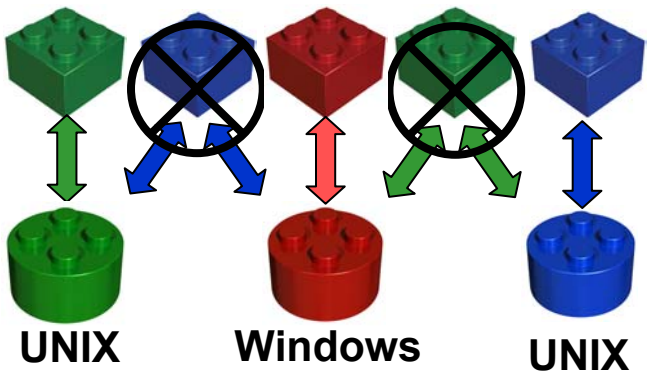
OpenSpirit "Carto" Service

The Next Generation

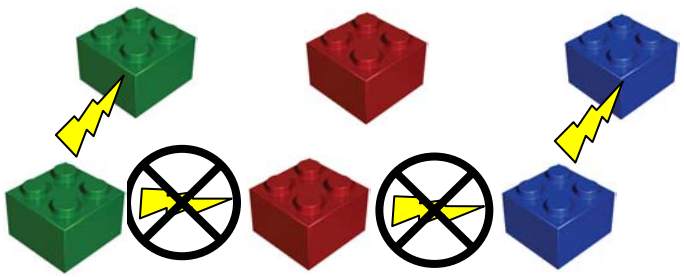
OpenSpirit
THE INTEGRATION COMPANY

Integration Problems



Applications can't readily access data

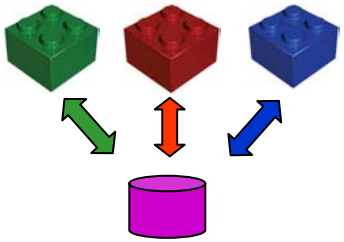
- Inconsistent, limited, or missing project catalogs
- Inconsistent formats
- Mixed platforms
- Wrong/unknown units and coordinates
- Allowable values differ



Applications don't interoperate

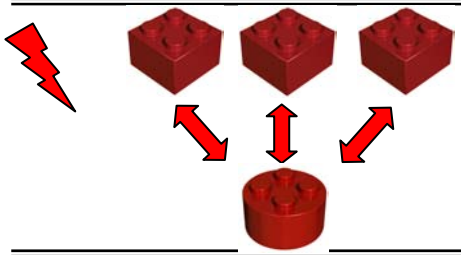
- No sharing of user interaction events
- No sharing of data change events
- Inconsistent user interface conventions
- No shared displays

Approaches to Integration

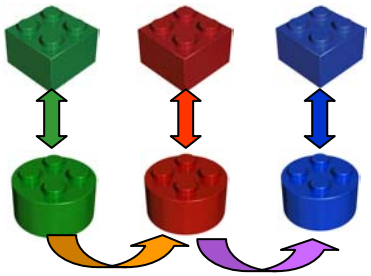


One unified "standard" database

- POSC
- PPDM

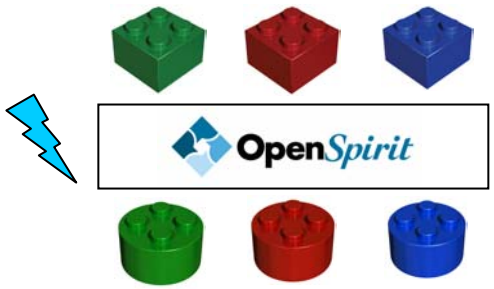


Buy applications from a single vendor



Transfer data

- Geoshare - OpenSpirit
- other CopySync



Use common middleware

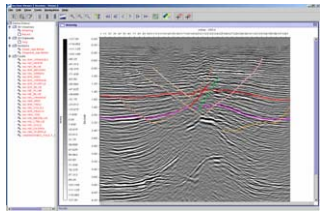
- OpenSpirit

OpenSpirit Integration

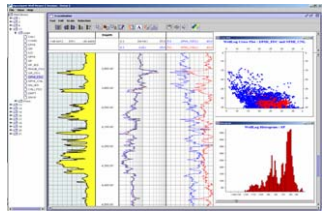
Connect Your Applications

Plus applications from 24+ other vendors

View data from any project anywhere in your network

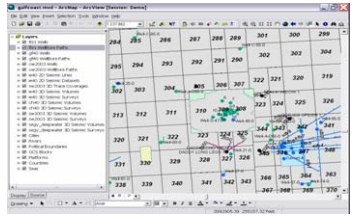


Section Viewer



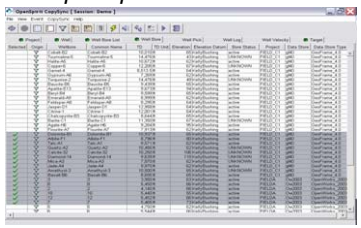
Well Viewer

Make your G&G data available through your GIS tools

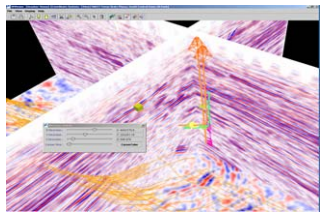


ArcView Extension

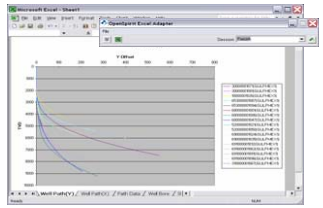
One-step data transfer between any OpenSpirit enabled datstore



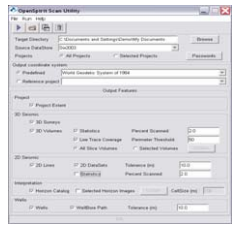
CopySync



3D Viewer



Excel Adapter



Scan Utility

user interaction

data access

OpenSpirit Integration Framework

user interaction

data access

Connect Your Databases

SEGY | Gocad | Kingdom* | Finder | OpenWorks | GeoFrame | Other…

* = in development

OpenSpirit

What OpenSpirit is NOT

- An end-user G & G application
  - We do provide viewers for demonstration or installation QC purposes.
- A database
  - We help you write applications which feed on multiple databases implemented by other vendors and integrate with other applications from these vendors.
- A GIS
  - We must integrate location information from multiple sources.
  - We write the "glue" to tie 3rd party implementations into our framework, much like the data providers.

