



Data Requirements

Content & Interface Specification - TCRS

<http://www.sedris.org/>

SEDRIIS™ Technology Conference
Lake Buena Vista, FL
08 January 2004

Gregory Hull
SAIC
greg.a.hull@saic.com



Agenda

Problem Background and Scope

Problem Statement

TCRS Concept

Types of TCRS requirements

TCRS Components

- TCRS language syntax and encoding
- TCRS parsing and checker application

Future applications leveraging TCRS components

Summary / Conclusion



Problem Background and Scope

SEDRIIS technologies (DRM, EDCS, SRM) can clearly and unambiguously represent, environmental data for interchange.

Environmental data can be diverse.

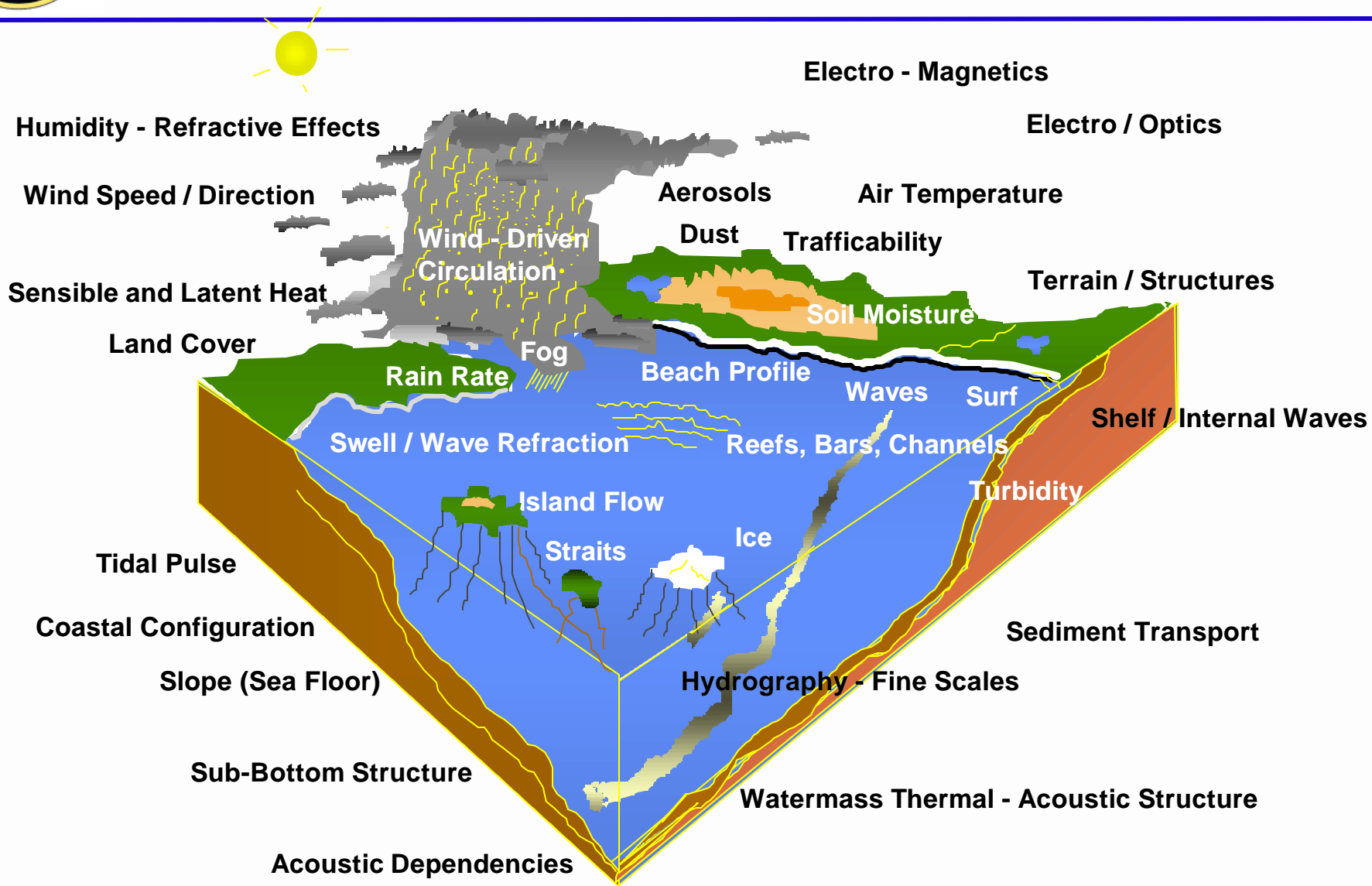
- SEDRIIS allow s us to represent everything from ocean and weather data to space and Martian terrain data

