



# 712CD

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Original title on 712 A/B:

Data Mediation Using SEDRIS

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# Report Documentation Page

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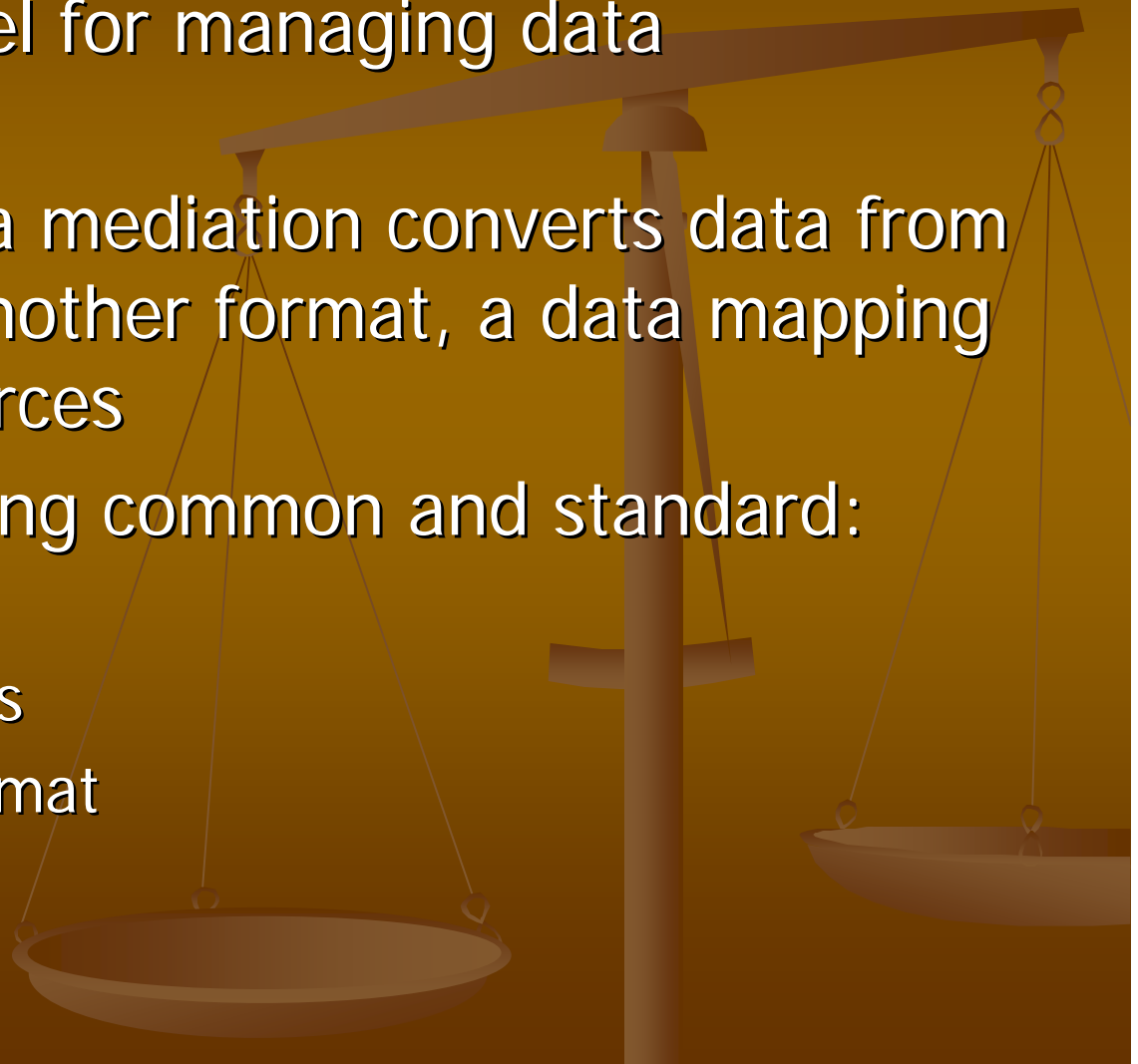
# Data Mediation Using SEDRIS



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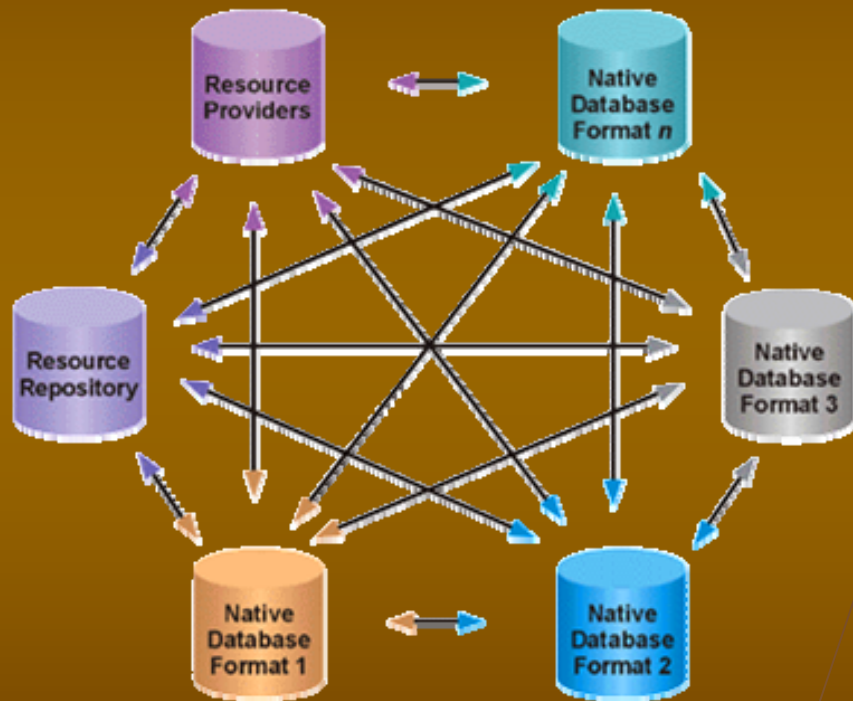
# Data Mediation