OpenSpirit Enabled Applications Currently Available

Application Vendor	Application
A2D	**Silverwire Adaptor** *
Earth Decision Sciences	**Gocad**
ESRI *(OpenSpirit ArcView Exension)*	**ArcView**
Hampson-Russell (Veritas)	**eLog**
	Emerge
	ISMap
	PRO4D
	Strata
Knowledge Systems Inc.	**Predict**
Microsoft *(OpenSpirit Excel Adaptor)*	**Excel**
Nutec Energy Services	**Prima**
Norsar	**Seismic Modeling**
OpenSpirit Corporation	**3D Viewer**
	DataSelector
	Scan Utility
	Section Viewer
	TabSelector

Application Vendor	Application
Peleton	**Wellview** *
Prime Geoscience	**PrimeView**
Seismic Micro-Technology	**Kingdom**
SIS, GeoQuest	**Charisma**
	Flogrid
	GeoViz
	IESX
	Inside Reality
	MathCube
	PowerPlan
	SimCube
	VarianceCube
SIS, Merak (OpenSpirit Adaptor)	**Peep**
SIS, Petrel	**Petrel**
VoxelVision	**GigaViz**
	TerraStudio

* - prototype

Framework Components

Services

- Attribute Query
- Copy
- Reference Value
- Units
- Coordinate
- Data Store Descriptor
- User Alias
- Notification (events)

Interaction Events

- Object Selection
- Data Selection
- Data Change
- Area of Interest (AOI)
- Point of Interest (POI)
- Cursor Location
- GIS Feature Selection

Business Objects

- Project
- Projectset
- Wellbore List
- Well
- Wellbore
- Well Log
- Well Pick
- Well Velocity
- Drilling Target
- Earth Model
- Horizon and Horizon Properties
- Fault
- 2D Seismic Line and Dataset
- 3D Seismic Survey and Dataset

Subsurface Data Module

- *Stratigraphic Grid*

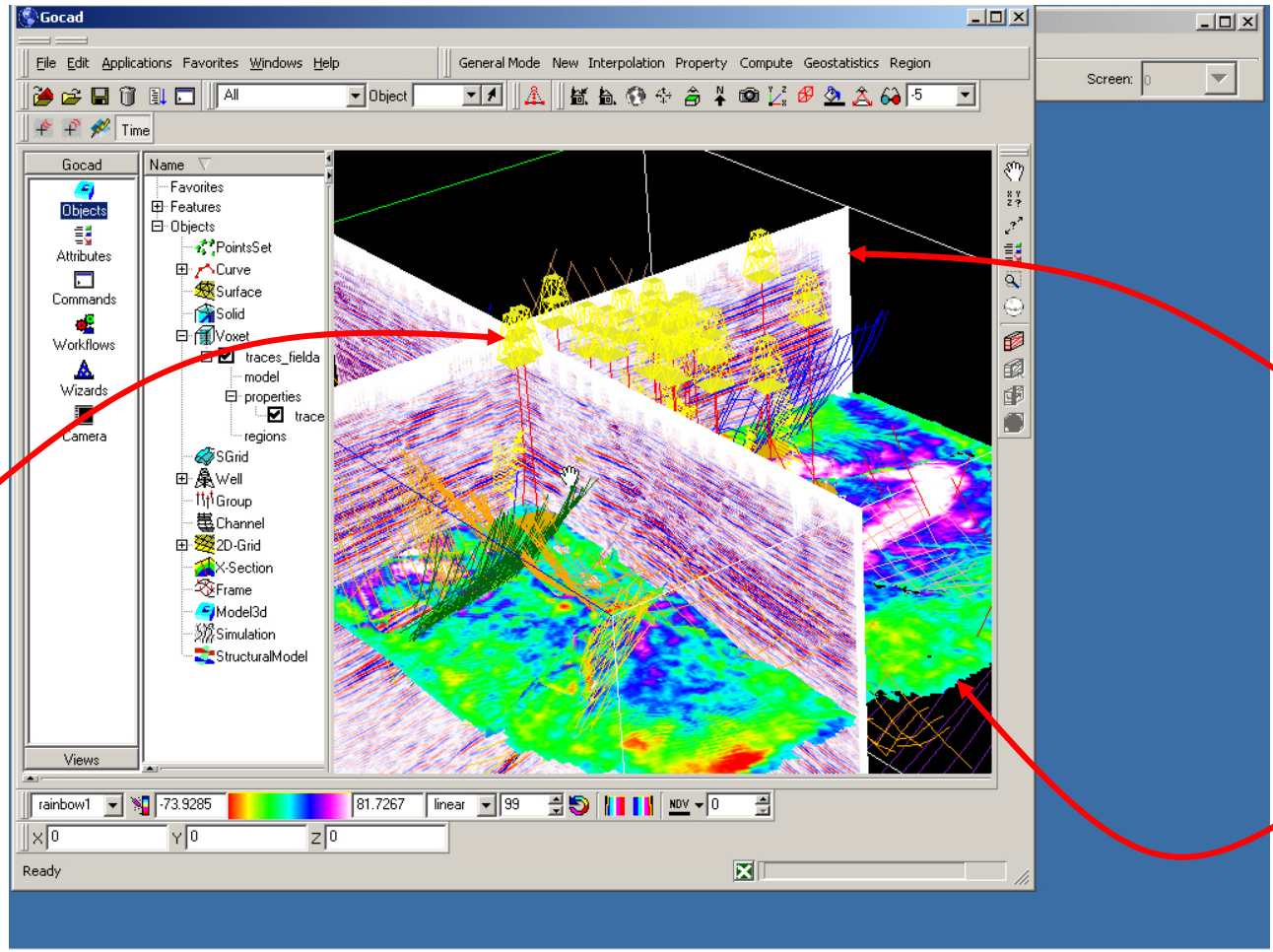
- *Platform/Bay/Slot*
- *Trajectory & Trajectory Stations*
- *Drill String & BHA Components*
- *Casing/Liner*

