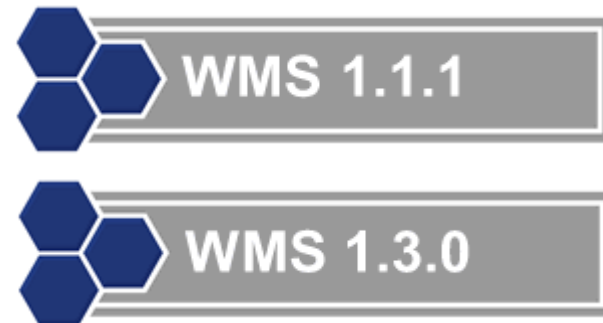


Towards a  
Web MetOcean Model Map Service  
(WM<sup>3</sup>S)  
profile of WMS

This is great ...

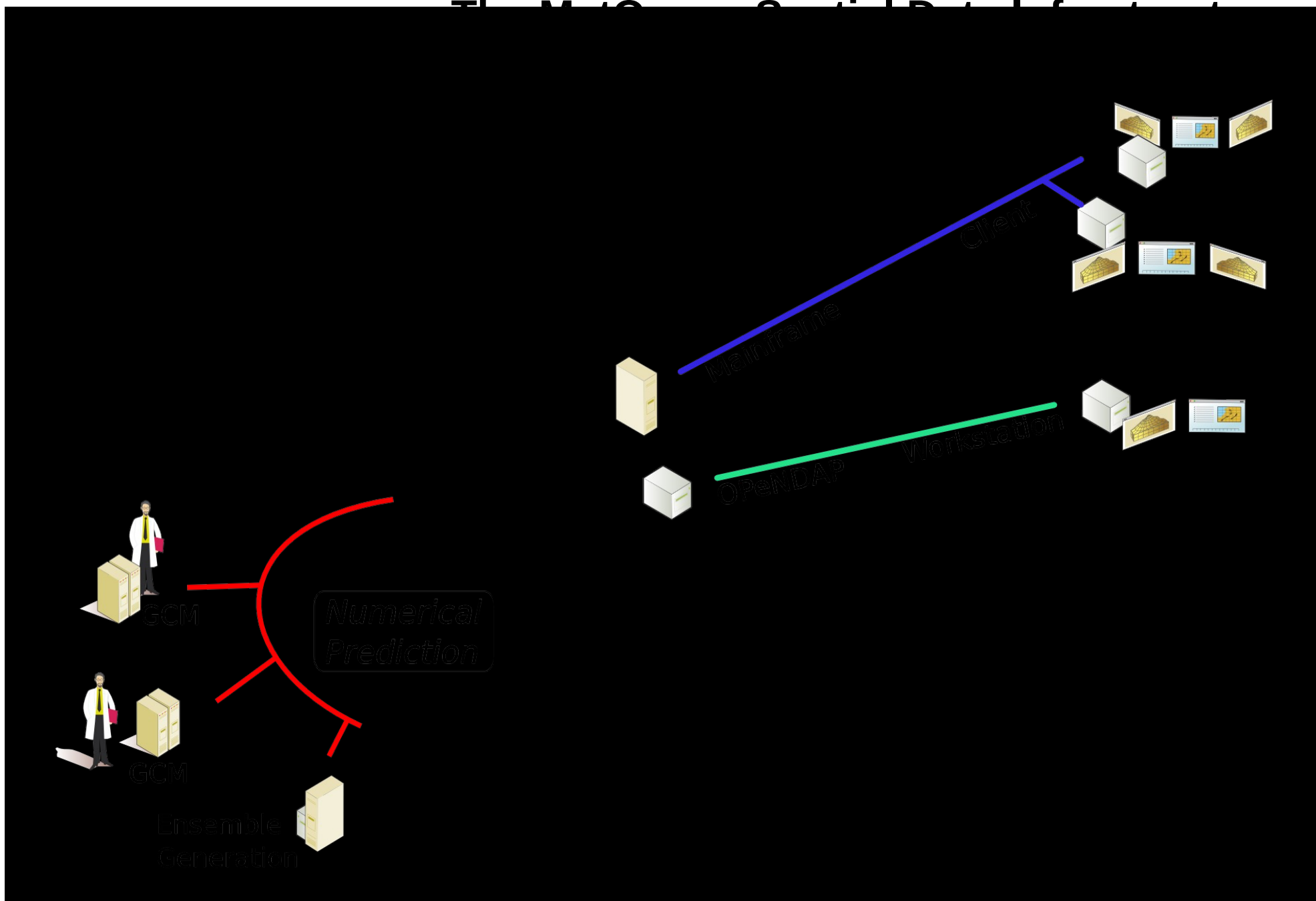
... but we are still confused

What a mess ...



