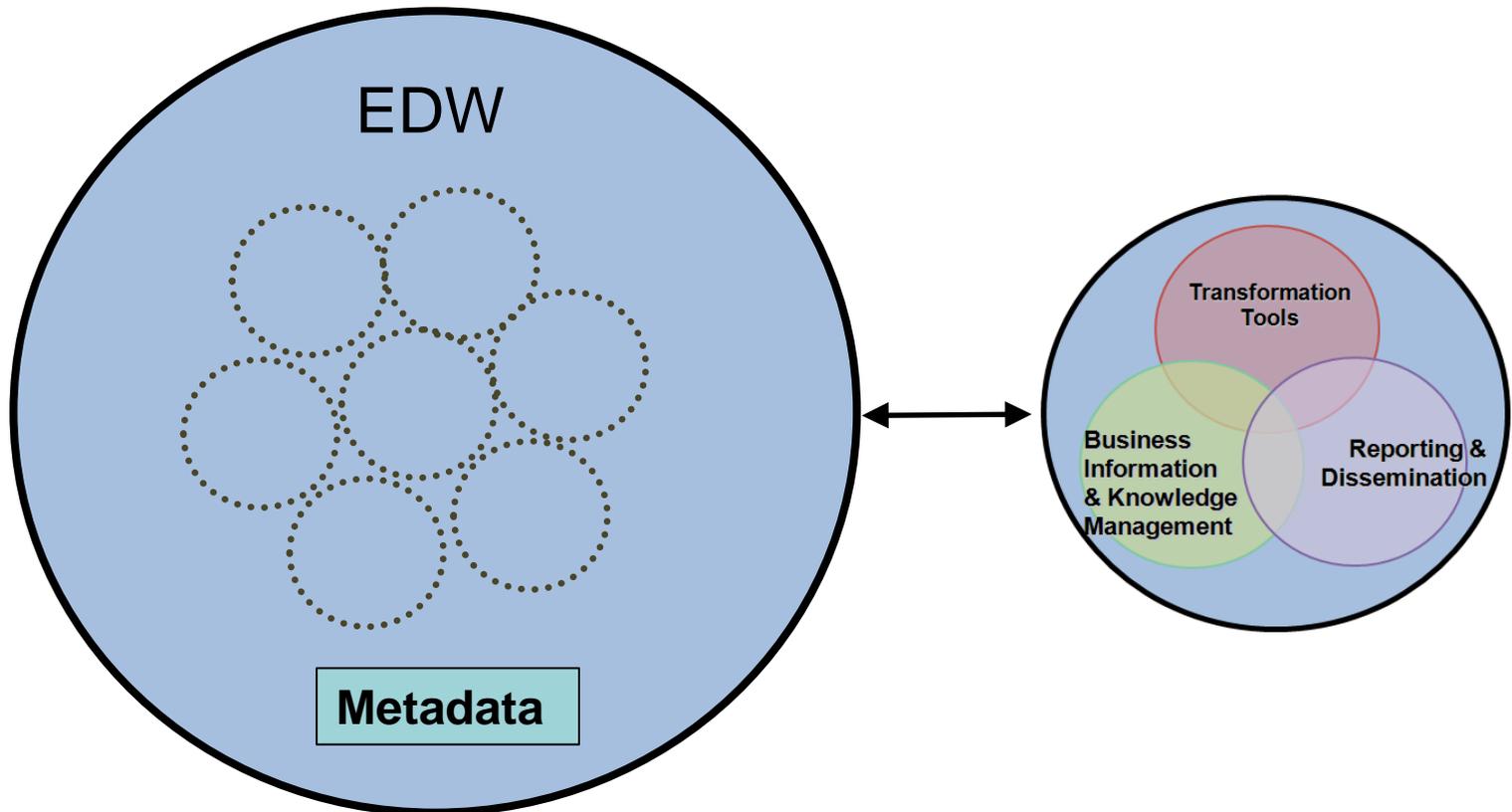
# Vision of (ES)<sup>2</sup>



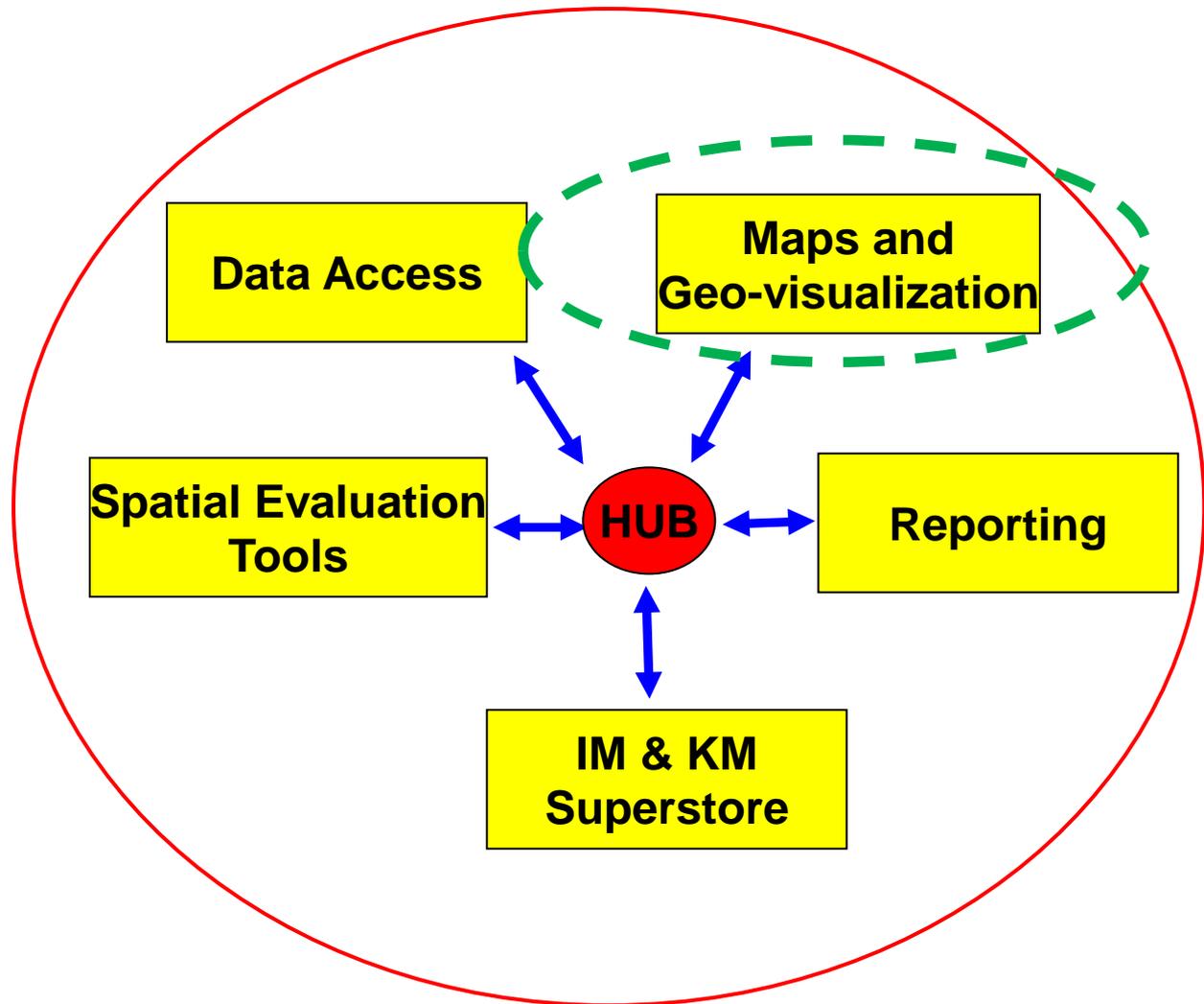
# Data Access: Access to all the available data layers from various authoritative sources, including ESRD, GDA, NRE Pod, and partners

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**Data Centric: Access to Authoritative Data, Spatial and Non-Spatial**