Drilling Data Module

in development

OpenSpirit

Problem: Multiple Sources

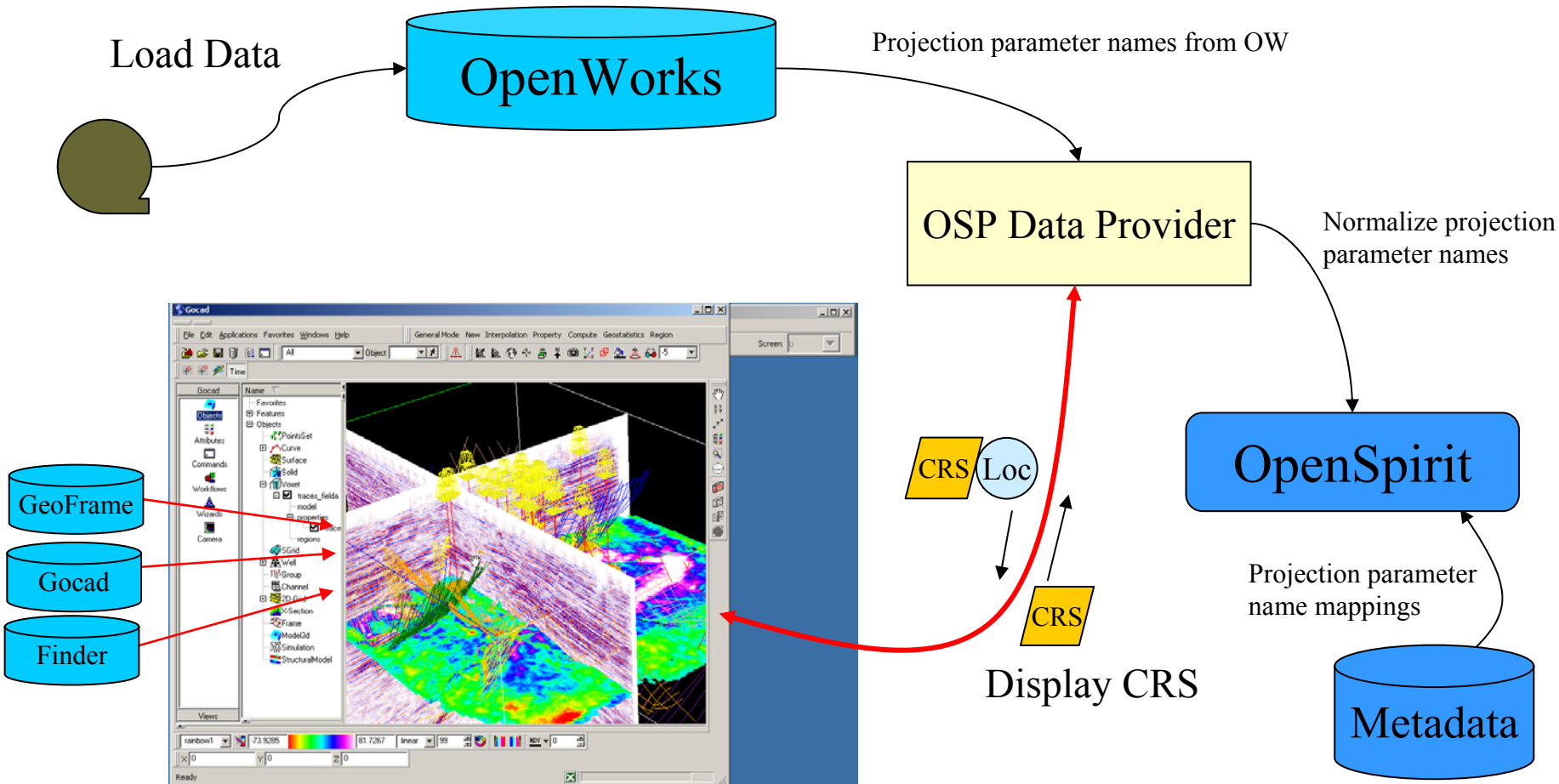


OpenWorks

SEGY

GeoFrame

Problem: Normalize Specifications



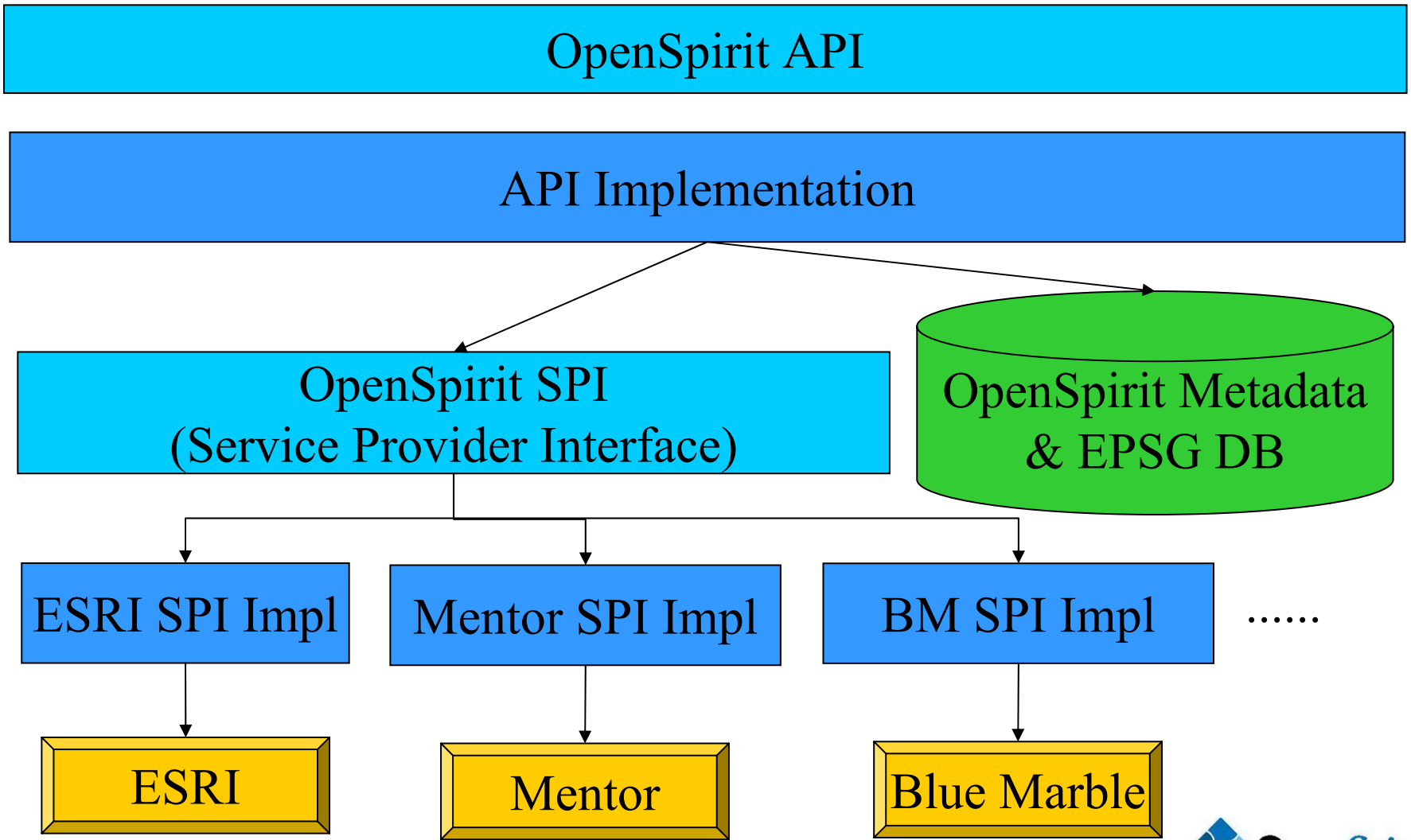
Problem: Broad platform req's

- Languages:
  - Java
  - C#
  - C++
- Operating Systems
  - Windows
  - UNIX
- Difficulties and solutions not discussed here