- A formalized model for managing data heterogeneity.
- More simply: data mediation converts data from one format into another format, a data mapping between data sources
- Facilitated by having common and standard:
  - Semantics
  - Dictionary of terms
  - Interfaces and format



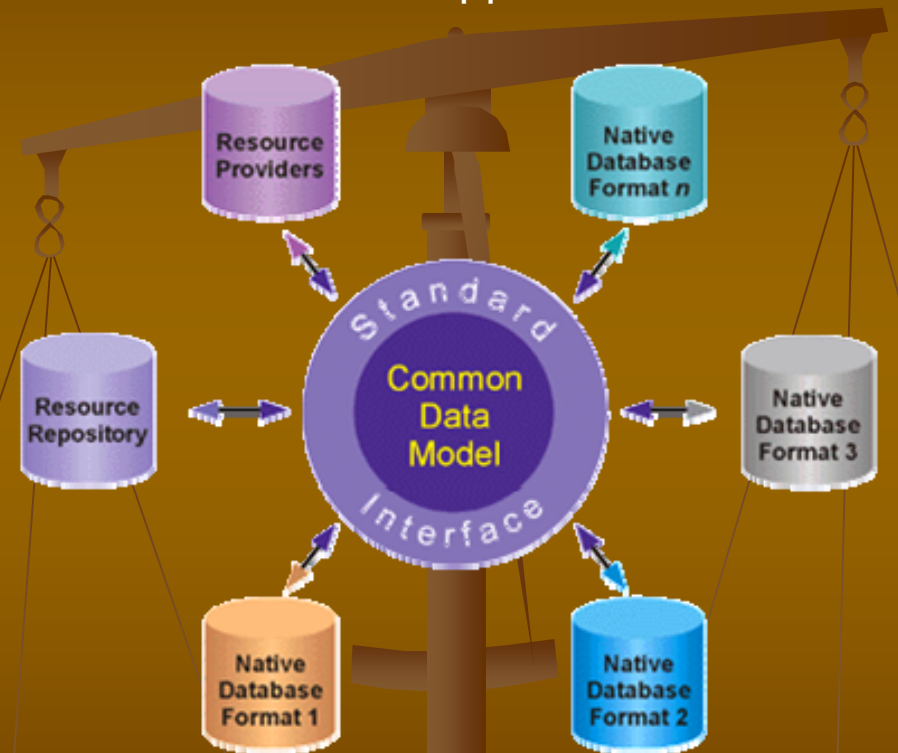
# Adopting A Middleware Approach

Data mediation nightmare



- Expensive and time consuming
- Often unreliable and non-interoperable
- Unique conversion needed for each source

Sane approach



- Significant reduction in conversion cost
- Common and open standards, tools, and software reuse

# SEDRIS ISO / IEC Standards

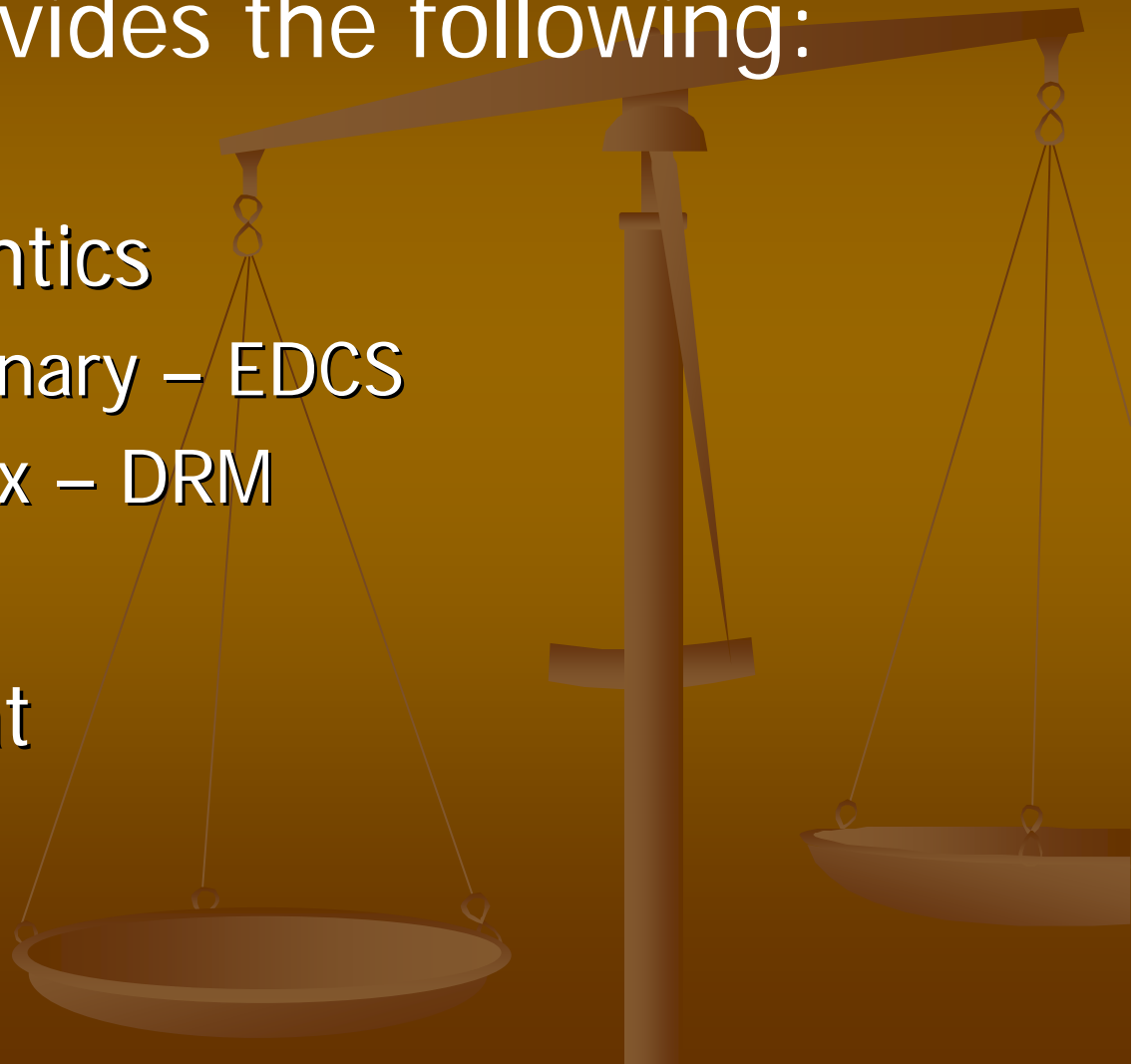
Eight SEDRIS specifications - international standards  
— published/approved 2005-2006:

- Environmental Data Coding Specification (EDCS) - *ISO / IEC 18025*
- EDCS C Binding - *ISO / IEC 18041-4*
- SEDRIS Functional Specification (DRM and API) - *ISO / IEC 18023-1*
- SEDRIS Abstract Transmittal Format - *ISO / IEC 18023-2*
- STF Binary Encoding - *ISO / IEC 18023-3*
- SEDRIS C Binding - *ISO / IEC 18024-4*
- Spatial Reference Model (SRM) - *ISO / IEC 18026*
- SRM C Binding - *ISO / IEC 18042-4*

# SEDRIS

SEDRIS provides the following:

- Common semantics
  - Common dictionary – EDCS
  - Common syntax – DRM
- Standard API
- Standard format



# SEDRIS Technology Components

## SEDRIS Data Representation Model (DRM)

*Gives the constructs to express and "shape" environmental data*

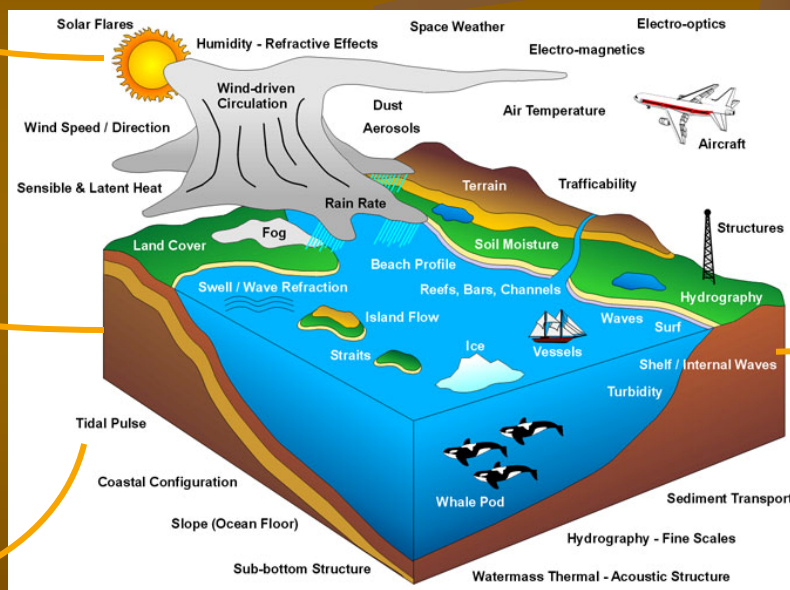
*DRM, EDCS, and SRM are used together to describe the environment*

## SEDRIS Spatial Reference Model (SRM)

*Makes the environmental description readable in other coordinates*

## SEDRIS Application Program Interface (API)

*Provides software access to individual elements of environmental data*



*API and STF are used to exchange the description of the environment*

## Environmental Data Coding Specification (EDCS)

*Names and identifies types of objects in an environmental description*

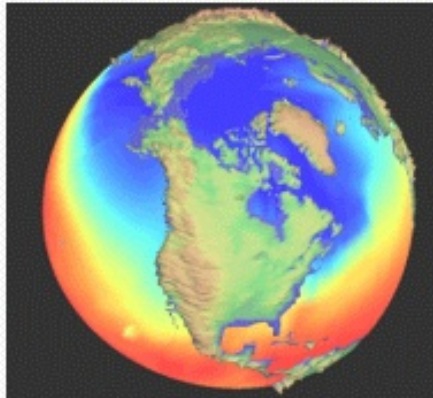
## SEDRIS Transmittal Format (STF)