In addition, environmental data may be represented in multiple ways. For example:

- A tree view ed as an obstacle may be represented as a simple point feature w ith minimal attribution.
- A tree may also be view ed as an entire ecosystem and so may require many DRM objects and much attribution to represent.



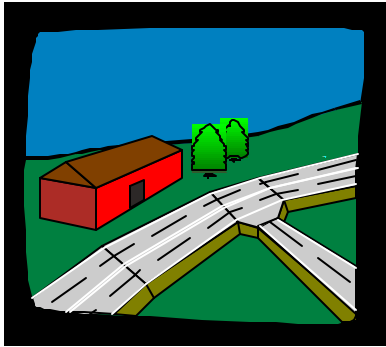
Problem Statement: Diverse Environmental Data



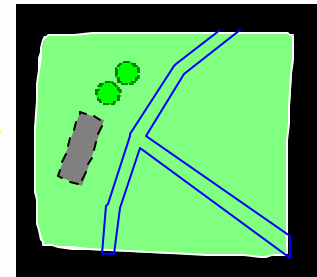


Problem Statement: Different Views of the Environment

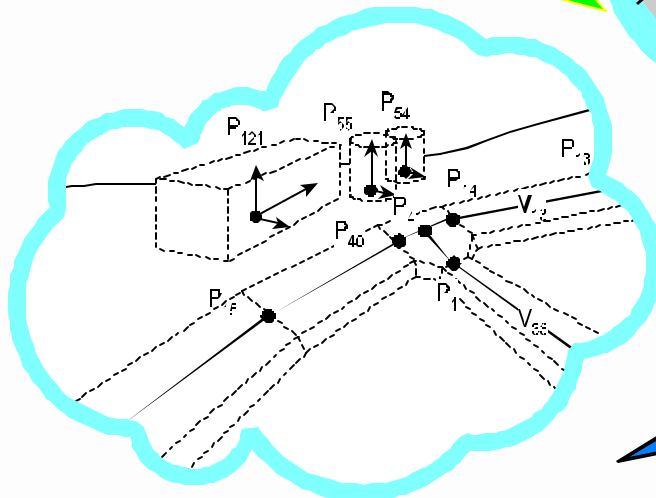
Visual Database



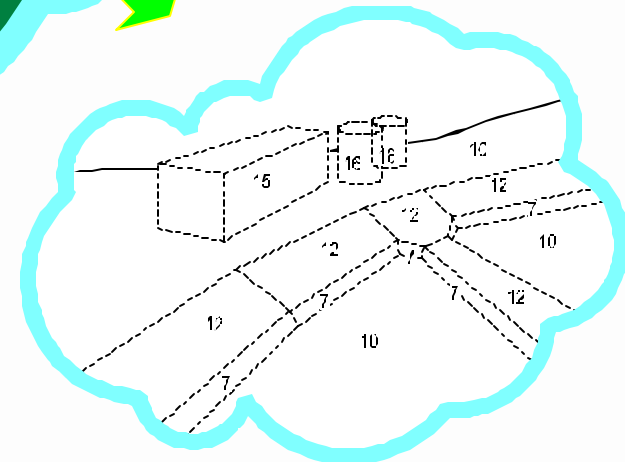
Electronic Maps



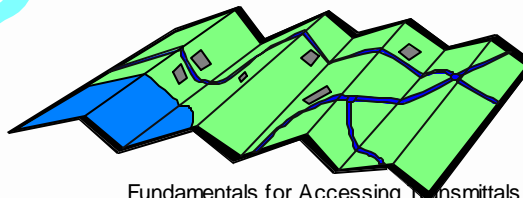
Mobility Database



CGF Database



Paper Maps





The Problem Statement

While SEDRIIS is good at representing data we can't use the same technologies to **define the requirements** for the data we can represent with it.

- The DRM, EDCS, SRM doesn't allow users to specify whether or not the content of a transmittal meets a user's expectations, whether it is fit for the use of a given application.

Without this it can be problematic to consume SEDRIIS data due to differences in the expectations of the data content.



TCRS Solution

Consumers limit the kinds of data that they will handle by specifying requirements for their transmittals. The requirements may pertain to:

- The semantic content
- The representational form (organizational structure and representational mechanisms)

This has been done in word form by many programs for some time now.

A TCRS as a Word document has 2 drawbacks:

- Natural language requirements have a tendency to not be precise.
- There is no way to automatically check whether a Transmittal conforms to the TCRS.



TCRS Solution

A TCRS formal language syntax has been developed to express the requirements for a consumption program's Transmittals.

- Syntax is encoded utilizing XML with an accompanying document type definition (DTD).

This TCRS syntax may also be used by a SEDRIS production application to define requirements that are satisfied by all Transmittals created by the application.

TCRS can also be used to define requirements at input or output of systems/applications.



TCRS Solution

The TCRS provides a mechanism for acceptance of transmittals between producers and consumers.

A consumption-based TCRS may be distributed to potential data providers to ensure that their transmittals will be suitable for the consumption application.