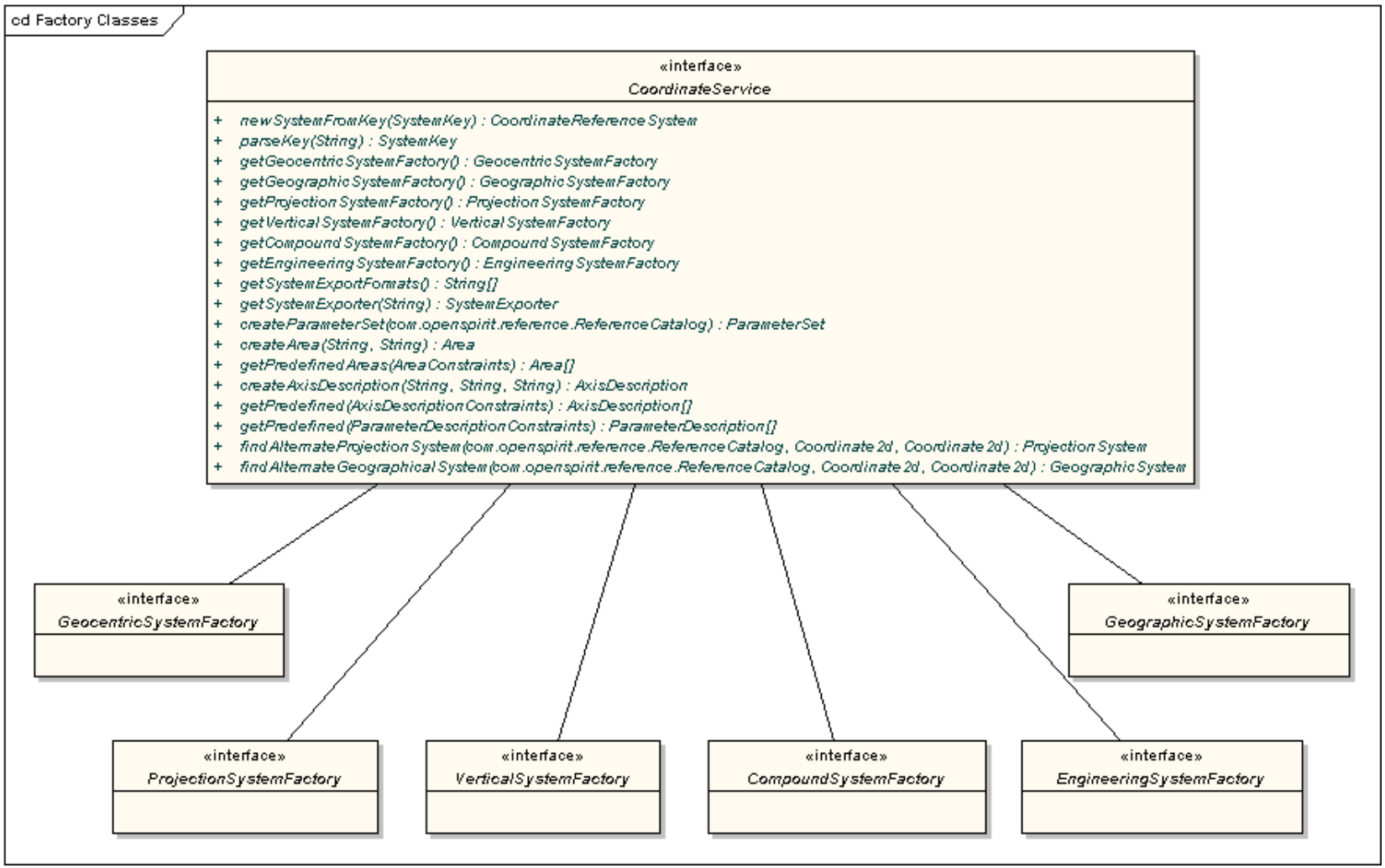
Primary Functions of Carto

- "Tag" all locations with a CRS
  - Done by "data providers", which are written by developers unfamiliar with geodesy
- Transform between CRS's when necessary
  - End-users are mostly unfamiliar with geodesy
- Express CRS in various ways for save/restore and exchange with other software
- Support custom system creation
  - I.e., support dialogs such as currently in OpenWorks and GeoFrame applications.