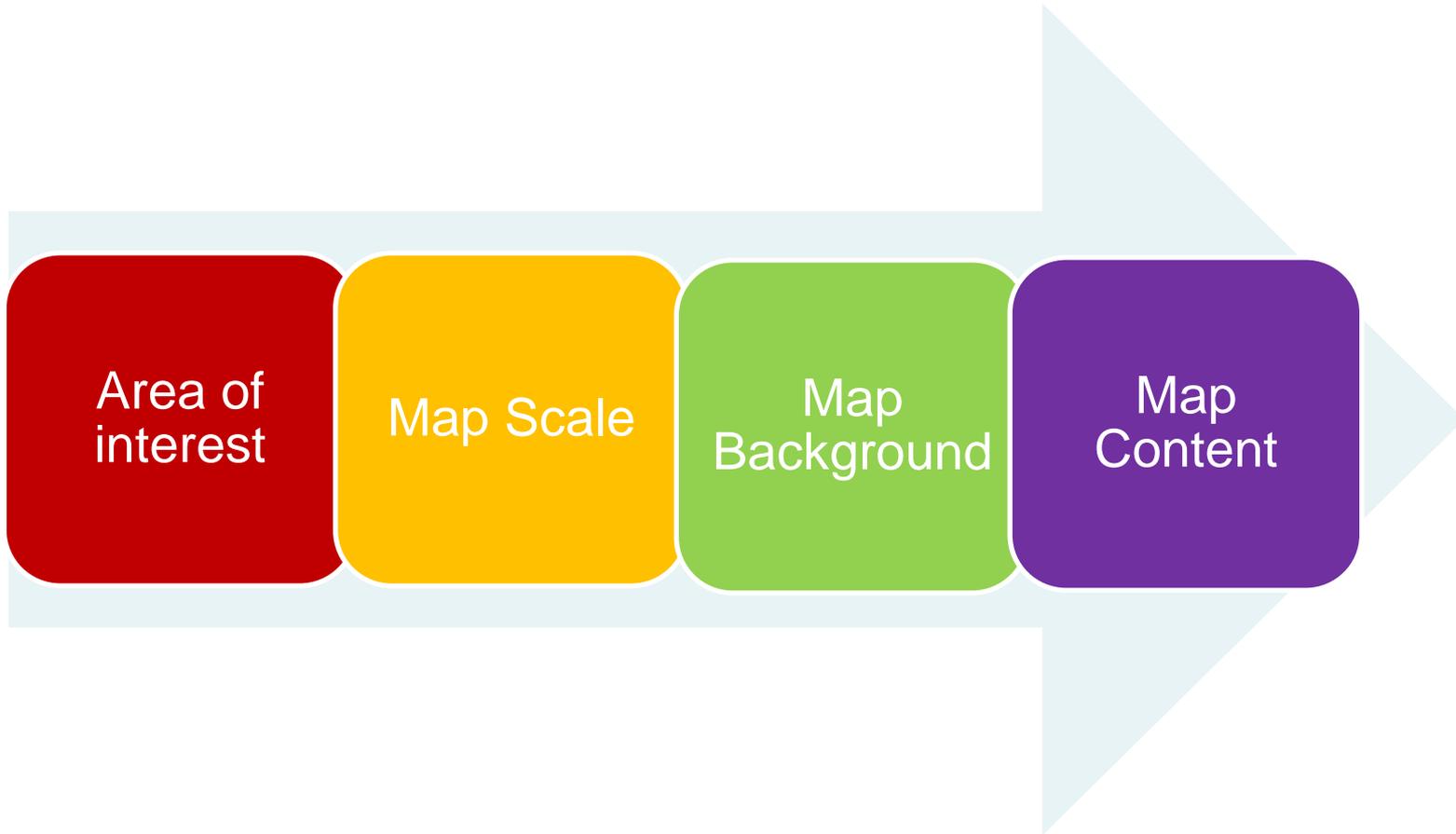


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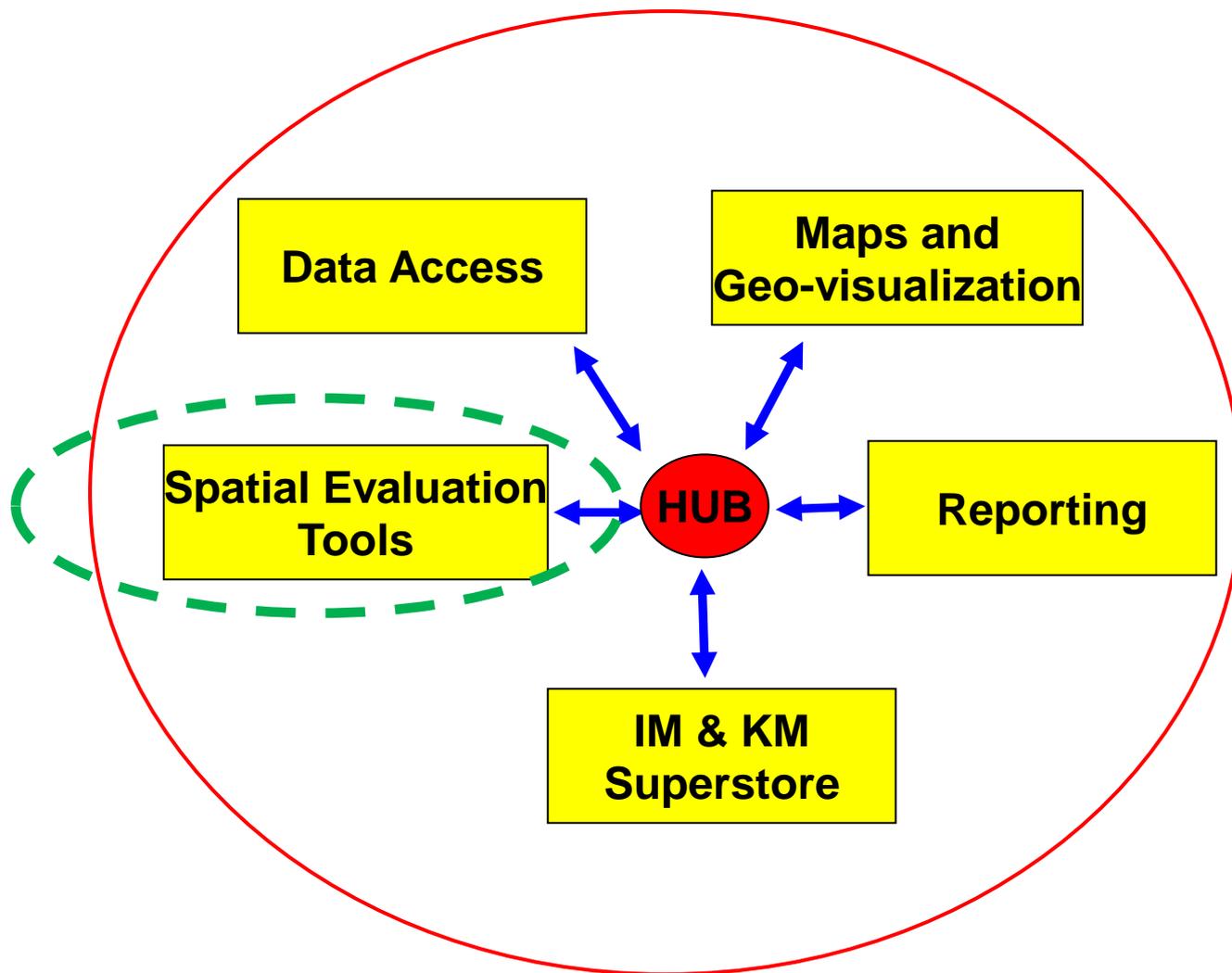