*Transfer format*



# Weather Effects Data

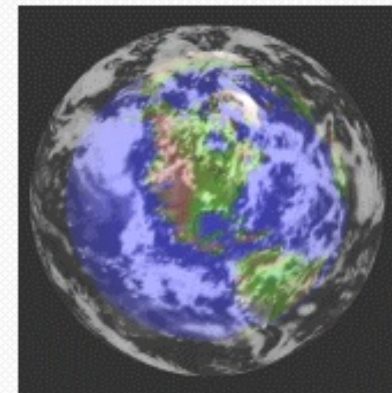
*... predicting the future environment in military planning (e.g., IMETS)*



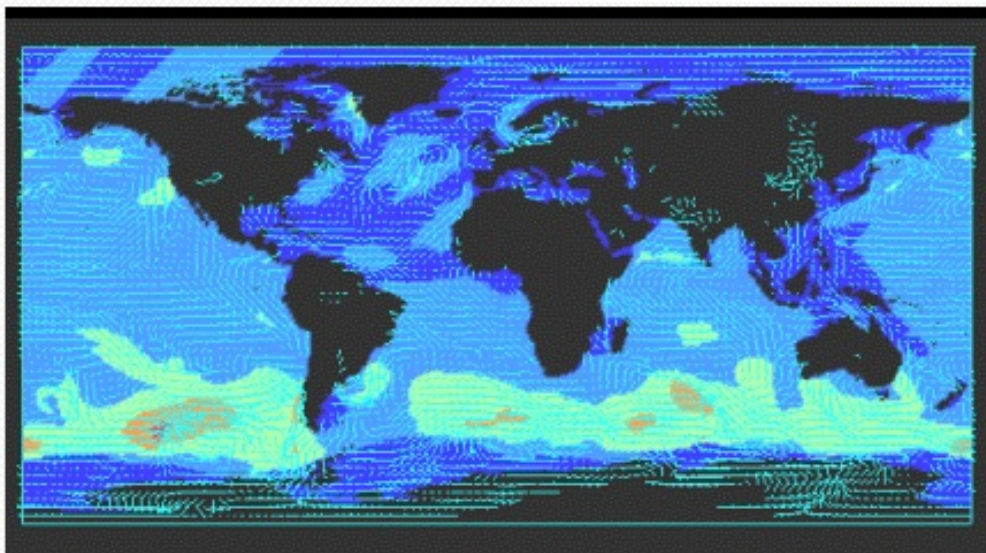
**Sea Surface Temperature**



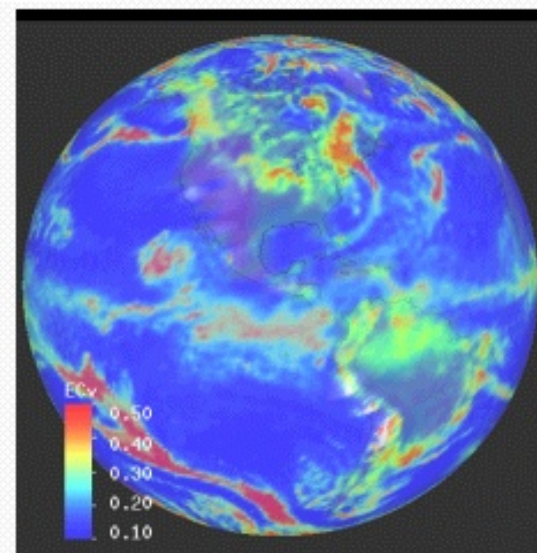
*What if it rains ...?*



**Clouds**

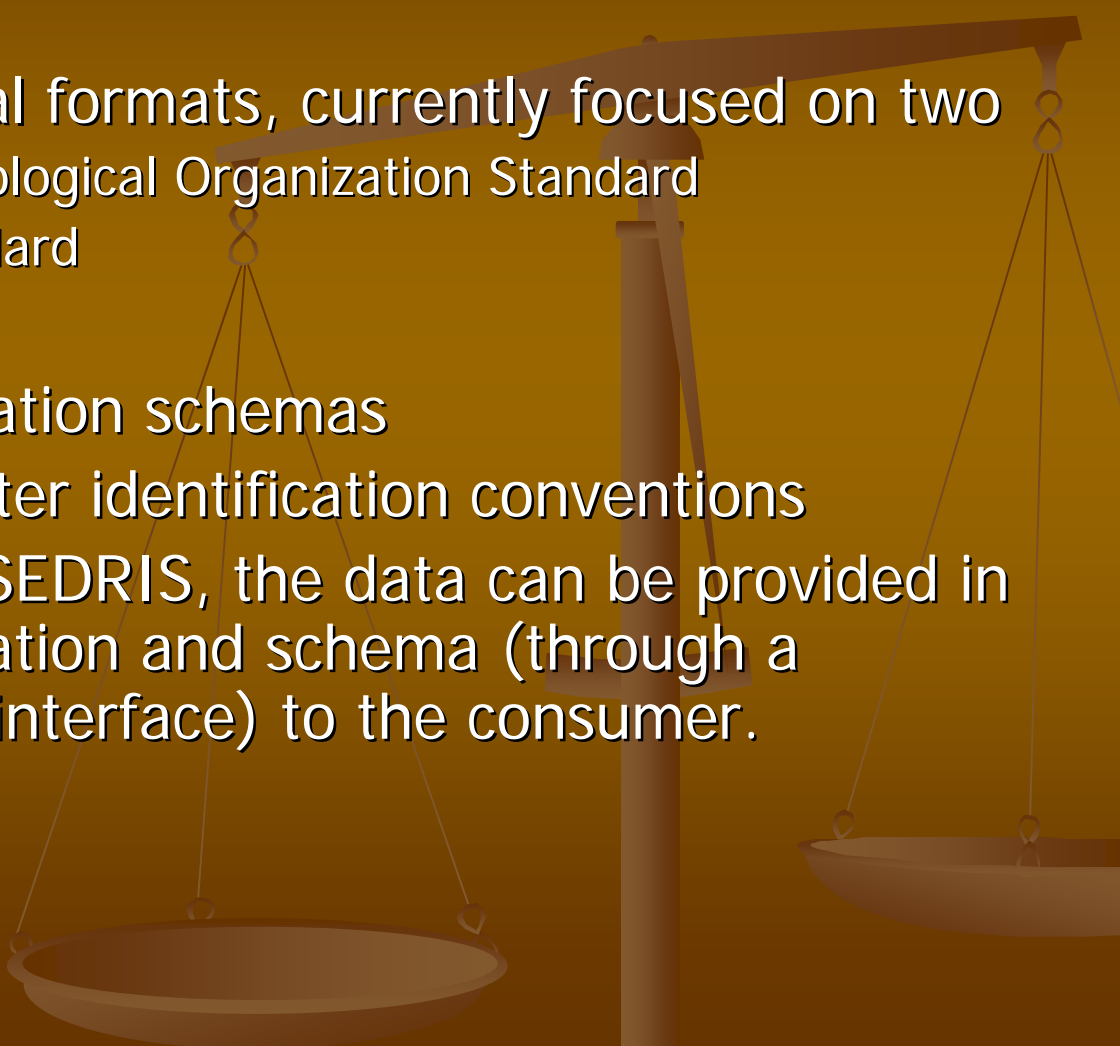


**Sea State & Surface Winds**



**Visibility**



# METOC Example

- Data can be in several formats, currently focused on two
    - GRIB – World Meteorological Organization Standard
    - METGM – NATO standard
  - Gridded data sets
  - Use different organization schemas
  - Use different parameter identification conventions
  - By mapping each to SEDRIS, the data can be provided in a common representation and schema (through a common format and interface) to the consumer.
- 