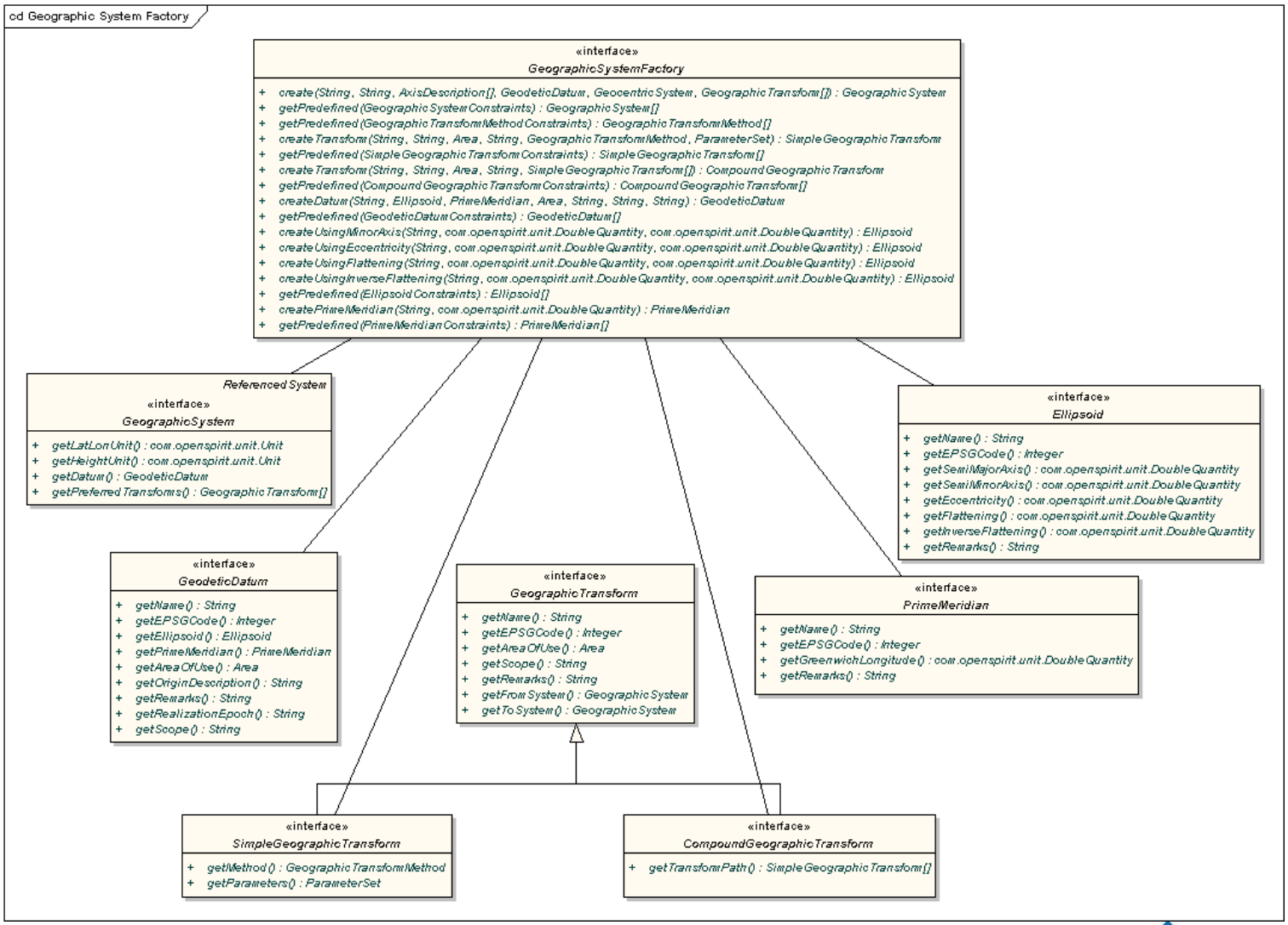
Implementation



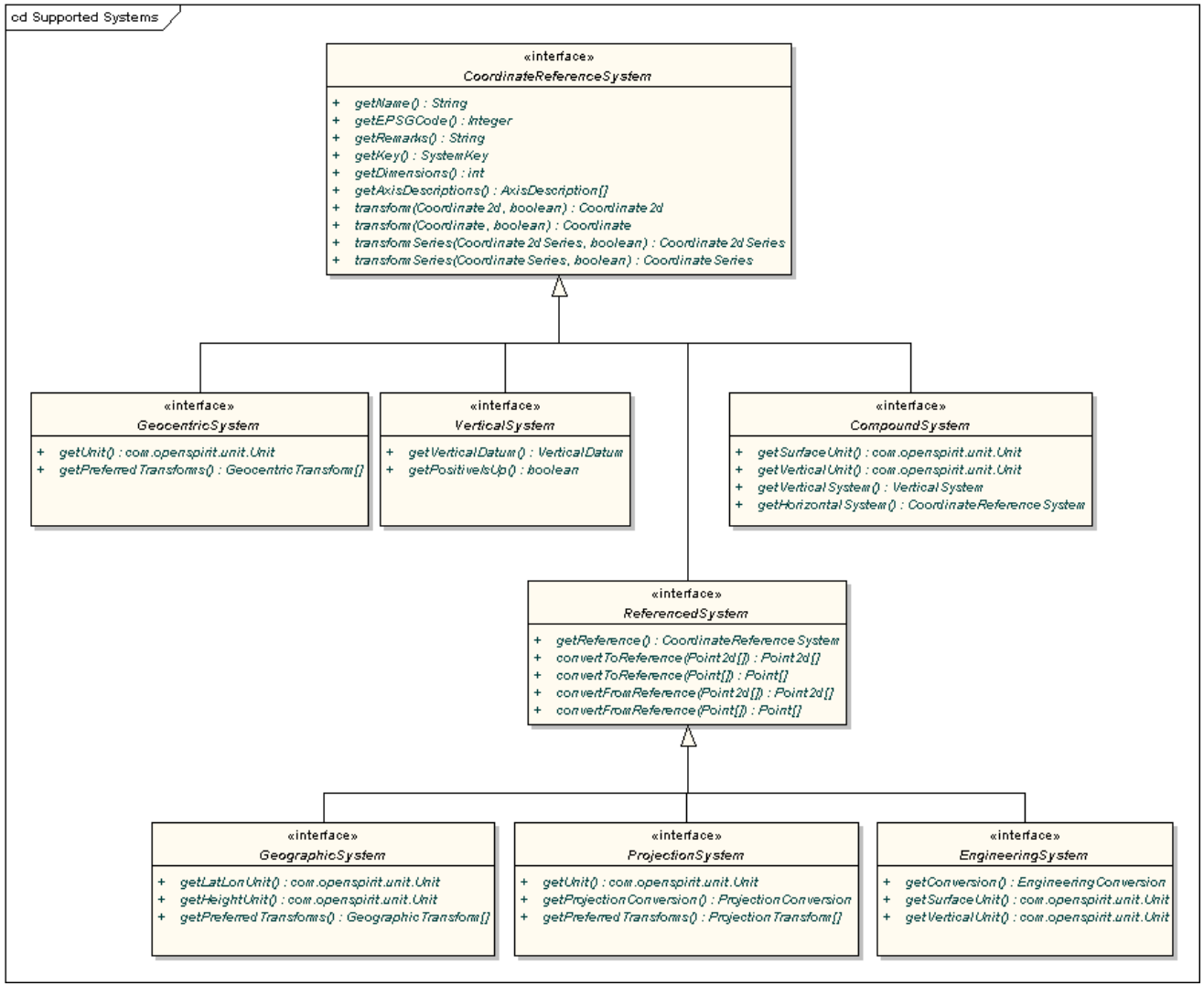
Carto Service Factories



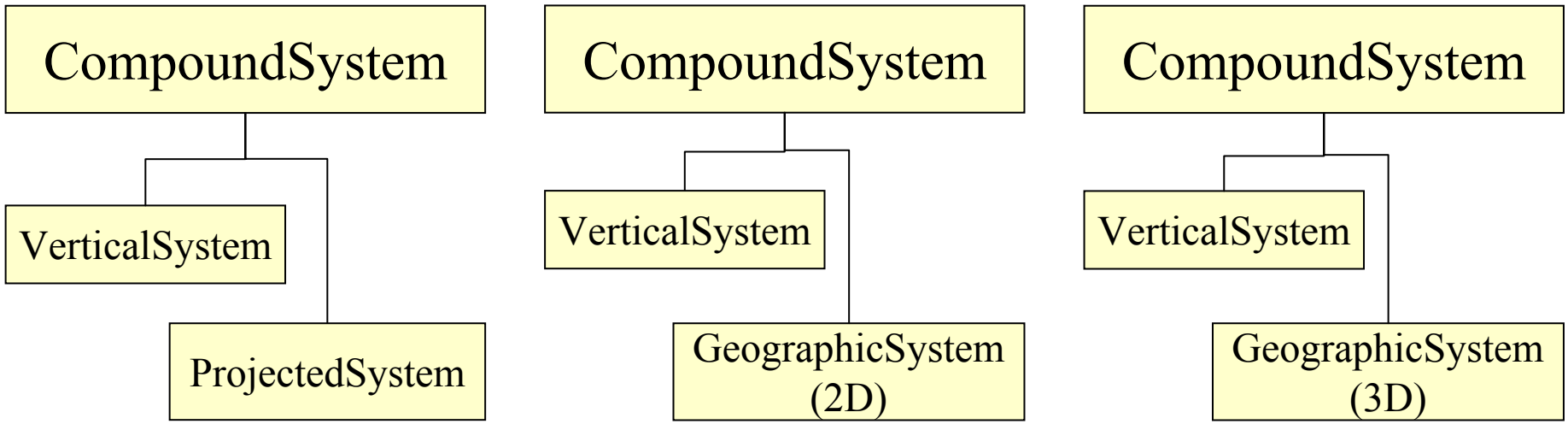
Geographic System Factory



Supported System Types



Compound Systems