# Map and Geo-visualization: Automation of consistent cartographic, thematic maps at different scales

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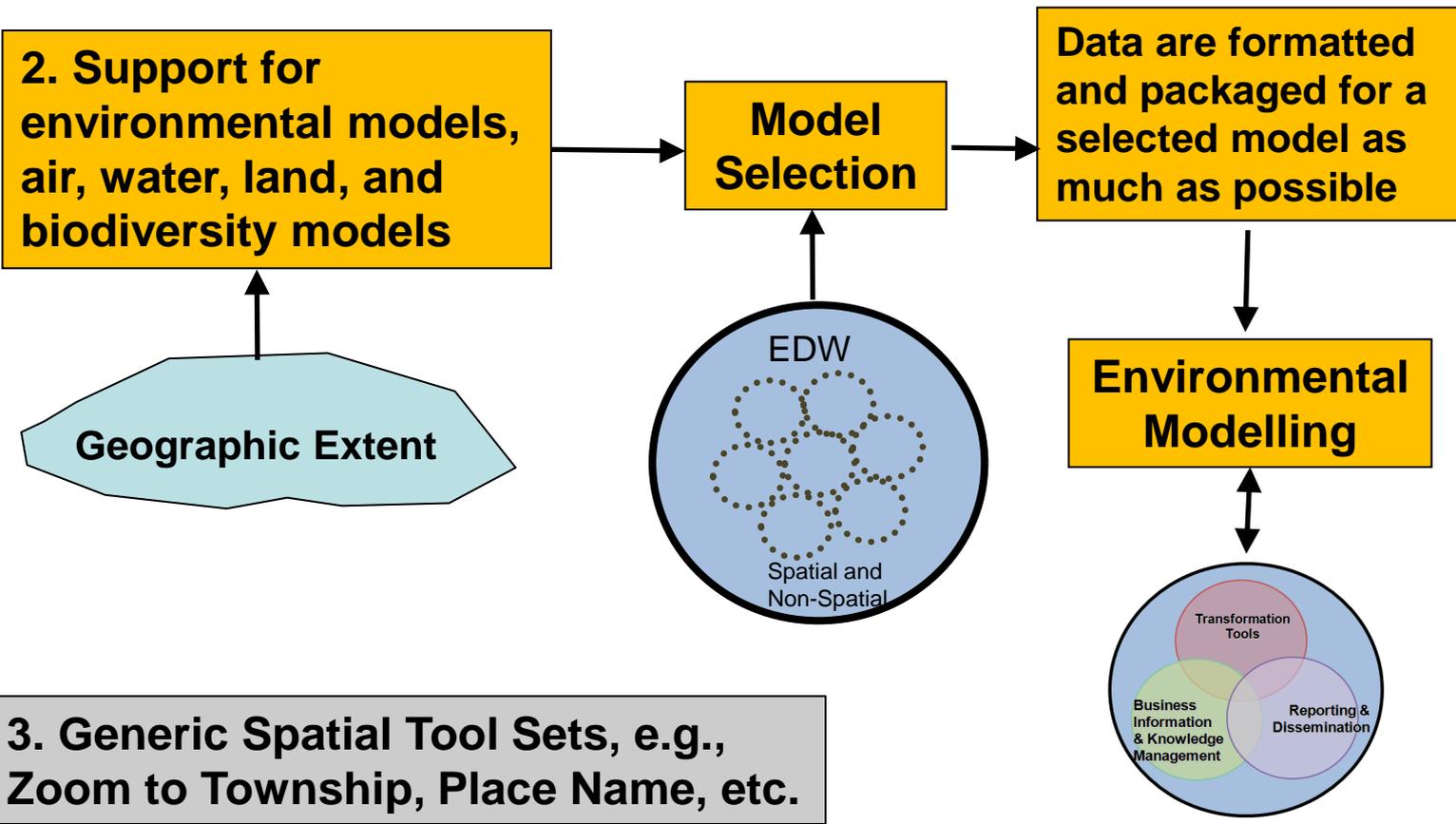


