Project Overview

Funded by the European Space Agency

Project Brief

- VAROS: *Value-Adding Raster Services Based on Open Standards*
  - ESA grant no. ESRIN/22742/09/I-EC, runtime: 2009-sep-28 ... 2010-07-31
- Goal:
  - demonstrate flexibility of next-generation value-adding EO services
  - Harmonization of OGC WPS / WCPS / WCS
  - contribute to integration of EO processing services
    → Line 3 (exploitation of new enabling technologies) within EOEP-3 VAE
- Objectives:
  - Develop OGC WPS Application Profile for WCPS
  - Build demonstrator using real-life land & marine data
  - outreach activities

OGC WCPS: "SQL for Raster Coverages"

- Semantic ad-hoc navigation, extraction, aggregation, analysis

Time series

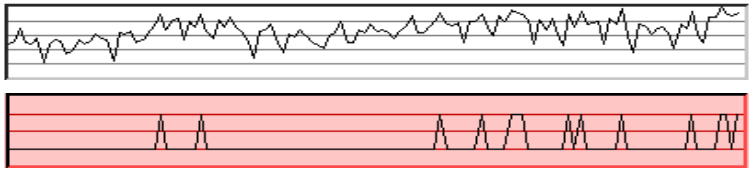
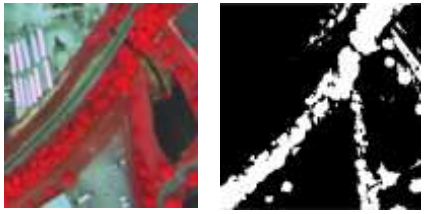
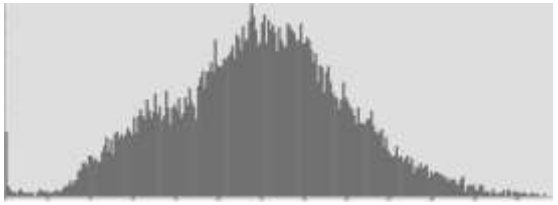