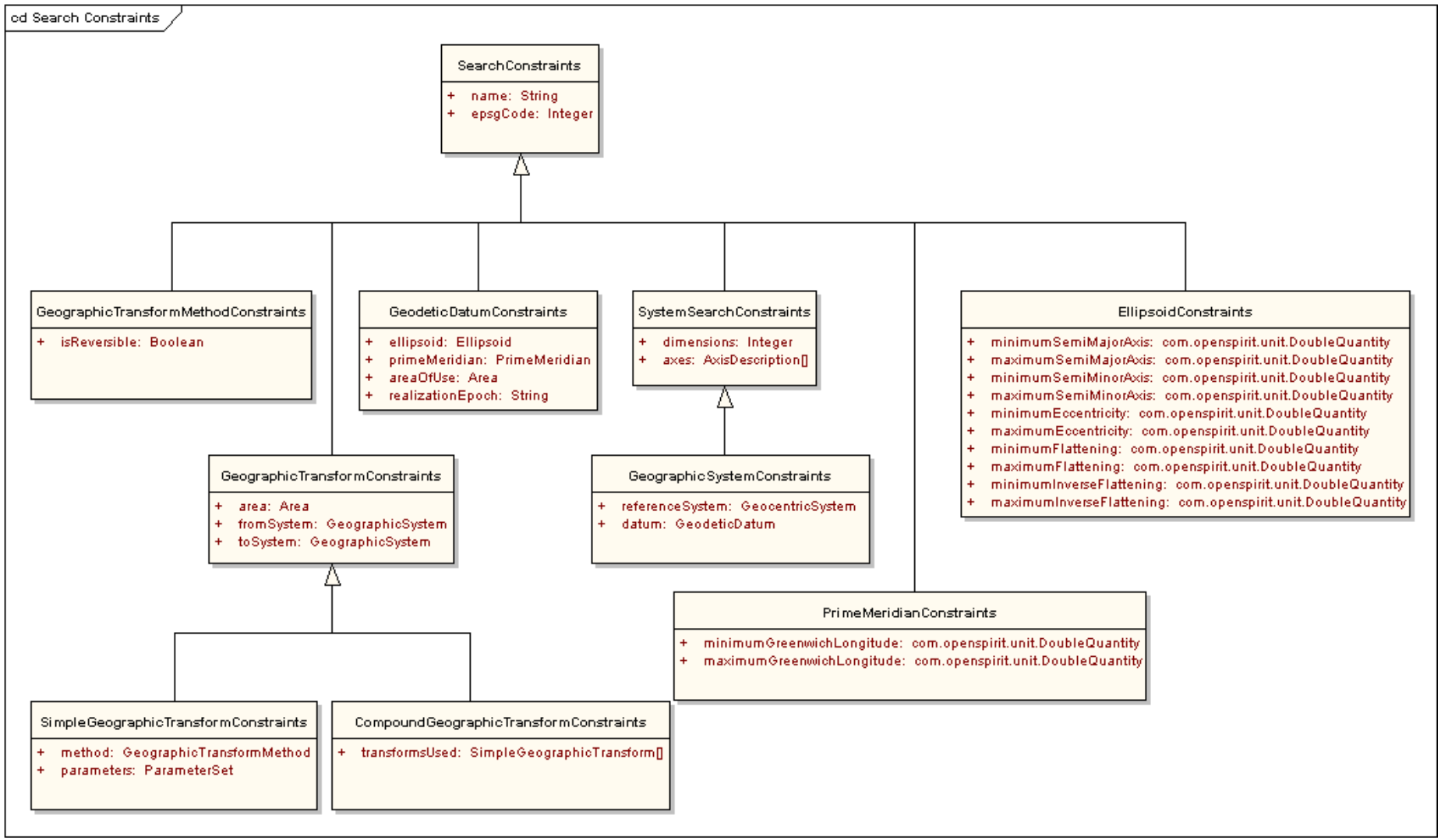


VerticalSystem defines vertical axis

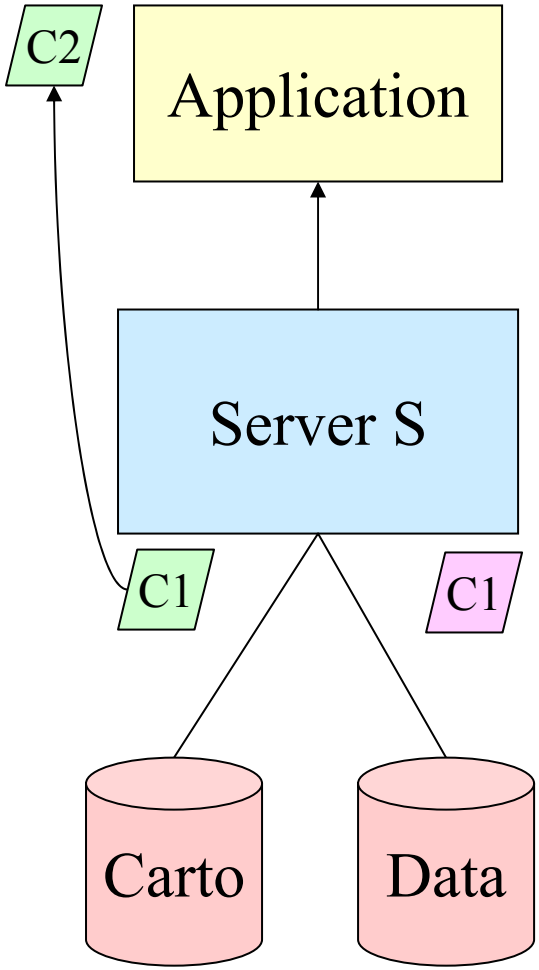
VerticalSystem defines vertical axis

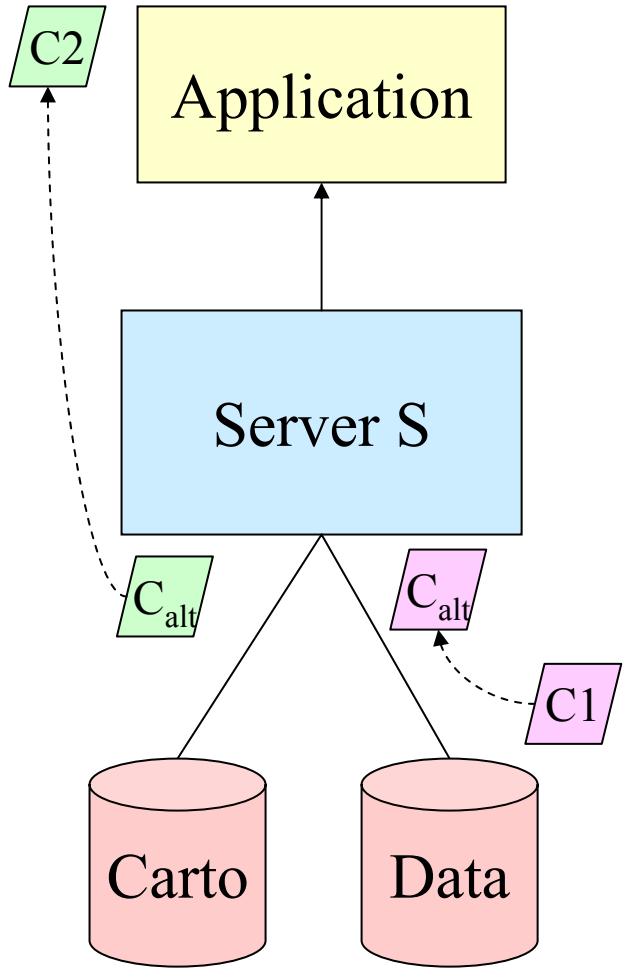
VerticalSystem defines offset from zero defined by GeographicSystem.

