

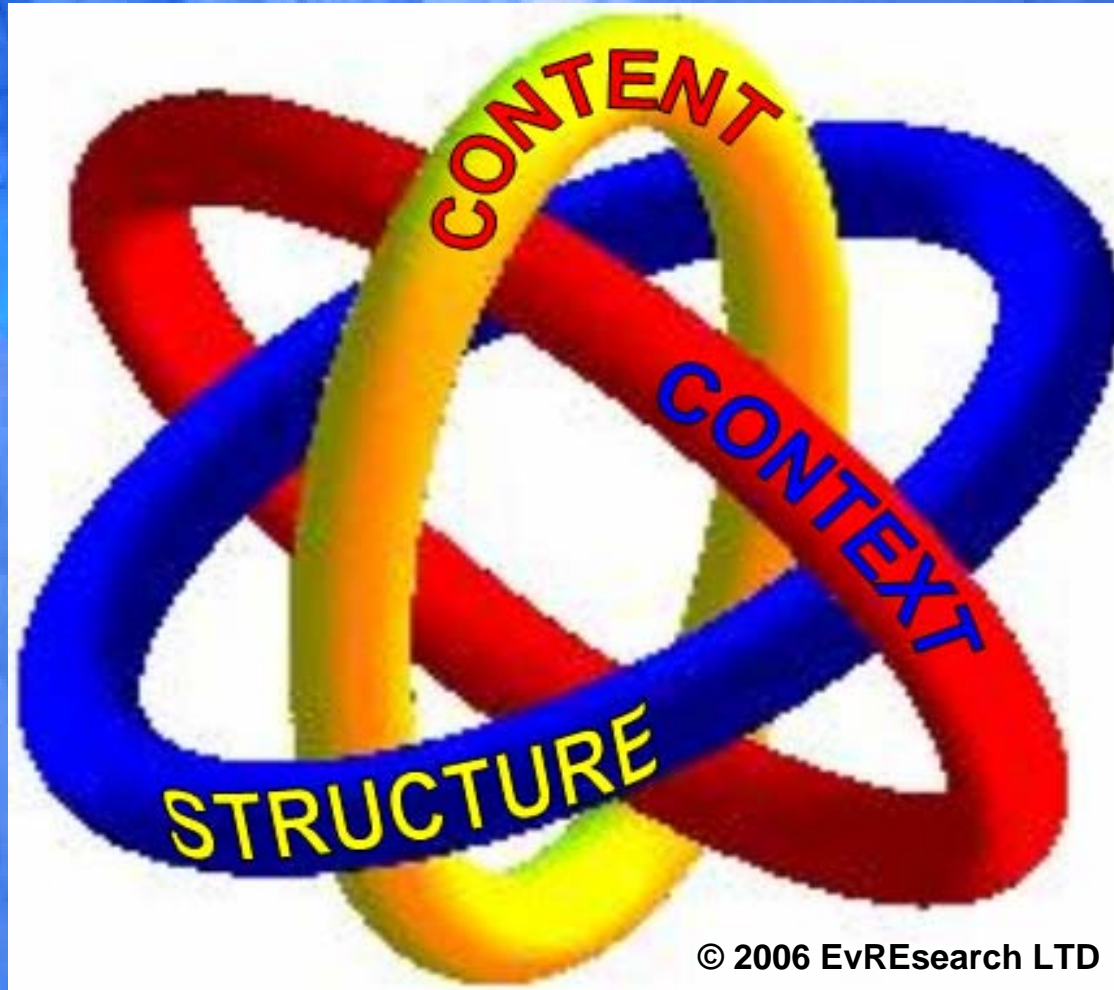
New Frontier in Defining the Data to Knowledge Paradigm

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INFORMATION ELEMENTS CREATE MEANING



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THE CHALLENGE OF OUR DIGITAL ERA