Image processing

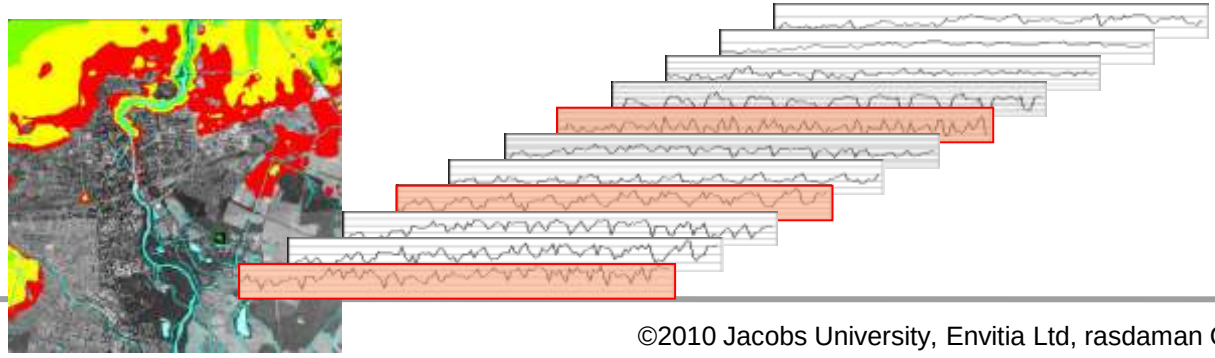




Summary data

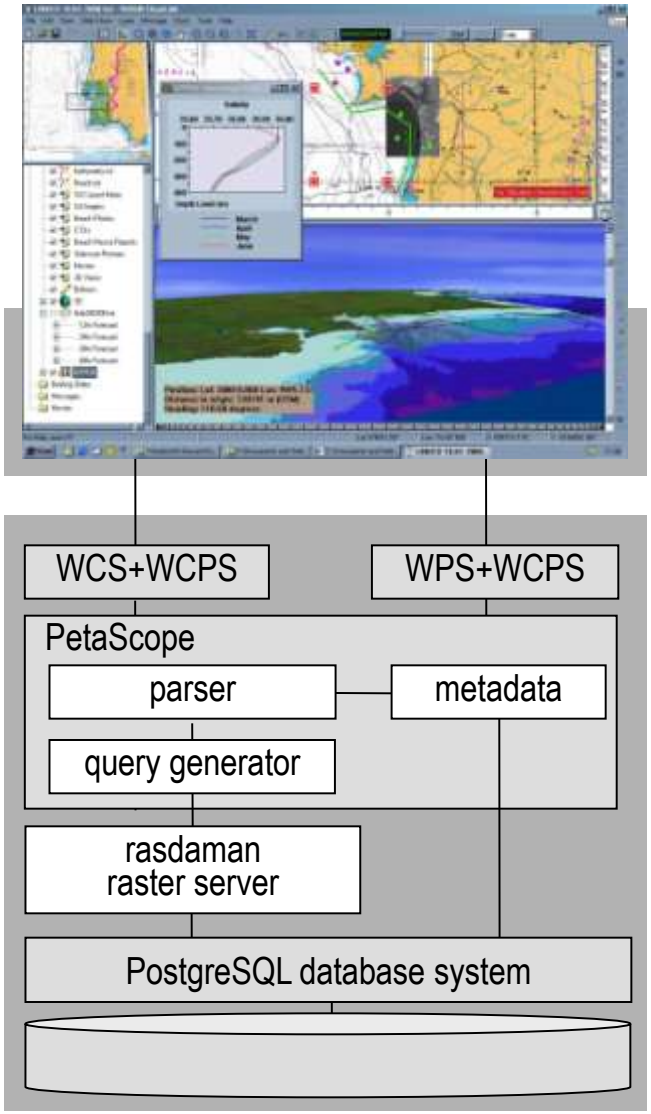
- current value is 8220.0;
- average over all values up to now currently is 7461.7692307692305.