Finding Predefined Elements

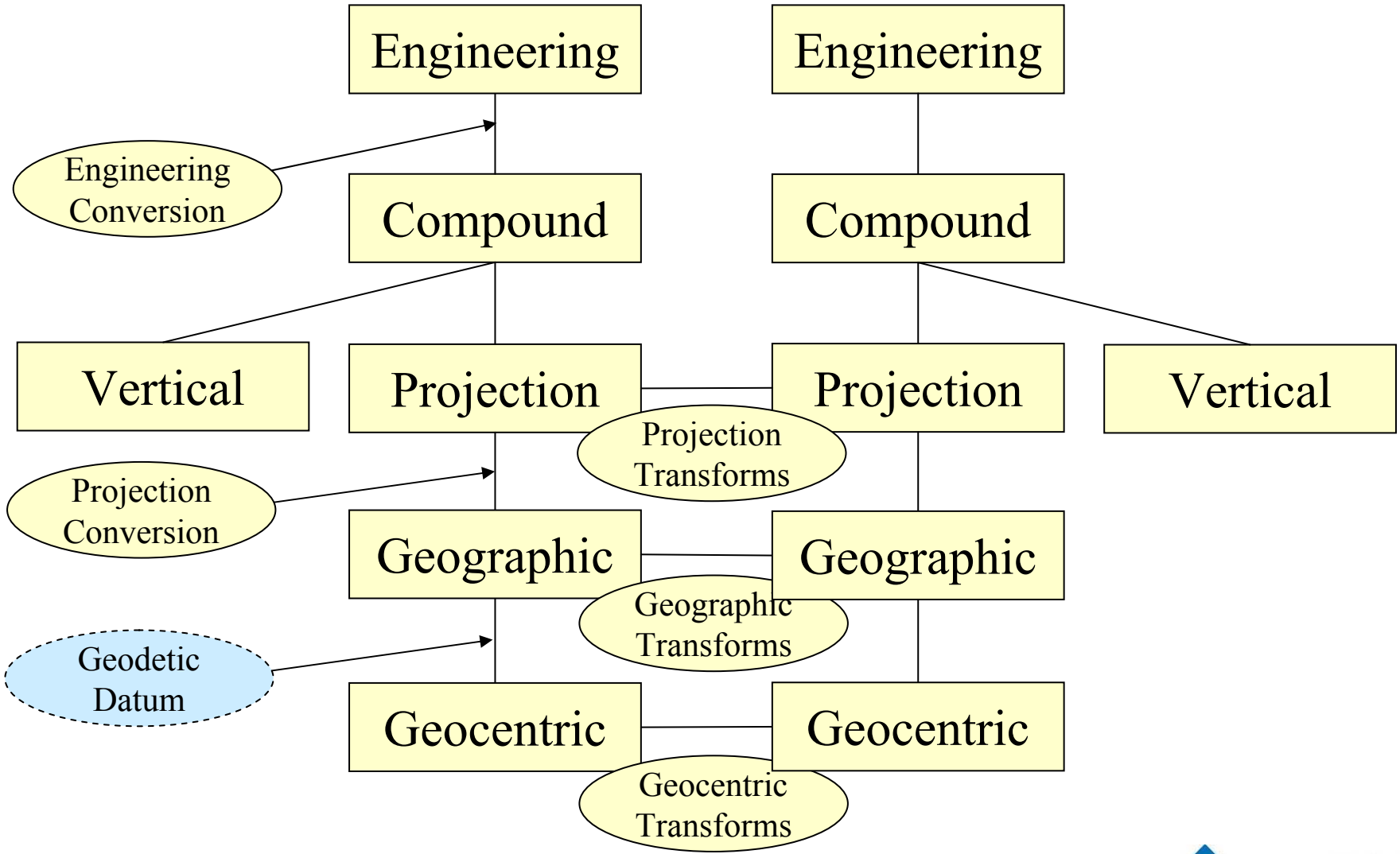


Alternate Systems

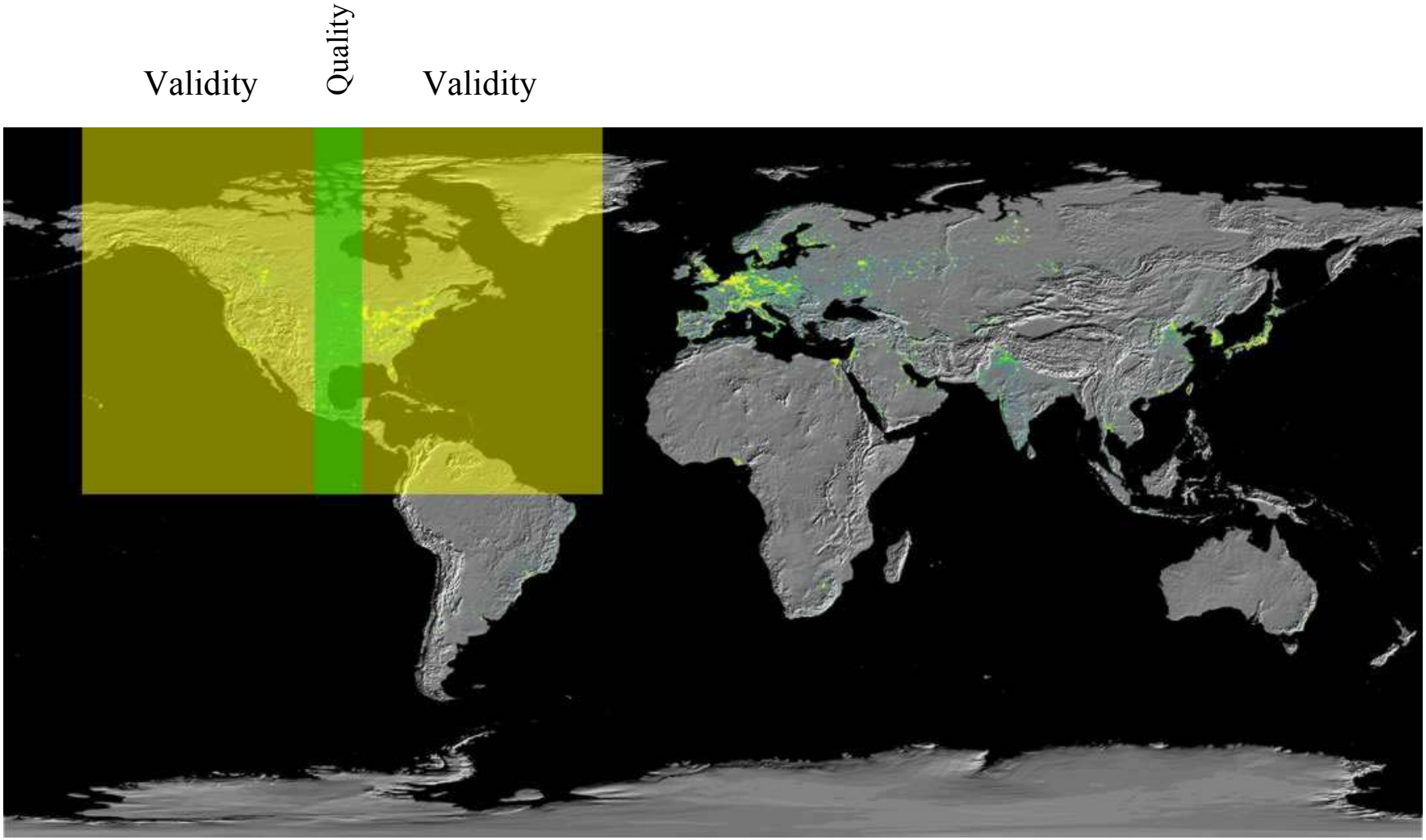




Systems, Conversions, Transforms



Quality & Validity Boxes



Normalizing Datum "Binding"

"Early binding" of
datum & transform (to WGS84)