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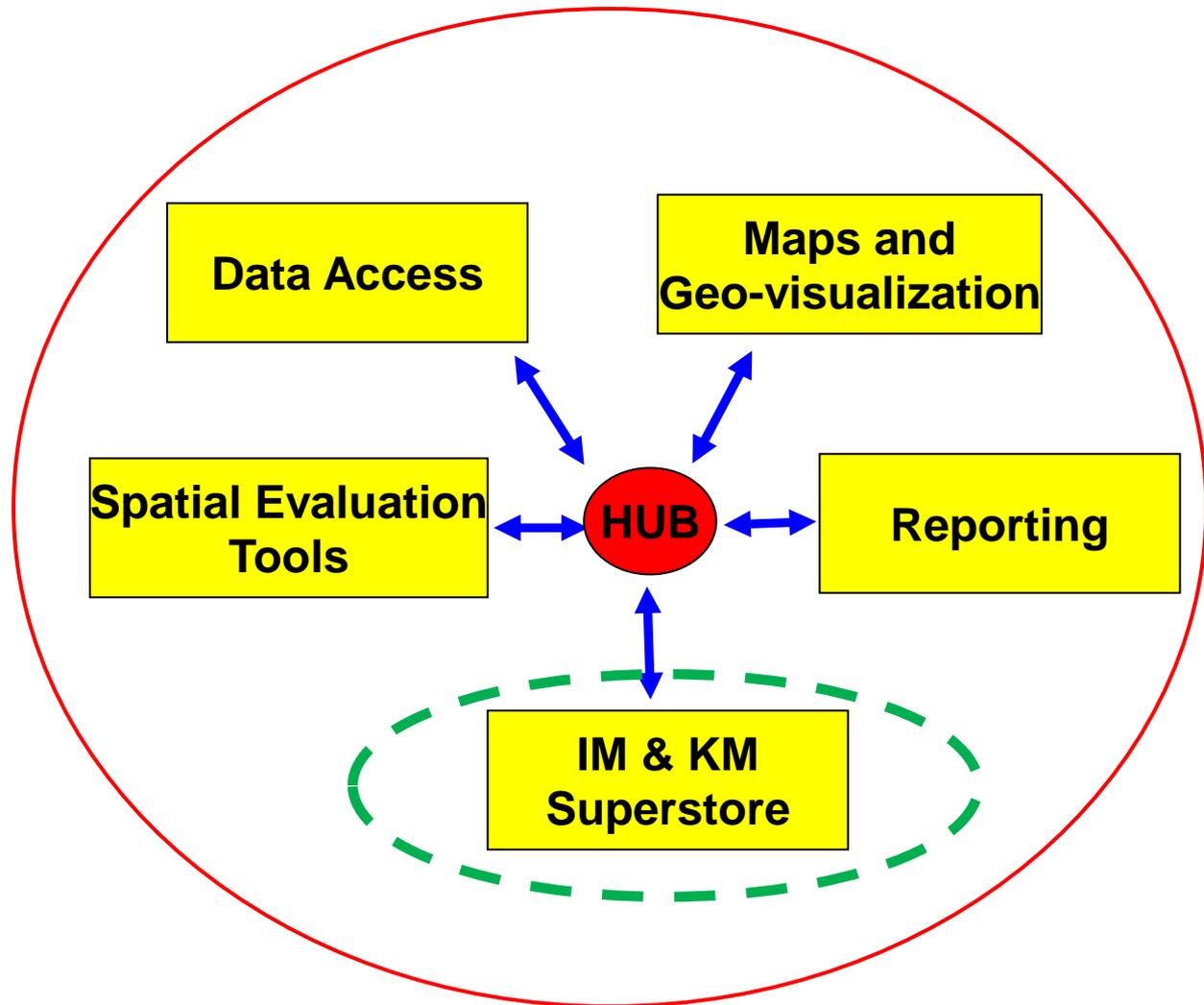
# Spatial Evaluation: Access to (1) business spatial evaluation applications, (2) support for spatial analytical models, and (3) generic spatial tool sets