RESPOND TO THE FLOOD OF INFORMATION

>85%

UNSTRUCTURED INFORMATION

Information Resources

METADATA

DATABASE

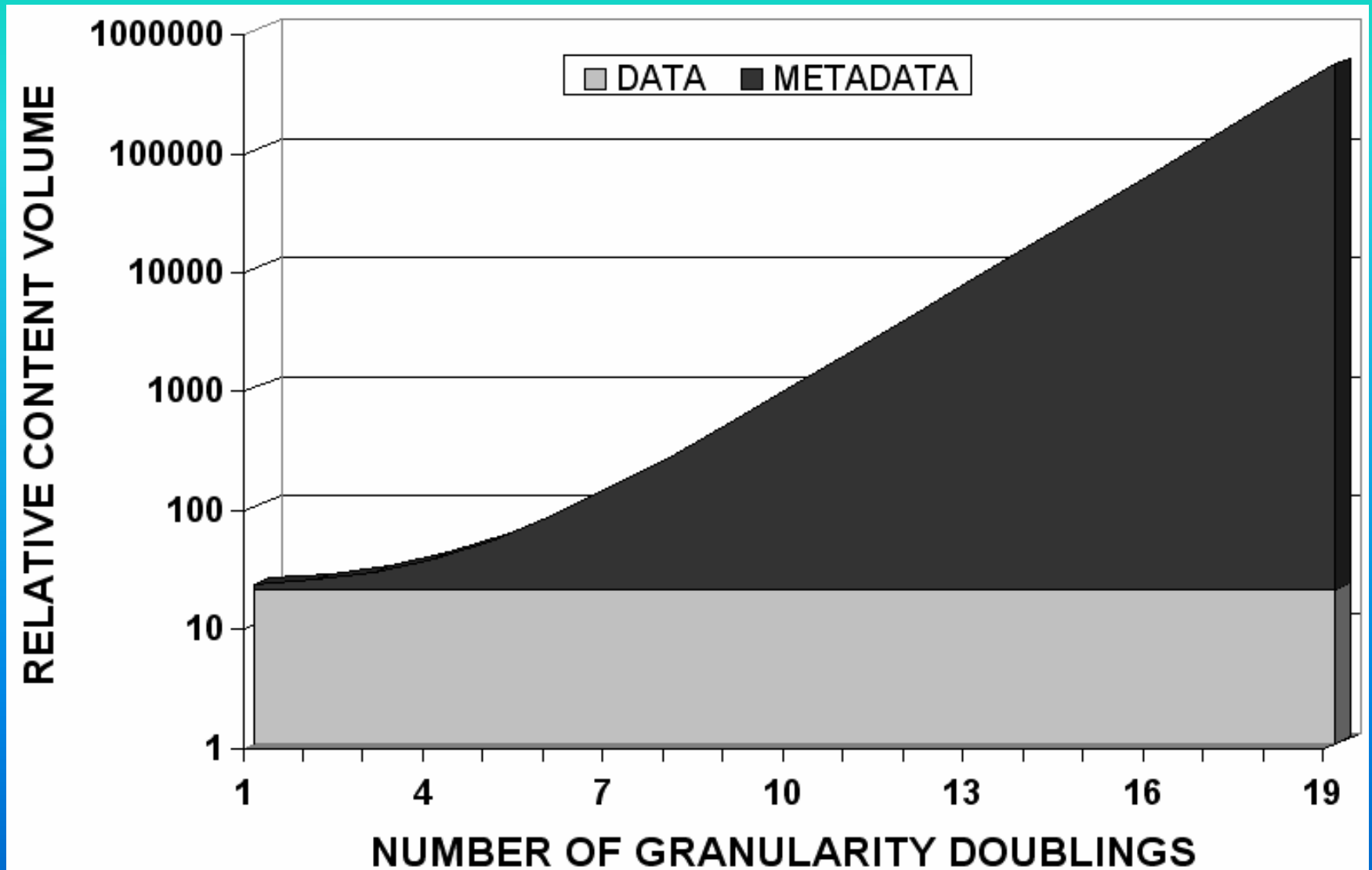
MARK-UP

STRUCTURED INFORMATION

Relational Schema

<15%

METADATA LIMITATIONS



ADDING VALUE TO METADATA

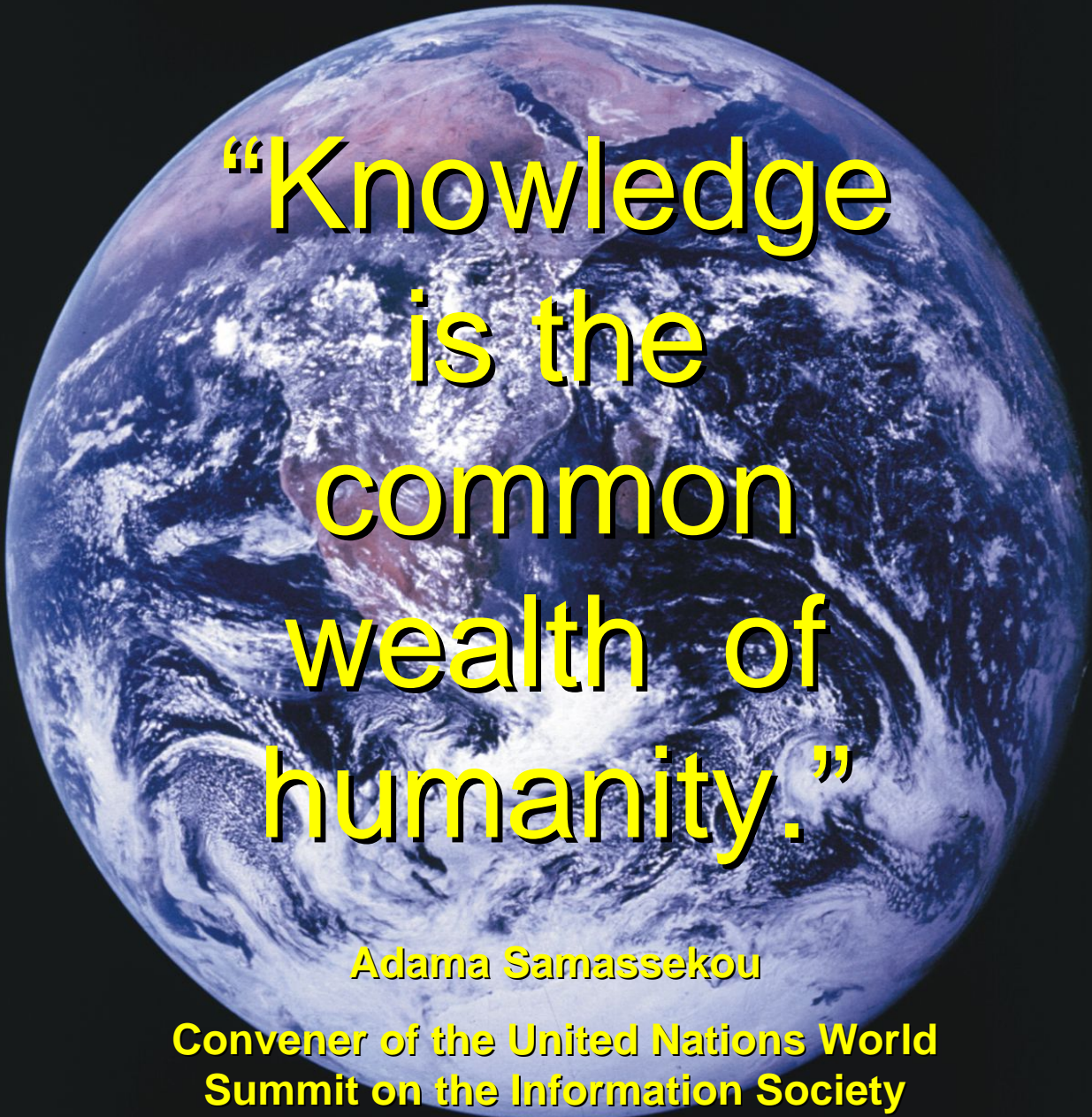
Rationale

- **Metadata is ubiquitous;**
- **Metadata contains subjective descriptions of content and context;**
- **Metadata requires significant and ever-increasing effort to produce and manage; and**
- **Metadata is designed to facilitate access rather than discovery of relationships.**

THE GOAL OF THIS WORKSHOP is to plan an international experiment that integrates Earth system data from at least two highly disparate data centers (one of which may be a World Data Center).

The experiment would:

- a. Enable data from centralized repositories to be dynamically and objectively integrated;
- b. Derive meaningful relationships within and between data resources; and
- c. Facilitate the discovery of knowledge to address a well-defined Earth system problem.