Likewise a production-based TCRS may be distributed with the transmittals to aid consumers in traversing the transmittals.



TCRS Solution

The ability to define requirements provides the power to evaluate and then process data that claim compliance to this set of requirements.

The application that does this is the TCRS_Checker. It will:

- parse the XML document
- evaluate a transmittal against a TCRS
- Provide feedback on what caused any failed requirements
- Is currently in Beta Testing. Volunteers?

Having a verifiable TCRS simplifies the design of consumption code by letting the code assume that the transmittal contains the required information in the required form.



TCRS Requirements

Common types of TCRS requirements :

Specify which EDCS classification codes must be present.

Define which EDCS attribution is needed for given classification codes.

Define what SRF(s) the location data is expected to be in.

Specify what organization or structure of the transmittal hierarchy is used. (ex. Spatial Index Related Geometry followed by Classification Related Geometry.)

Define which DRM classes are used to represent the 'things' in a transmittal (ex. Roads are represented as a Linear Feature with a Classification Data of ECC_ROAD.)

Specify that a certain number of 'things' must exist in a transmittal. (eg. Can impose a maximum limit on the number of 'things'.)

Specify that given DRM classes may not exist in a transmittal.



Future development efforts

Tools, utilities and applications that can be used to 'transform' transmittals with the necessary information into a valid form that satisfies a given TCRS.

Use the TCRS-developed components for object matching into powerful searching tools. These may be used for transmittal analysis and also for general consumption code.



Summary and Conclusions

TCRS provides a mechanism (syntax and application) to validate a transmittal against a formal set of user requirements.

The TCRS provides a mechanism for acceptance of transmittals between producers and consumers.

Using the TCRS technology will open the door so applications can process and transform data in an automated (or semi-automated) manner, given an input and output TCRS document



Where to go from here

“How to Produce and Consume” tutorial

- Concrete example of TCRS
- Methodology and process of TCRS

Become a beta tester

- TCRS_Checker application
- Review encoding