Sensor fusion
& pattern mining



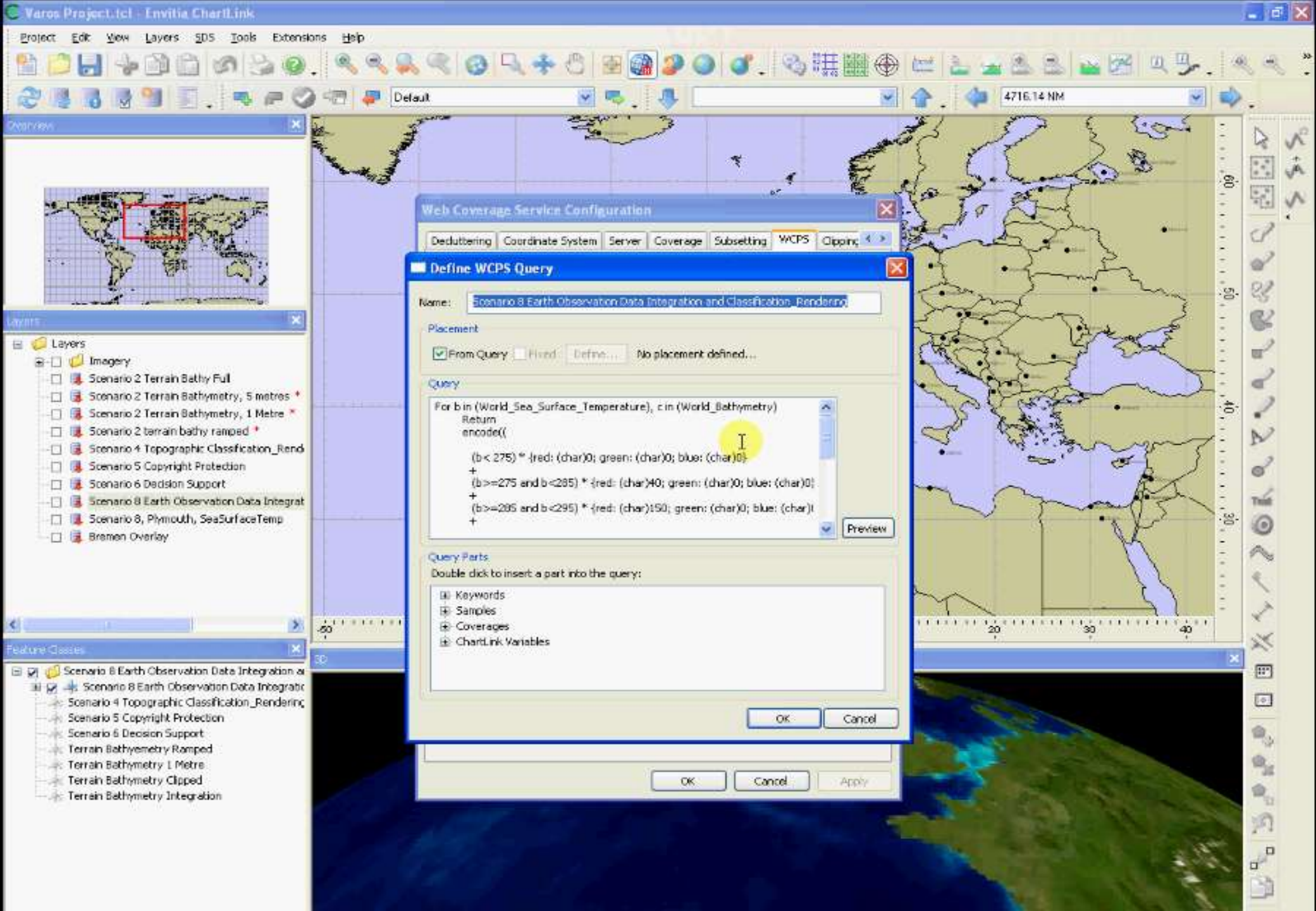
Architecture: ChartLink + rasdaman

- ChartLink (Envitia)
  - Rich geo client
- rasdaman (Jacobs University, rasdaman GmbH)
  - Multi-dimensional raster DBMS
    - open source version: Jacobs U
    - commercial version: rasdaman GmbH
  - petascope: free OGC middleware by Jacobs U; WCS, WCPS, WCS-T, WPS