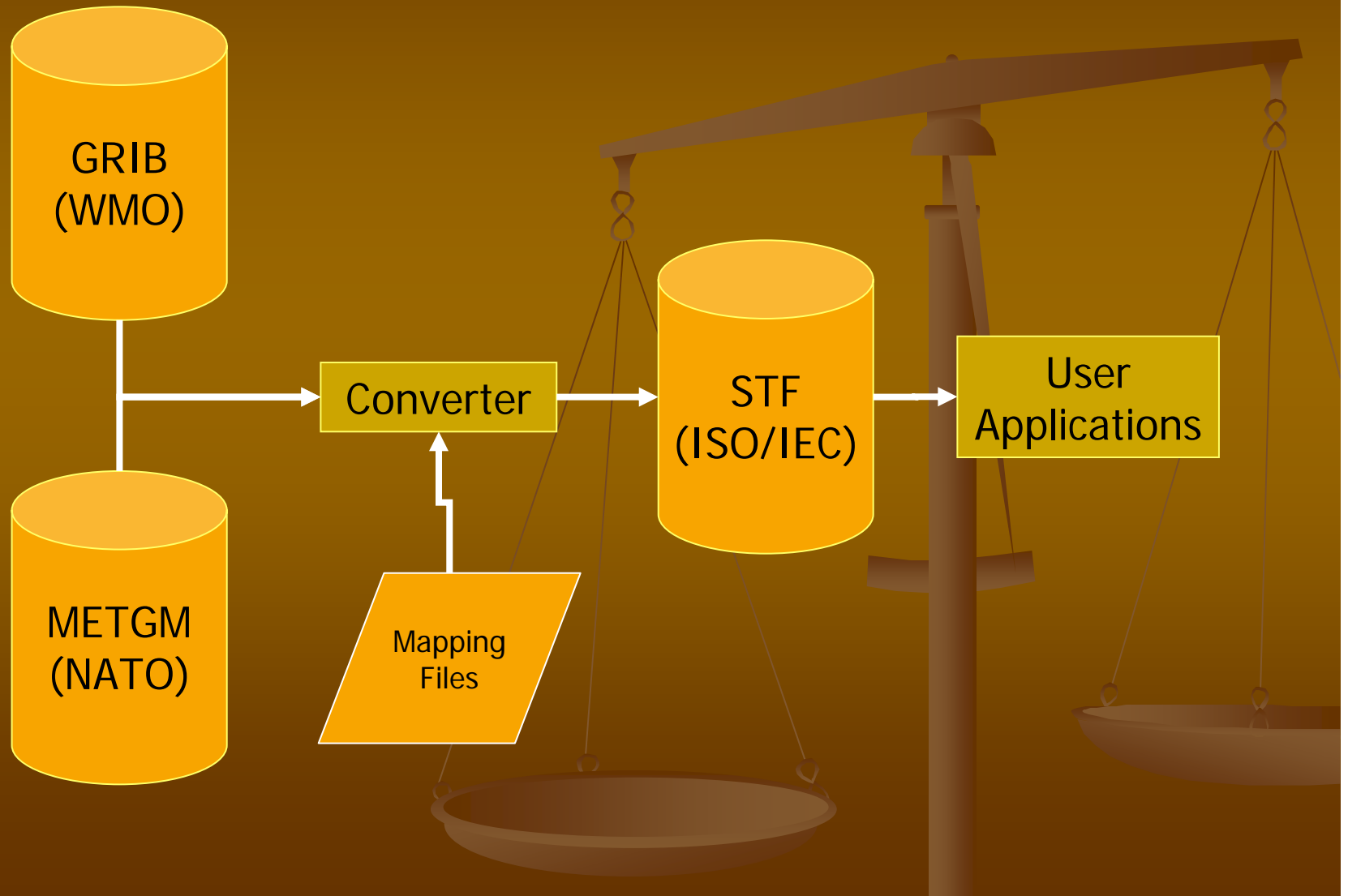
# METOC Example Parameter Mappings

EDCS EAC	Parameter Number		Additional Parameter	
	GRIB	METGM	GRIB	METGM
AIR_TEMPERATURE	11	5		
GEOPOTENTIAL_ALTITUDE	7	7		pr = 2
ATM_PRESSURE	2	7		pr = 2
WIND_SPEED_EAST	49	2	vr = 0	
WIND_SPEED_NORTH	50	3	vr = 0	
WIND_SPEED_U	49		vr = 1	
WIND_SPEED_V	50		vr = 1	

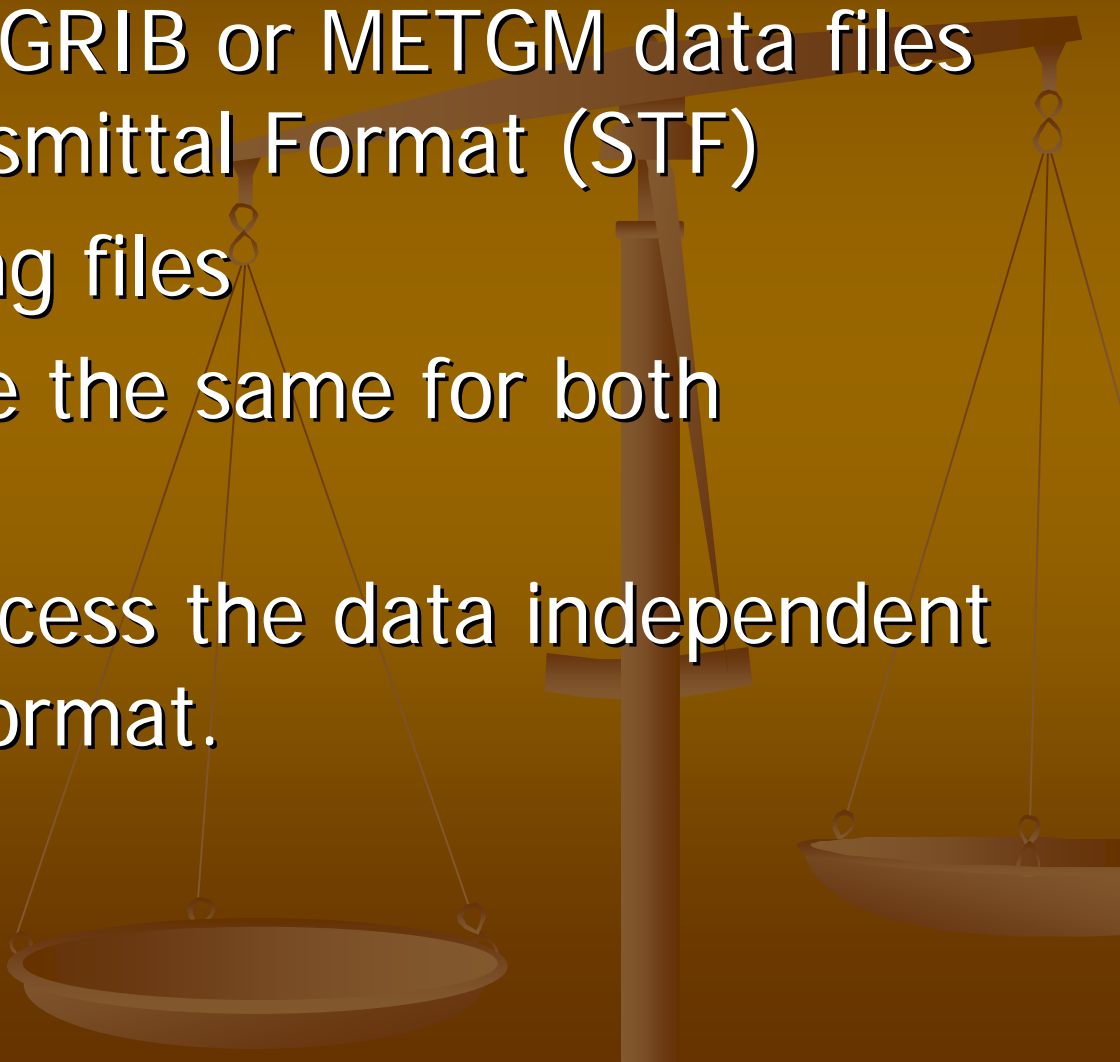
pr = reference level flag  
vr = vector resolution flag

 no equivalent parameter  
 not applicable

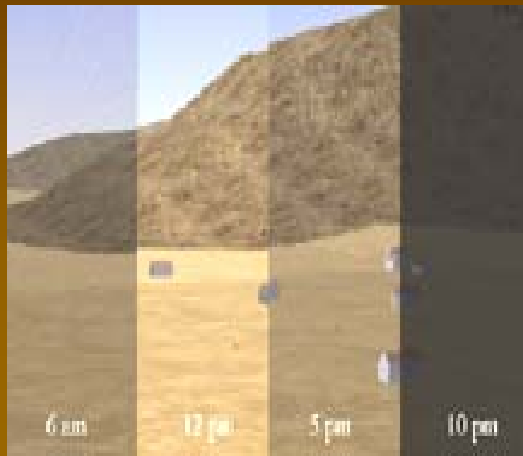
# METOC Example Data file



# METOC Example Conversion Software

- Converts either GRIB or METGM data files to SEDRIS Transmittal Format (STF)
  - External mapping files
  - Output structure the same for both formats
  - End user can access the data independent of the original format.
- 