# WMS?

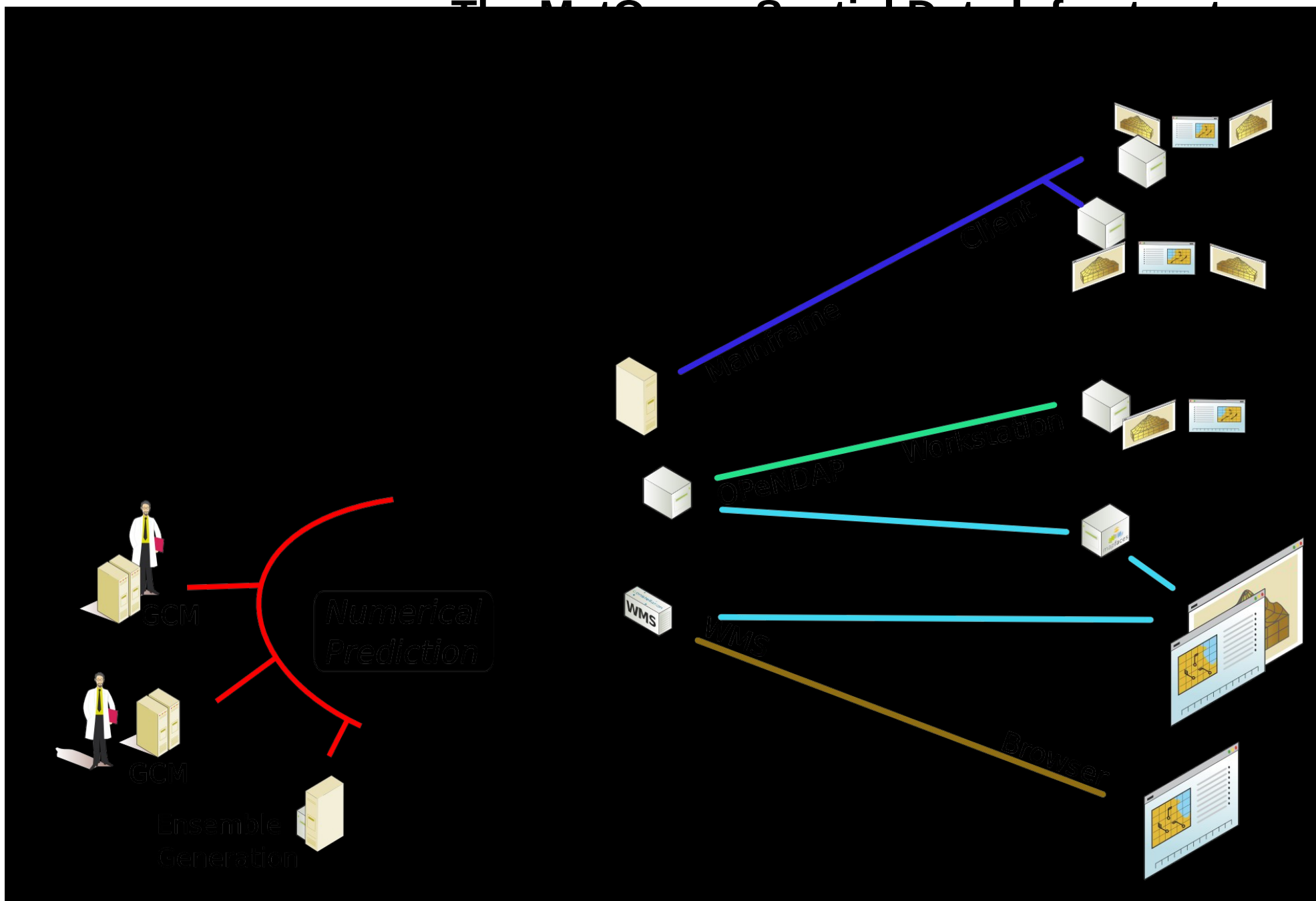
# The Met Office Data Platform



# Why WMS?

- Current system works
  - Production
  - Use
- use WCS?
- benefit from CSW?
- others?
- Web is cool
- INSPIRE
- Start simple

# The Met Office Data Platform



# WMS!

# How WMS?

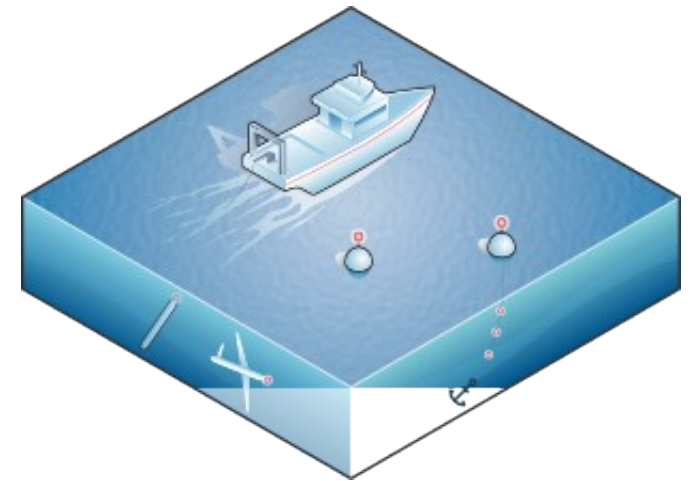
- *What maps to provide?*
- *How to provide the maps?*