Load Data

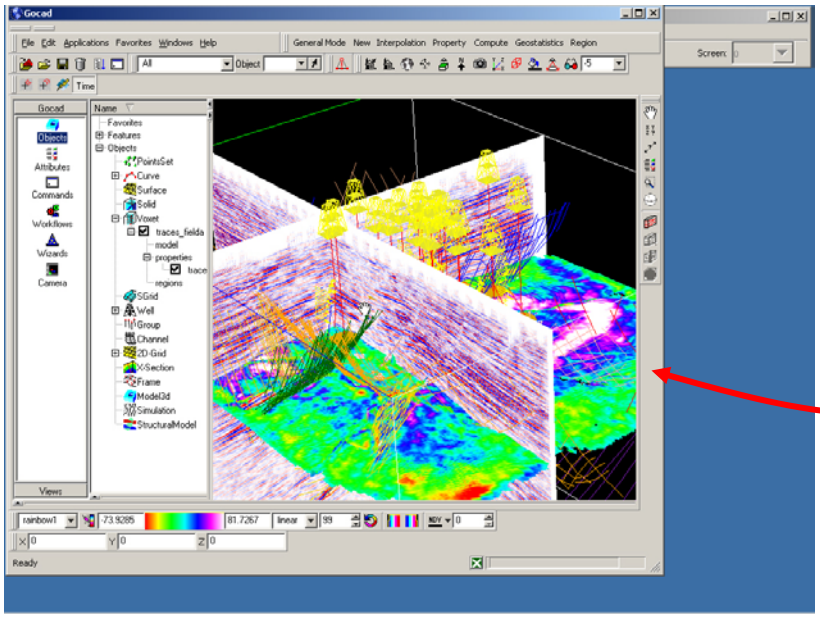
OpenWorks

Capture CRS definition in OSP terms,
including "early binding" info

From	To
ED50	WGS84

OSP Data Provider

Transform



CRS Loc

OpenSpirit

Separate datum
& transform

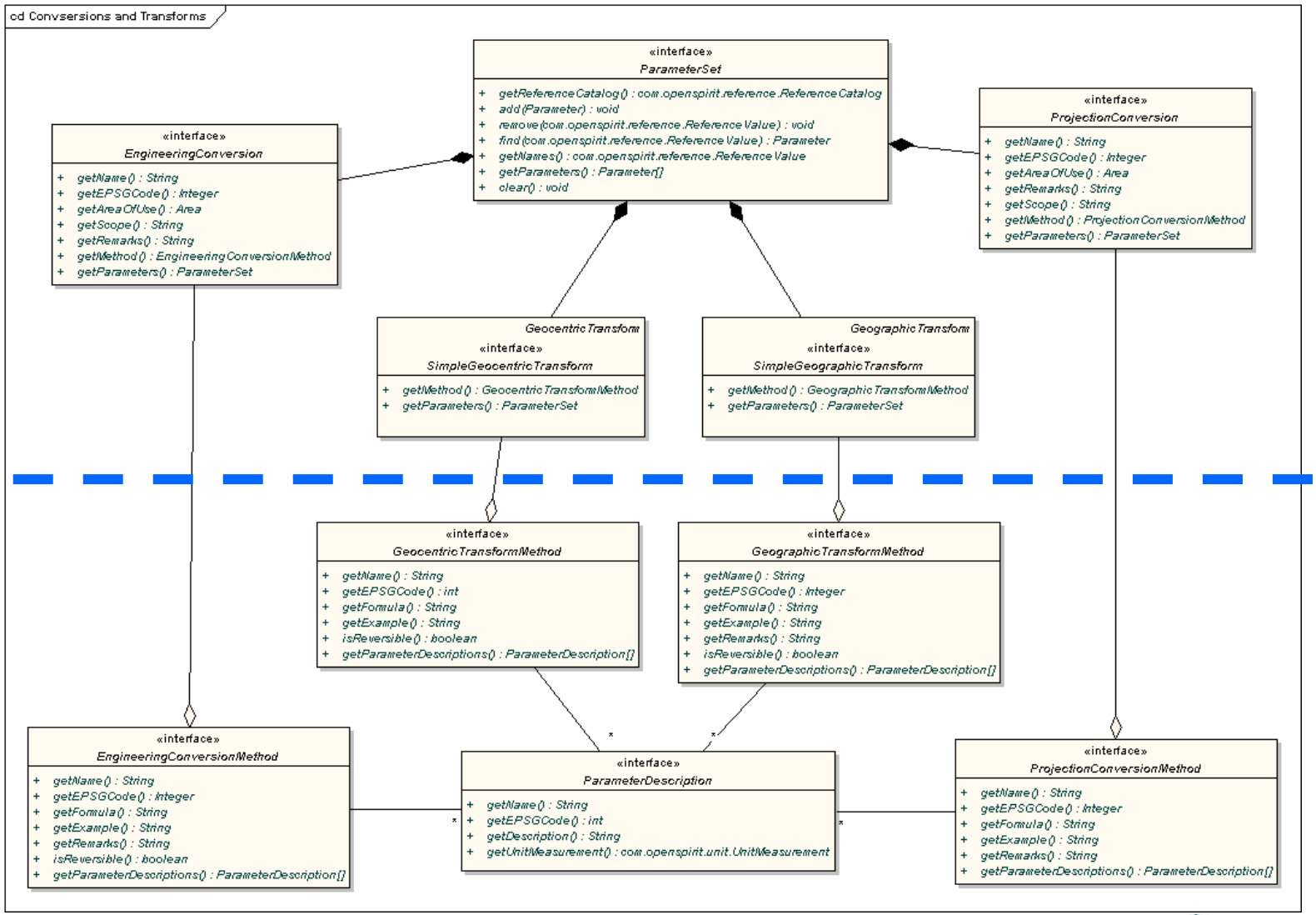
CRS

Display CRS

From	To
ED50	WGS84

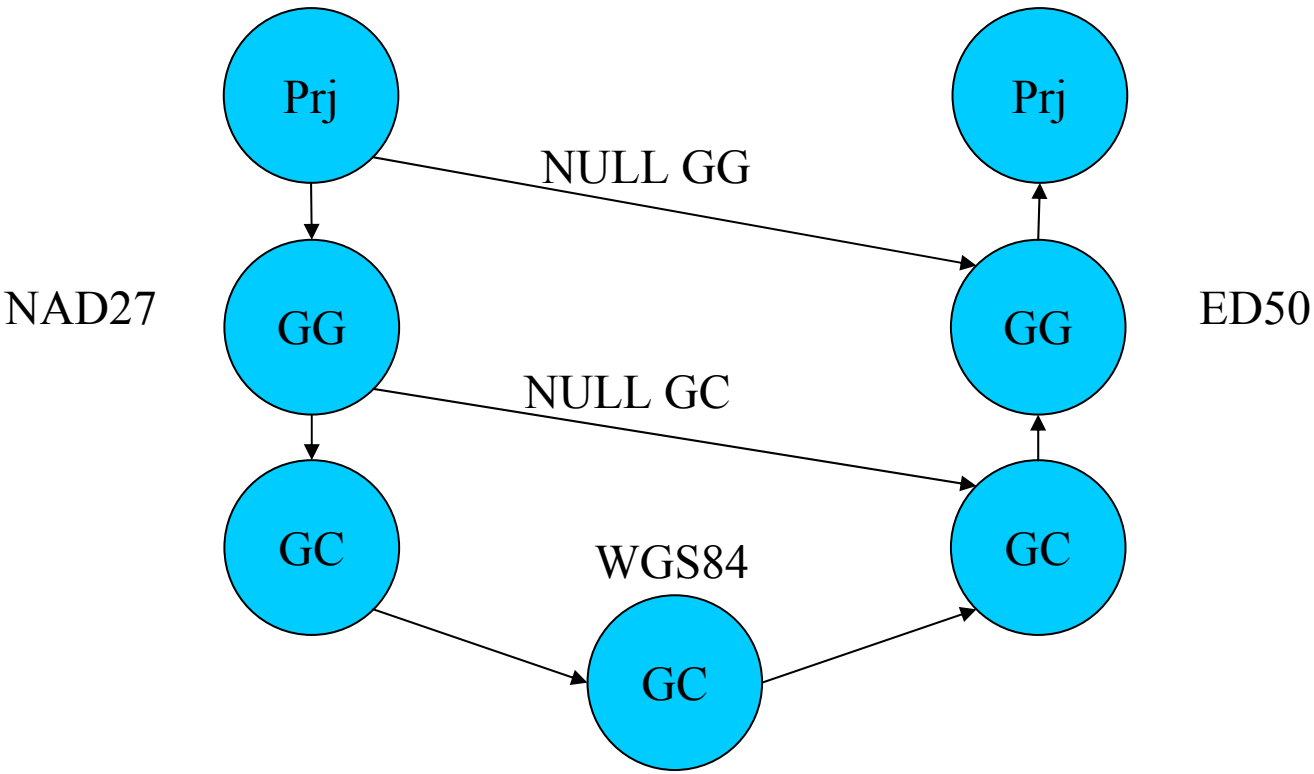
Metadata

Conversions and Transforms



Special Transform Conditions

- Ellipsoid-to-ellipsoid
  - GeographicSystem with "null" or unknown reference GeocentricSystem.
- Skipping all geographic transformation
  - ProjectionSystem with "null" or unknown reference GeographicSystem.



Other Questions For APSG

- What implementations would most appeal to your users?
- Does EPSG have plans for any implementations?
- Does EPSG have plans for certification of providers of carto implementations?
  - How do we know the quality of the implementations & metadata?