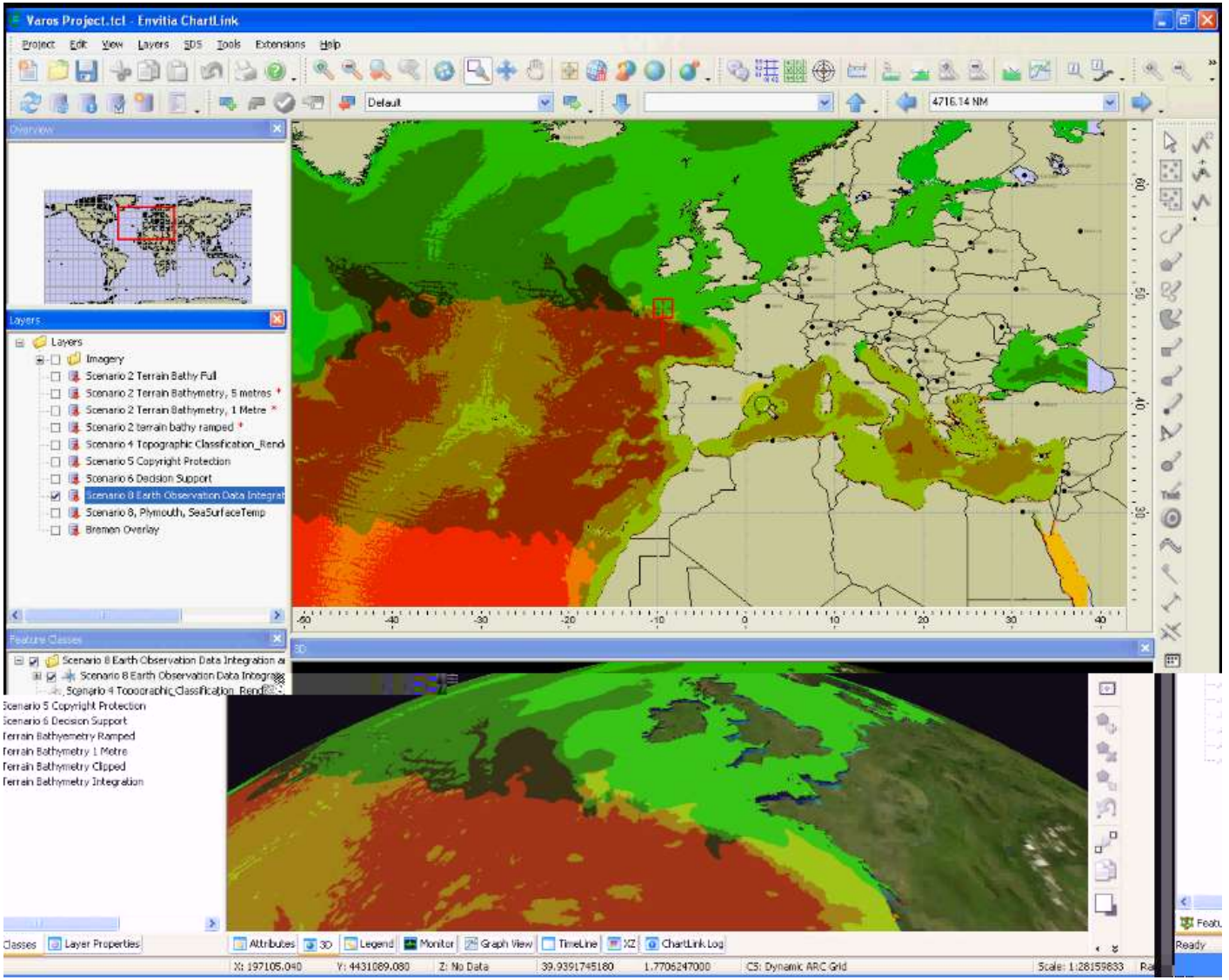


Types of Analysis that is Possible

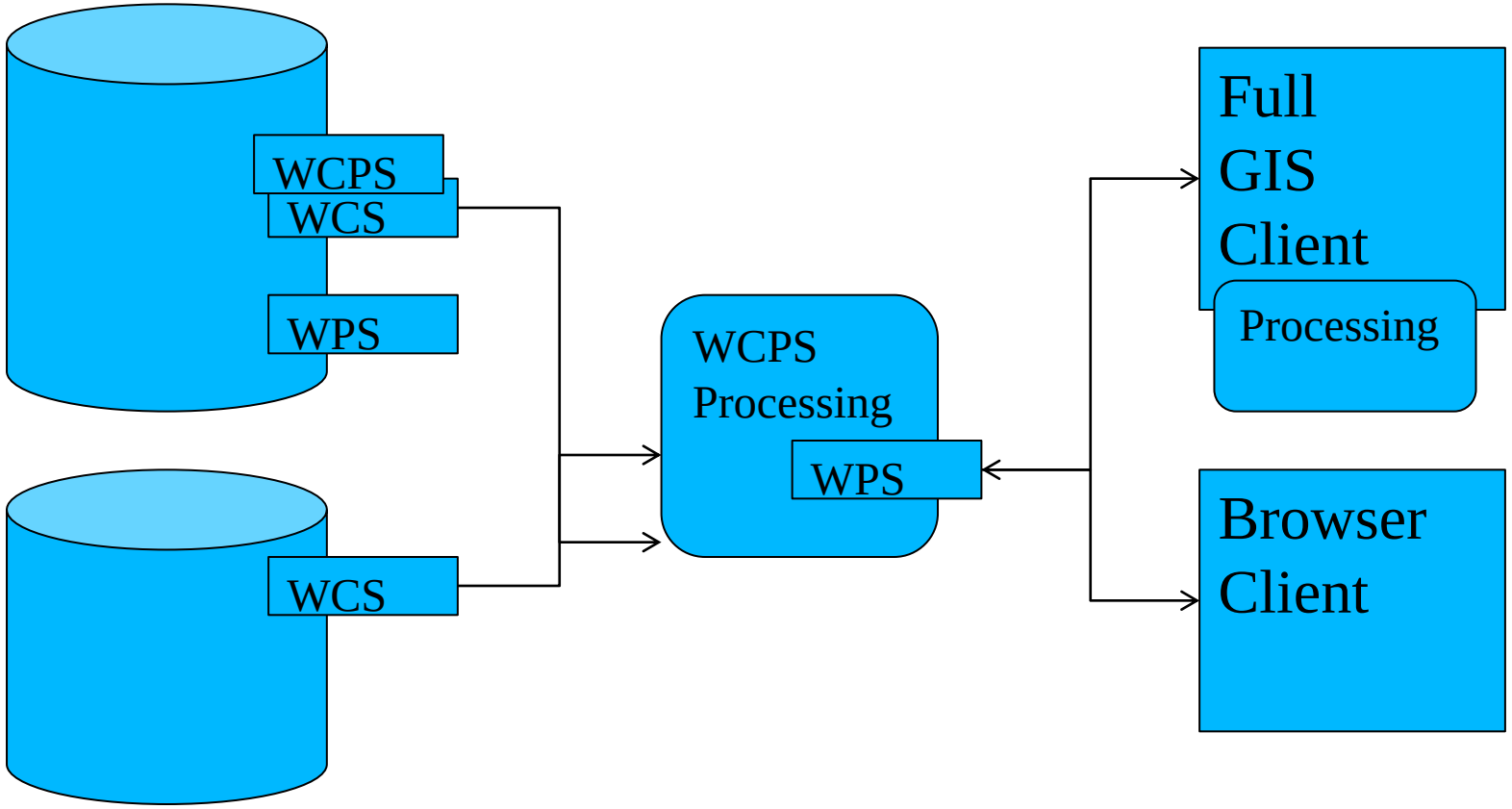
- 7 scenarios as per Requirements Analysis / Design (cf Wiki):
  - Scenario1: Ortho image retrieval
  - Scenario2: terrain/bathymetry integration
  - Scenario3: terrain slope calculation
  - Scenario4: topographic classification/rendering
  - Scenario5: Copyright protection
  - Scenario6: Decision support
  - Scenario7: Flood analysis
- Currently based on Navy / EO data;
  GDI-DE data TBD