1. Business Spatial Evaluation Applications, e.g., AWAIT, Mikisew, WESPAB , etc.

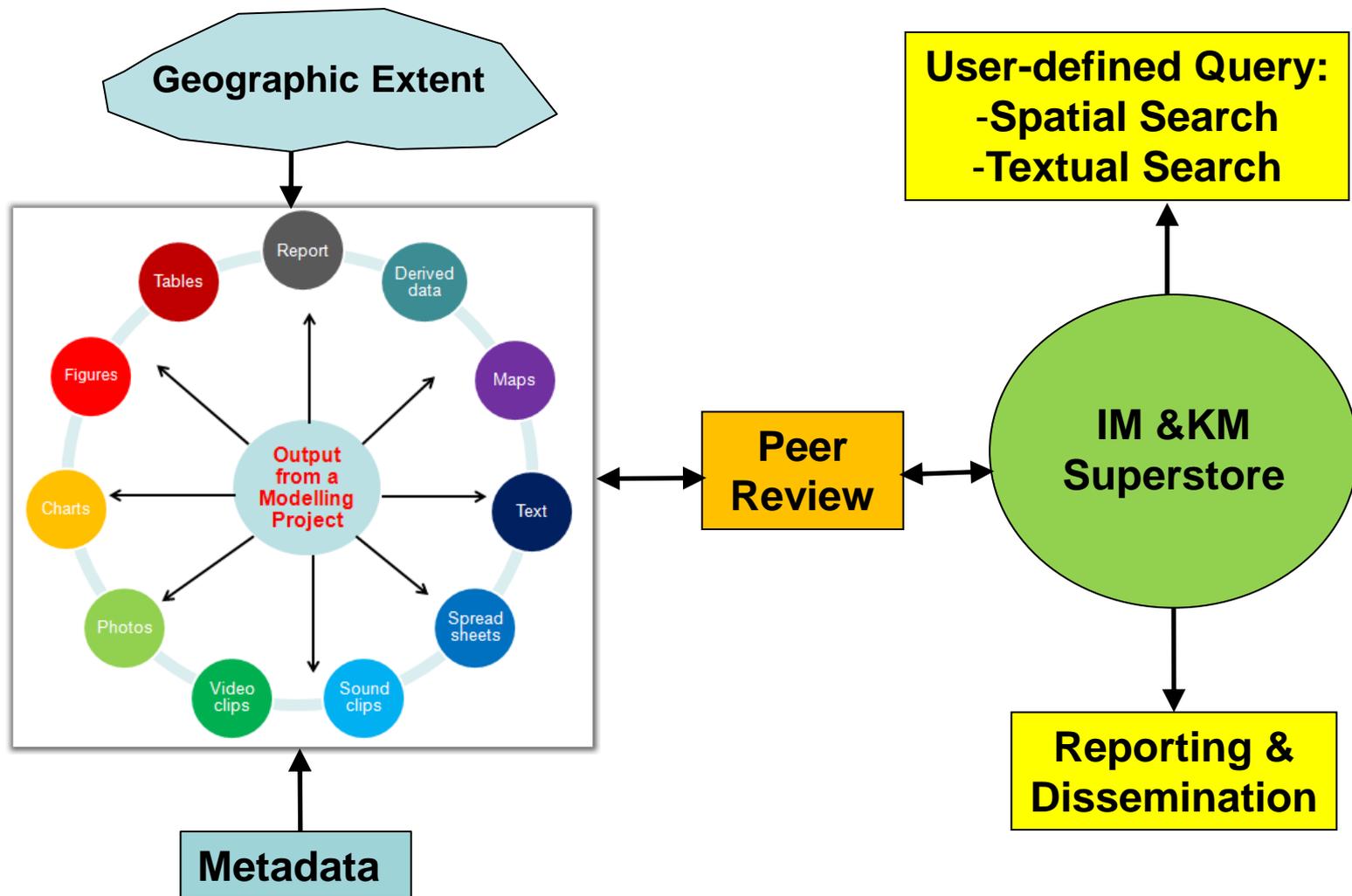


3. Generic Spatial Tool Sets, e.g., Zoom to Township, Place Name, etc.

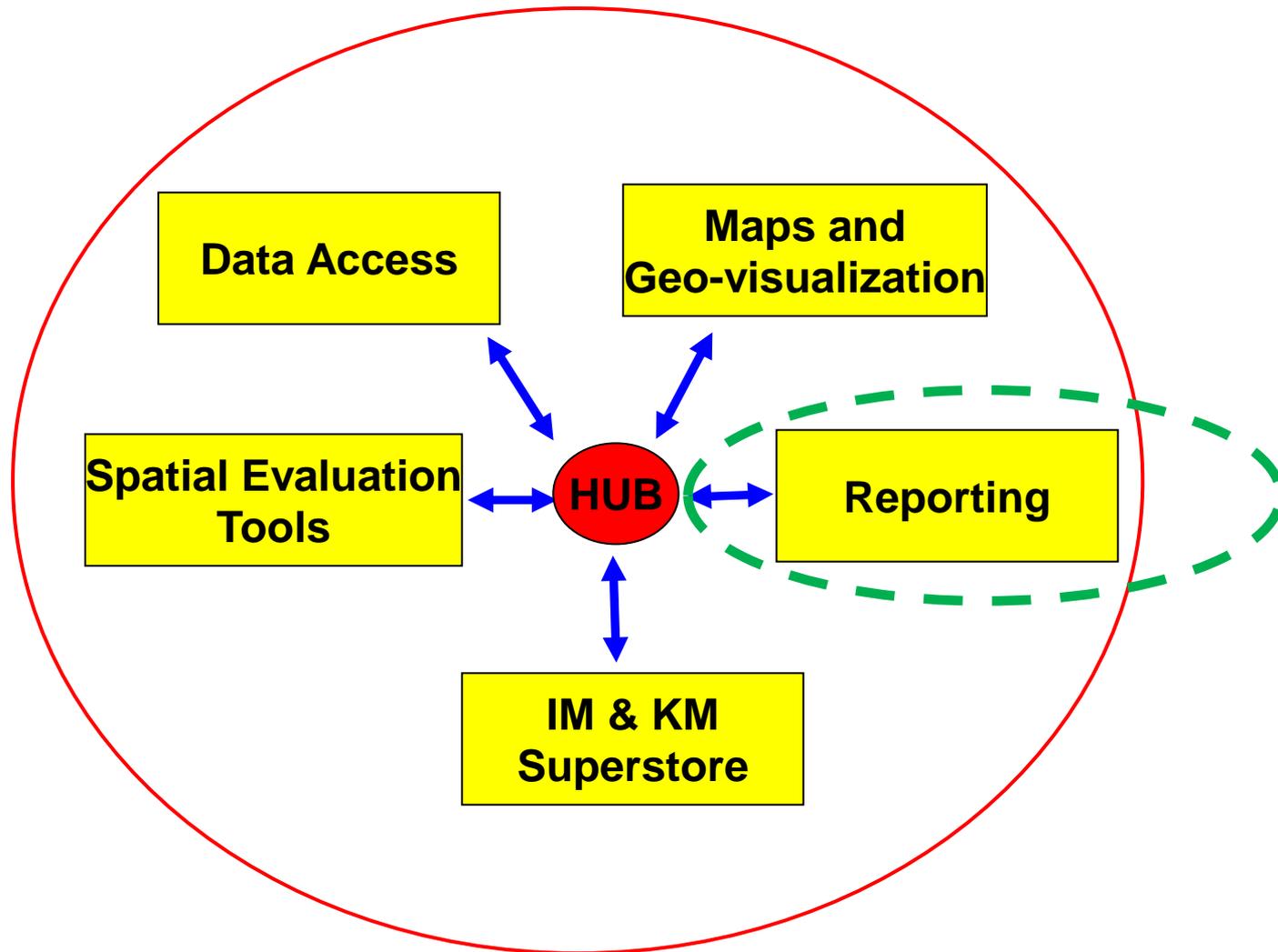
# Vision of (ES)<sup>2</sup>



# IM & KM Superstore: Spatially/Textually-searchable catalog to manage/store/access project-based derived information and expert knowledge (derived databases, maps, text, reports, spreadsheets, graphics, pictures, audio files, video clips, etc.)