# Atmospheric Effects Data



Time-of-Day



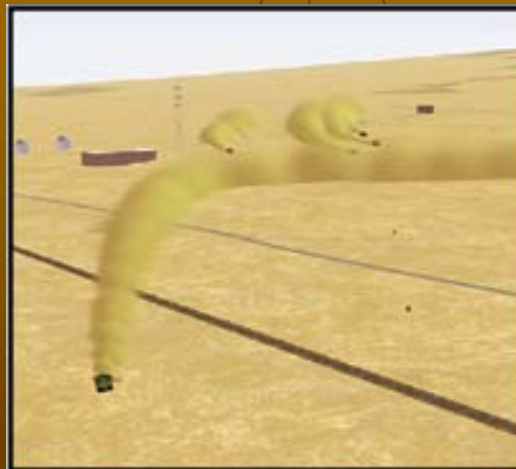
Precipitation



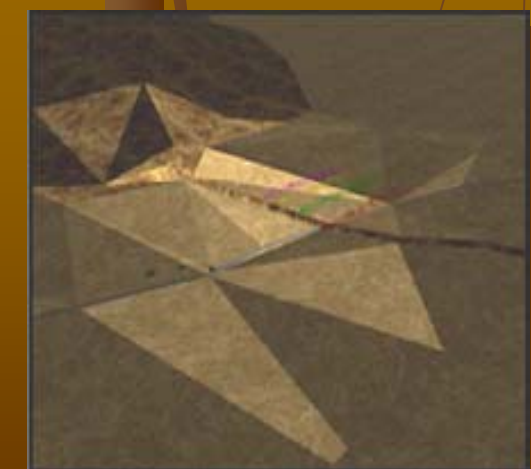
Haze



Clouds

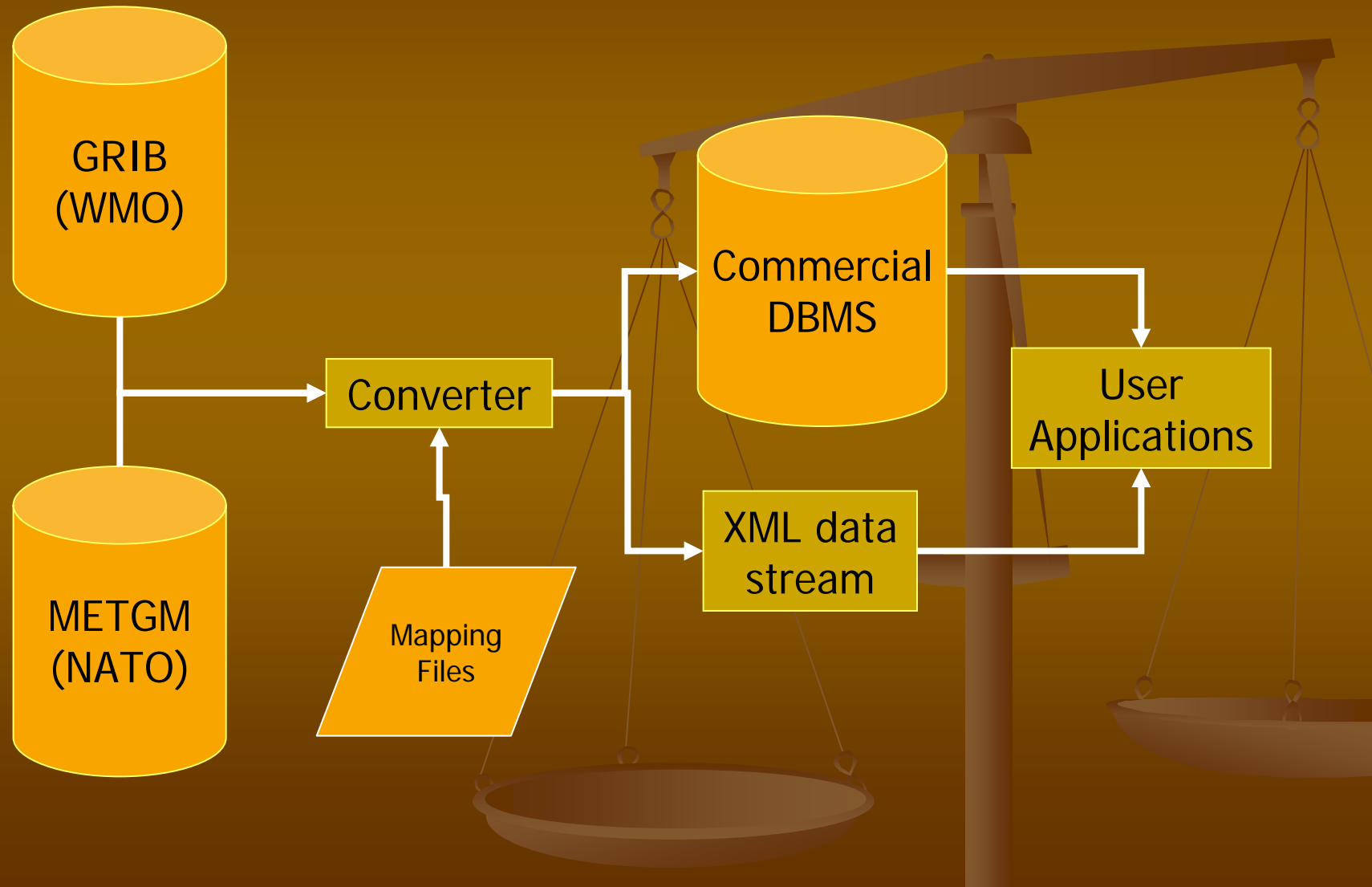


Vehicular Dust



Signal / Illumination Flares

# METOC Example DBMS & XML

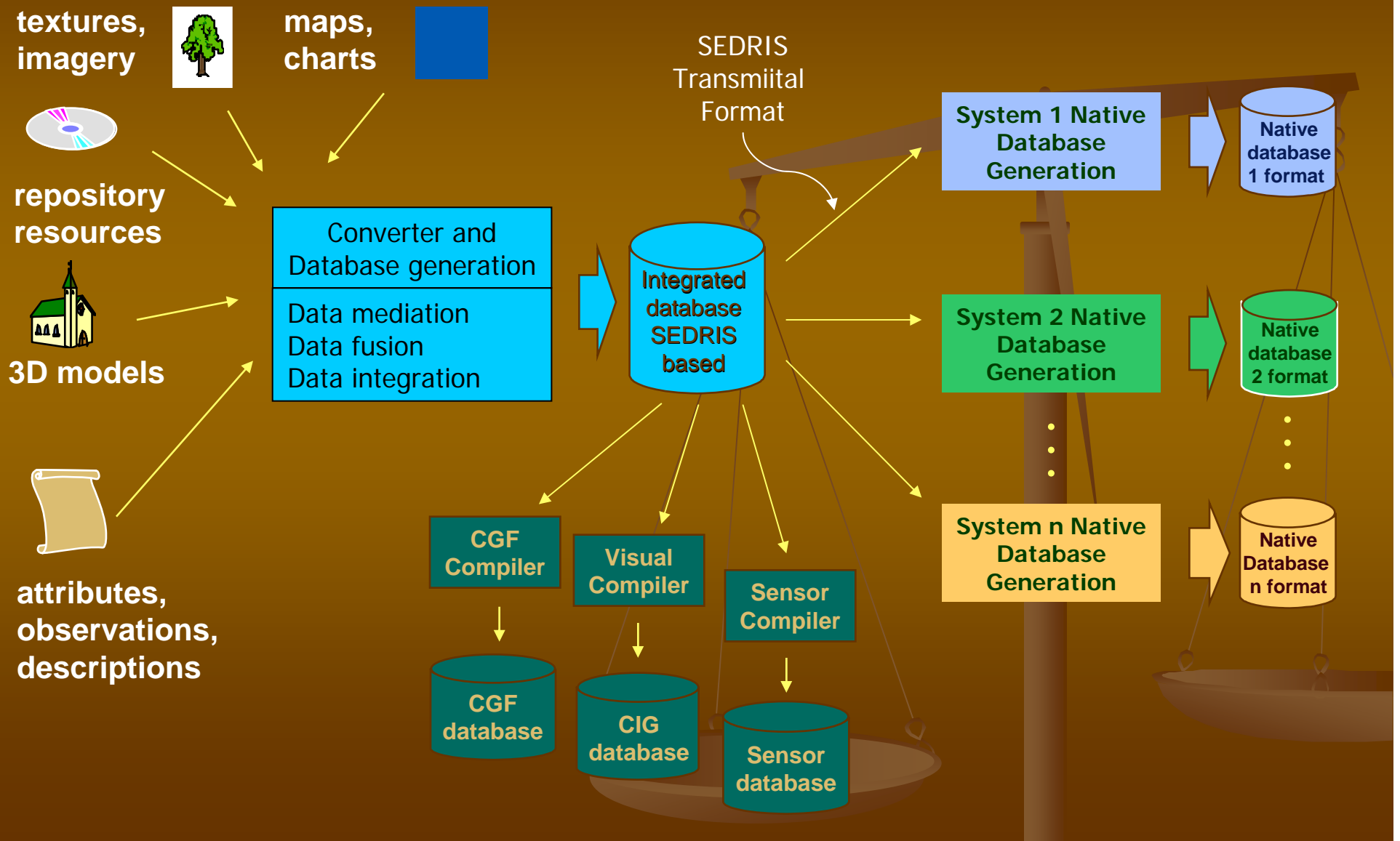


# METOC Example

- A converter could output the data to a commercial relational and/or object oriented database management system.
- The underlying representation and schema will continue to use SEDRIS standards
- This allows the use of standards-based semantics and representations in a variety of applications that currently interact with commercial DBMS systems.
- Could read data, perform mapping on the fly to:
  - Insert in to database
  - Make available to an application in standard form
  - Retransmit as XML stream
  - Etc.



# General M&S Example



# SUMMARY

- The SEDRIS suite of ISO/IEC standards provide standard tools for data mediation.
    - Data dictionary – EDCS
    - Semantics - DRM
    - Interface and format
  - Not limited to a single environmental domain.
- 