Varos Project.tcl - Envitia ChartLink
Project Edit View Layers SDS Tools Extensions Help
Default
4716.14 NM
Overview
Layers
Layers
Imagery
Scenario 2 Terrain Bathy Full
Scenario 2 Terrain Bathymetry, 5 metres *
Scenario 2 Terrain Bathymetry, 1 Metre *
Scenario 2 terrain bathy ramped *
Scenario 4 Topographic Classification_Rend
Scenario 5 Copyright Protection
Scenario 6 Decision Support
Scenario 8 Earth Observation Data Integrat
Scenario 8, Plymouth, SeaSurfaceTemp
Bremen Overlay
Feature Classes
Scenario 8 Earth Observation Data Integration a
Scenario 8 Earth Observation Data Integratic
Scenario 4 Topographic Classification_Rendering
Scenario 5 Copyright Protection
Scenario 6 Decision Support
Terrain Bathyemetry Ramped
Terrain Bathymetry 1 Metre
Terrain Bathymetry Clipped
Terrain Bathymetry Integration
Web Coverage Service Configuration
Decluttering Coordinate System Server Coverage Subsetting WCPS Clipping
Define WCPS Query
Name: Scenario 8 Earth Observation Data Integration and Classification_Rendering
Placement
From Query Fixed Define... No placement defined...
Query
For b in (World_Sea_Surface_Temperature), c in (World_Bathymetry)
Return
encode((
(b< 275) * {red: (char)0; green: (char)0; blue: (char)0}
+
(b>=275 and b<285) * {red: (char)40; green: (char)0; blue: (char)0}
+
(b>=285 and b<295) * {red: (char)150; green: (char)0; blue: (char)
+
Preview
Query Parts
Double click to insert a part into the query:
Keywords
Samples
Coverages
ChartLink Variables
OK Cancel
OK Cancel Apply
3D