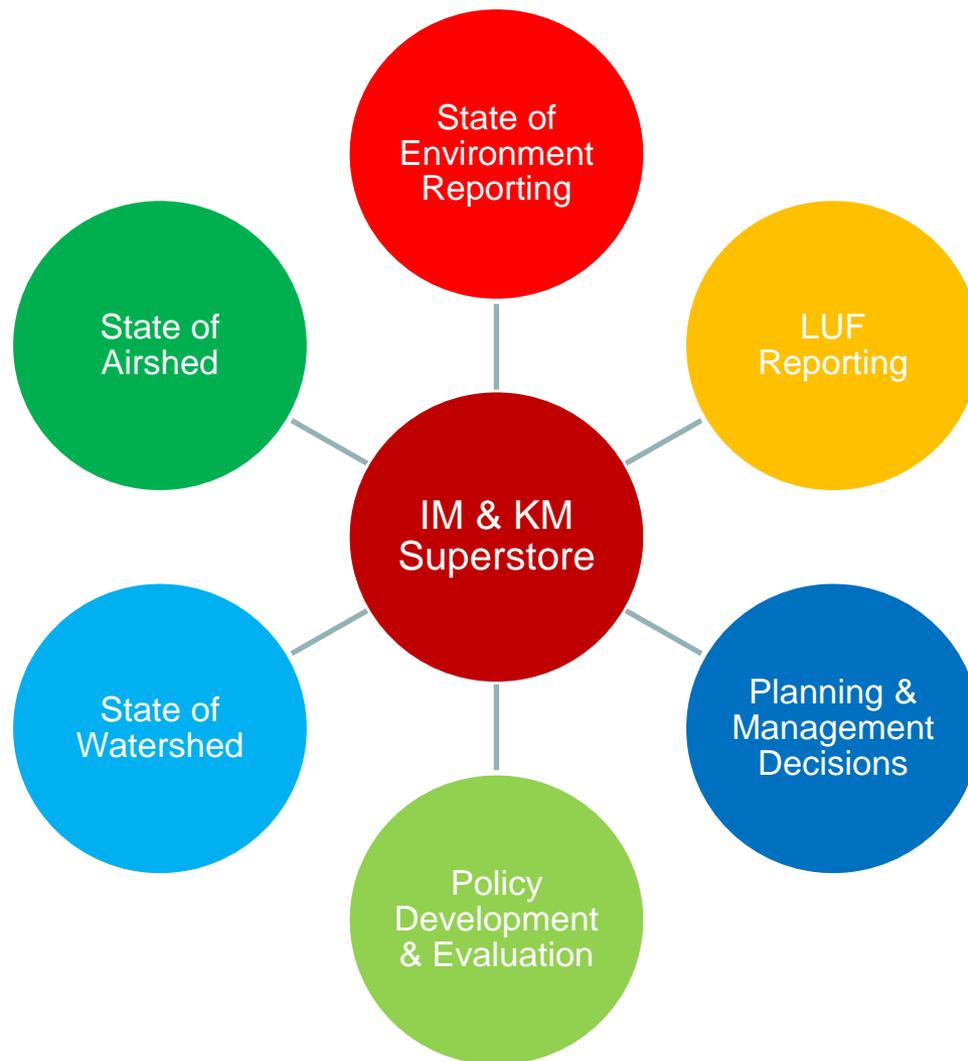


# Vision of (ES)<sup>2</sup>



**Reporting:** A spatially-searchable, open & transparent reporting system (a Story Teller) with an option for downloading relevant data and information

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# Benefits of (ES)<sup>2</sup>

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- Support business processes and management activities within CEMS, IRM, LUF.
- Support scientifically rigorous and defensible data, information and knowledge, i.e., putting the right data/information/knowledge, in the right format, in the right hands, at the right time.
- Support open data.
- Integrate various GIS functions.
- Align with the world-class Monitoring, Evaluation & Reporting vision.
- Support Alberta Monitoring Agency and Alberta Energy Regulator.
- Align with EDMS, including GeoDiscover Alberta.
- Achieve the goal of enterprise GIS (BPIT, 2011).