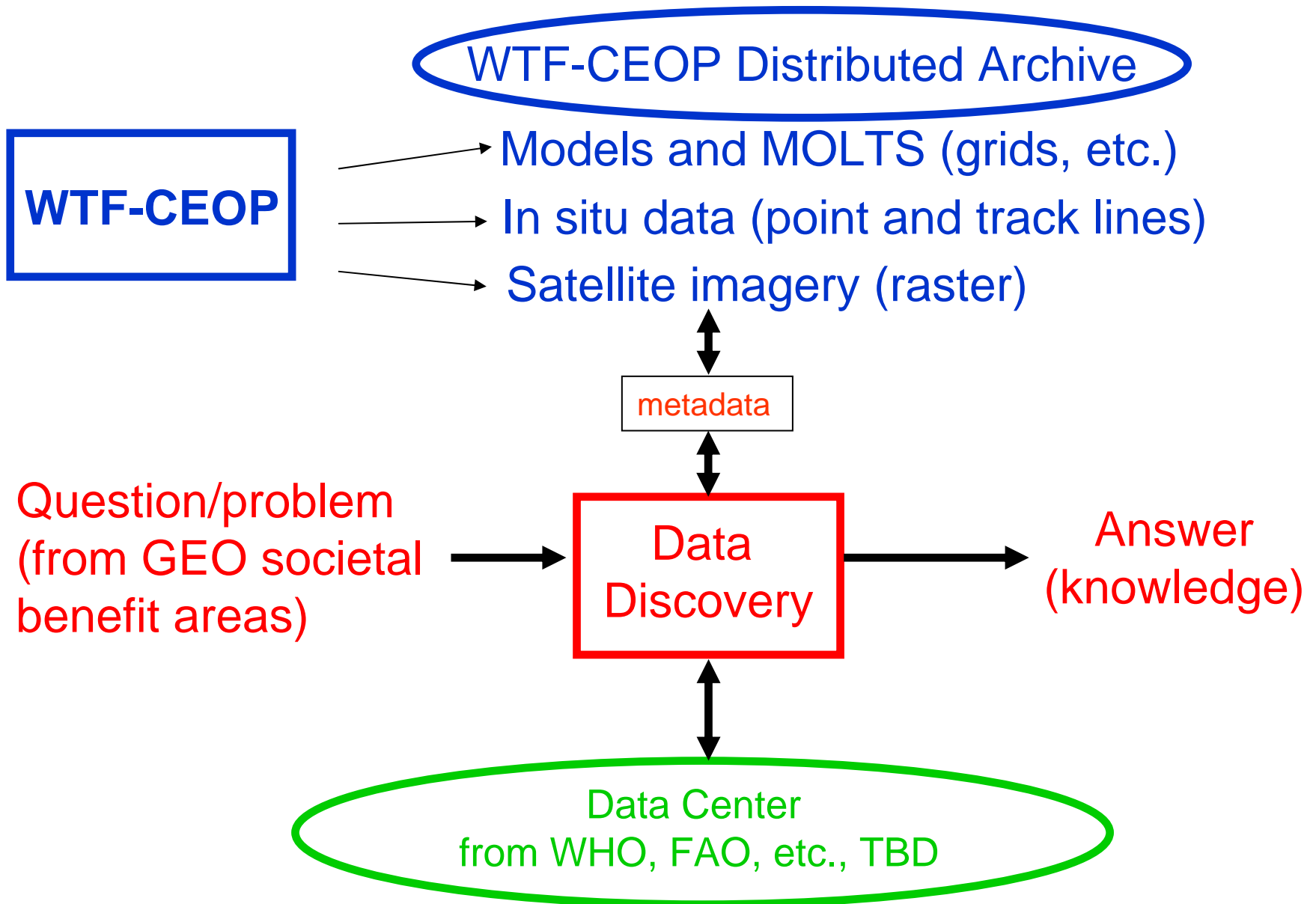


**“Knowledge
is the
common
wealth of
humanity.”**

Adama Samassekou

**Convener of the United Nations World
Summit on the Information Society**

Experiment schematic with examples of possible data sources



GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS (GEOSS) SOCIETAL BENEFIT AREAS

- disasters**
- health**
- energy**
- climate**
- water**
- weather**
- ecosystems**
- agriculture**
- biodiversity**

POTENTIAL PHASES OF THE EXPERIMENT

1. Demonstrate that metadata can be repurposed in an interoperable manner
2. Use repurposed metadata to identify relationships between datasets
3. Link repurposed metadata to actual datasets in relational contexts
4. Enhance granularity of datasets directly to interpret relationships within and between datasets
5. Elaborate the process of adjusting the granularity for additional interpretations

PHASE 1 OF THE EXPERIMENT

Objective: Demonstrate interoperability and value added of metadata that has been repurposed with automated granularity.

Experimental Design: The metadata and associated digital objects would be selected based on a specific experimental framework associated with GEO-GEOSS societal benefit areas.

Experimental Methods: Utilize general structural features of metadata (e.g., colon ":" as a boundary condition / rule set) as well as common elements (e.g., ISO standards) to automate the granularity for dynamically relating elements within and between metadata records .

What we hope to accomplish today

- **Begin to frame a GEO societal question or issue which can be addressed by the experiment**
- **Identify potential participants in the experiment**
- **Develop a roadmap or game plan for the next steps (this workshop is the 1st activity)**

QUESTIONS!

ADDING VALUE TO METADATA EXPERIMENT

METADATA SCHEMA				
	WTF-CEOP	International Organization of Standardization (ISO)		
Content	Reference Site Items	Metadata Section	Metadata Entity	Metadata Element
Contact(s)				
Dataset Overview				
Instrumentation Description				
Data Collection and Processing				
Quality Control Procedures				
Gap Filling Procedures				
Data Remarks				
Reference Requirements				
References				

EXAMPLE OF METADATA STRUCTURE

```
MD_Identification:  
  citation:  
    CI_Citation:  
      title: Site  
      date:  
        CI_Date:  
          date: 2004/04/07  
MD_BrowseGraphic:  
  fileDescription: Map of the area  
  fileType: JPEG  
DQ_DataQuality:  
  report:  
    DQ_Element:  
      nameofMeasure: Sensor  
      measureDescription: Operational radiosonde measurements  
processStep:  
  LI_ProcessStep:  
    description:  
      (1) Humidity  
      (2) Wind speed and direction  
      (3) Precipitation  
      (4) Soil moisture  
      (5) Soil Heat Flux  
      (6) Turbulent Fluxes  
      (7) Energy Budget Closure
```