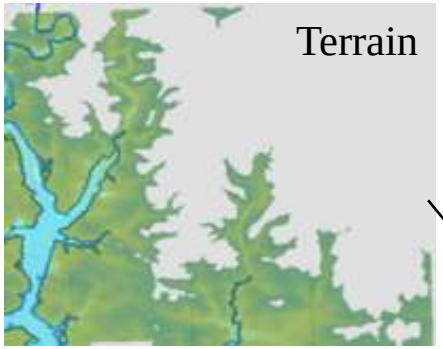
Resulting Analysis



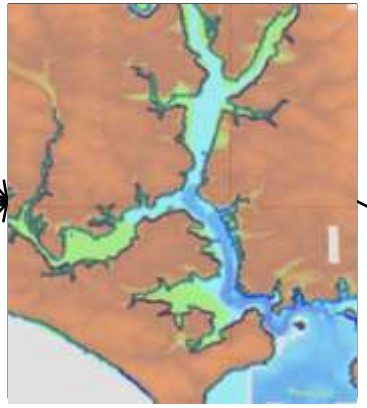
Architecture integrating WCPS



Fusing/Analysing Coverages

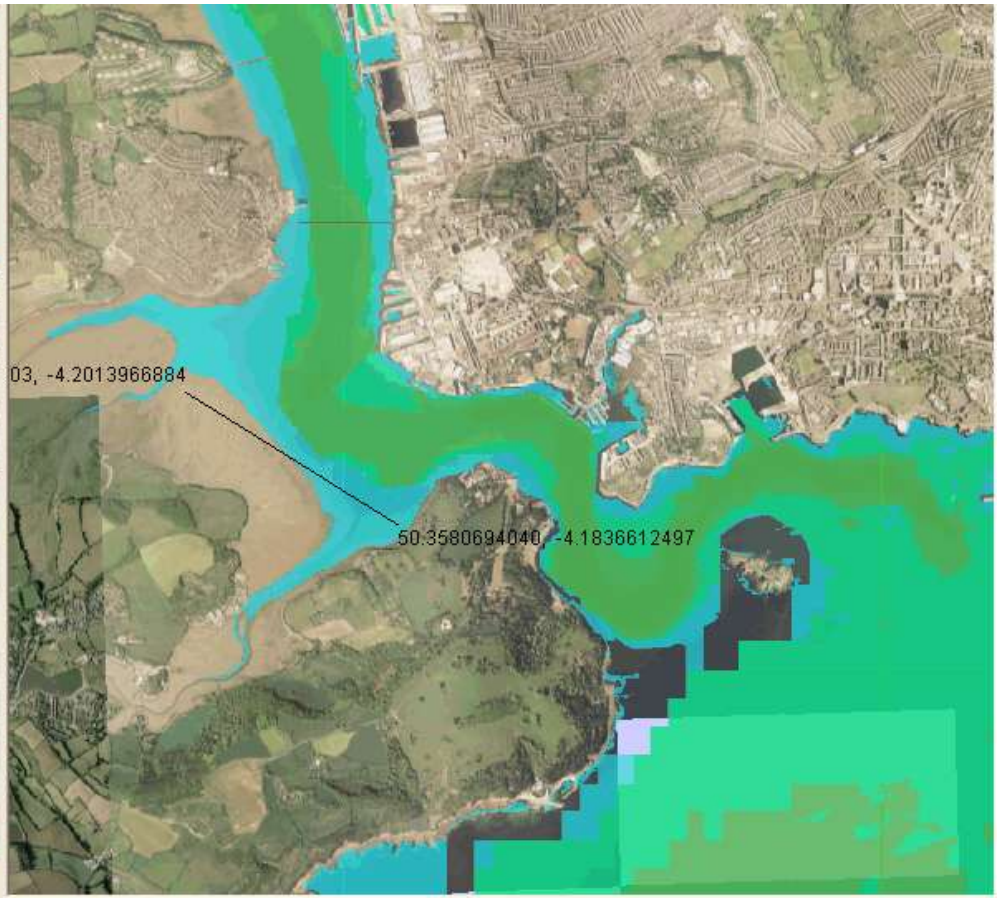


Earth Surface Result



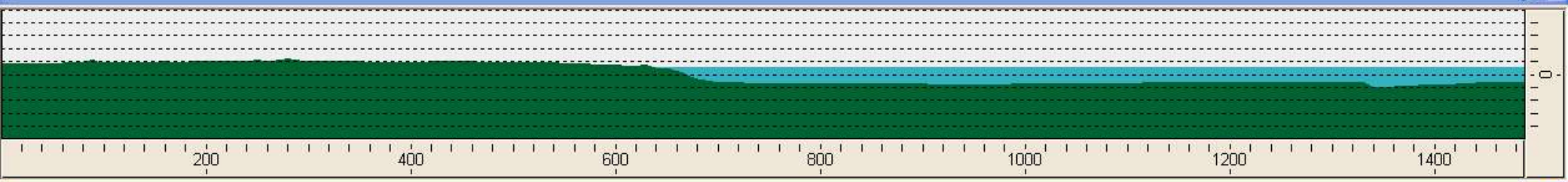
Water Level

Water Level Analysis

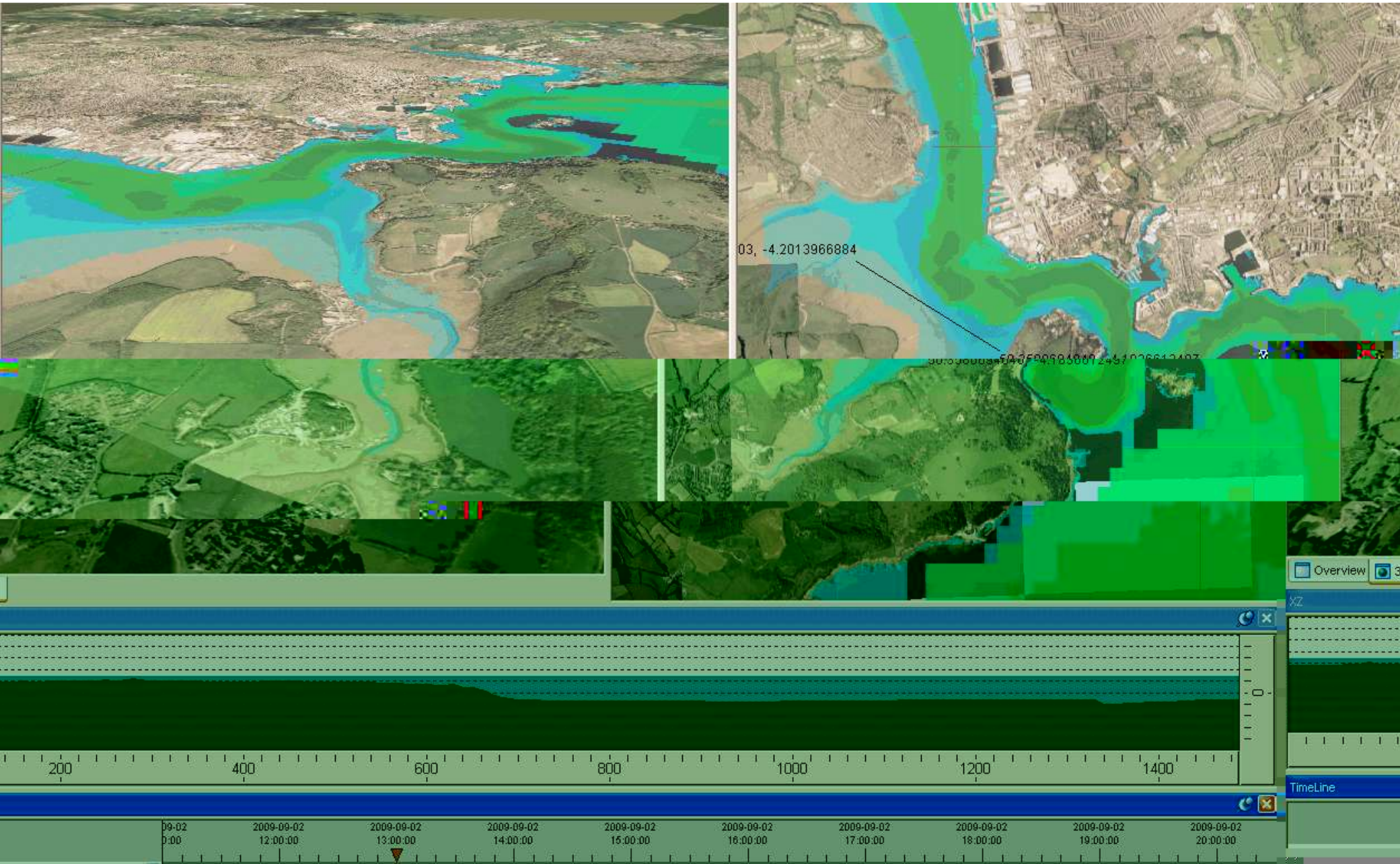


Overview 3D

XZ



TimeLine


03, -4.2013966884
Overview
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1400
TimeLine
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03, -4.2013966884
50.3580694040, -4.1836612497
Overview
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Conclusion

- OGC WCPS as an open, interoperable raster query language
- VAROS proves feasibility of WCPS for navigation, visualization, and decision support
  - Implementation of standard has been trialled using ChartLink and rasdaman. Can support fully functional browser-based GIS data analysis
  - Interoperability & virtualized processing: exploit new architectures and hardware while using generic, lightweight frontends
  - Flexibility: new queries added on the fly, can be parametrized
- *But is a WCPS and for that matter a WFPS like set of generic processing services useful/the best answer?*