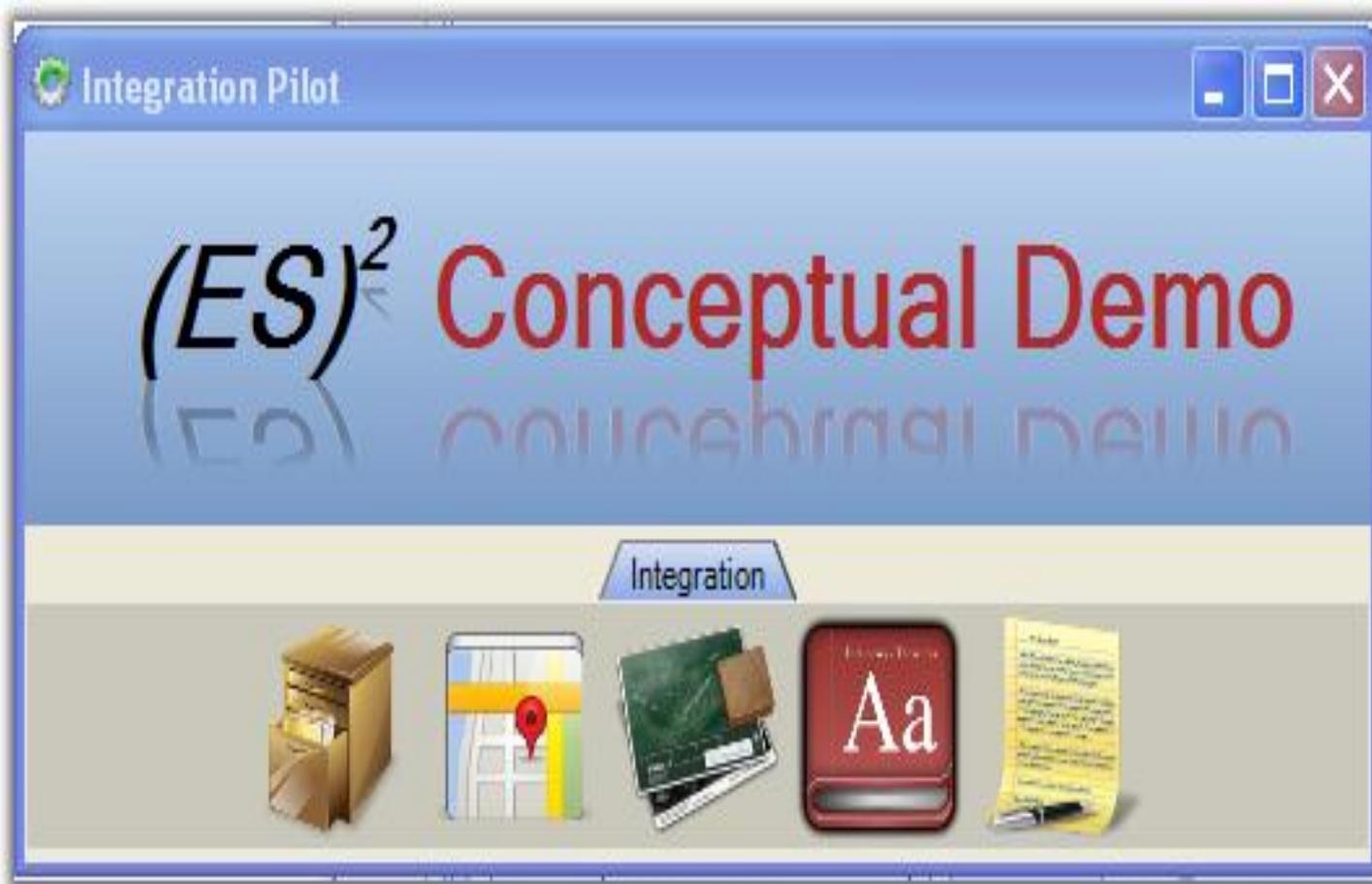
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# Conceptual Demo



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# (ES)<sup>2</sup> Can Make a Difference!

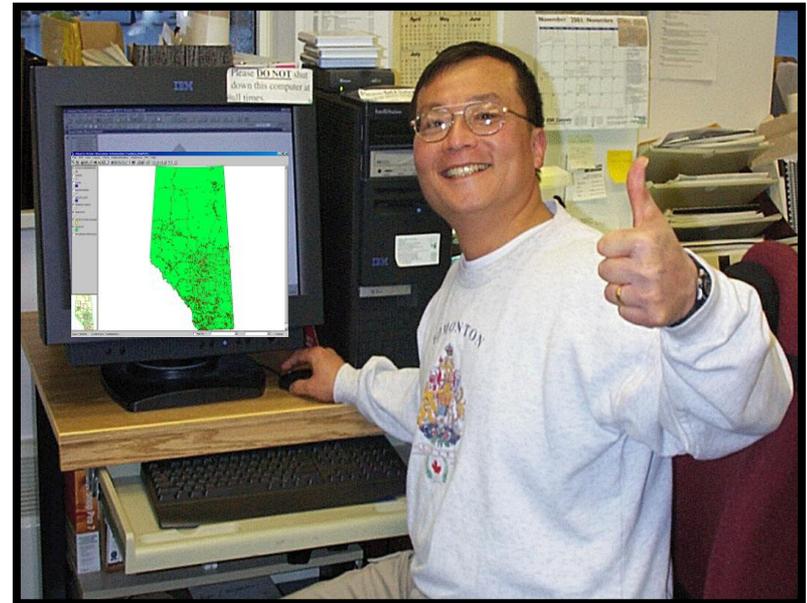
Without (ES)<sup>2</sup>

versus

With (ES)<sup>2</sup>

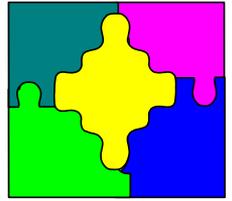


Stressful and frustrated modeler due to inaccessible data/tools and laborious, inconsistent, time-consuming, non-transparent, fragmented, and silo work.



Happy & productive modeler who are making meaningful contributions as a result of an efficient, effective, innovative, timely, informed, open, transparent, and credible enterprise spatial system.

# Summary



- 
- We have a vision to create a world-class Enterprise Environmental Spatial System (ES)<sup>2</sup> for Alberta.
  - We are excited and passionate to do the right thing, and we will strive to do it right through a journey of learning (and making mistakes!)
  - We need your support and engagement. By working together, we can make a difference!

# Thank You!

Q&A, Comments and Discussions



“A journey of a thousand miles begins with a single step. Just do it!”