# What Maps to Provide?

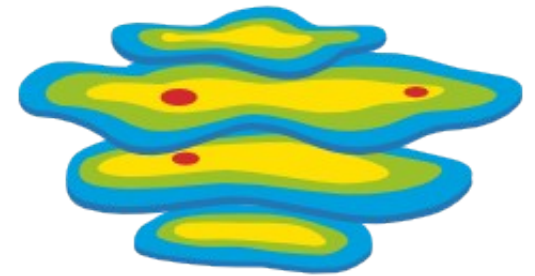
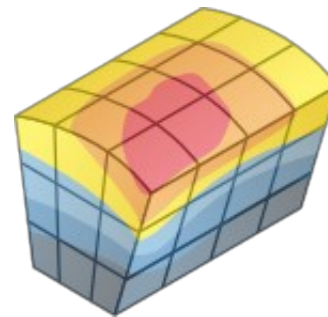
- Observations

- METAR
- Station Reports
- Ship / Buoy sensors
- Balloon soundings
- Profiles
- Satellite
- Radar



- Numerical Prediction

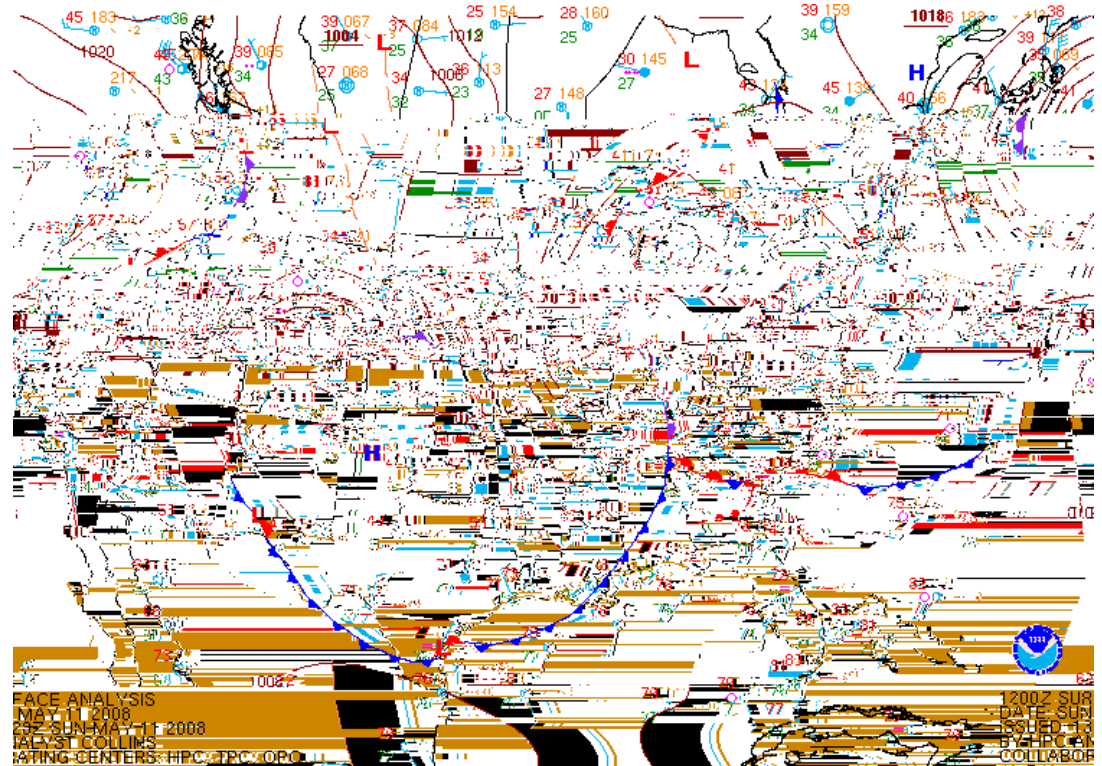
- General Circulation Models
- Ensemble



# What Maps to Provide?

- Observations

- METAR
- Station Reports
- Ship / Buoy sensors
- Balloon soundings
- Profiles
- Satellite
- Radar



- Numerical Prediction

- General Circulation Models
- Ensemble

# *What Maps to Provide?*

## Producer View

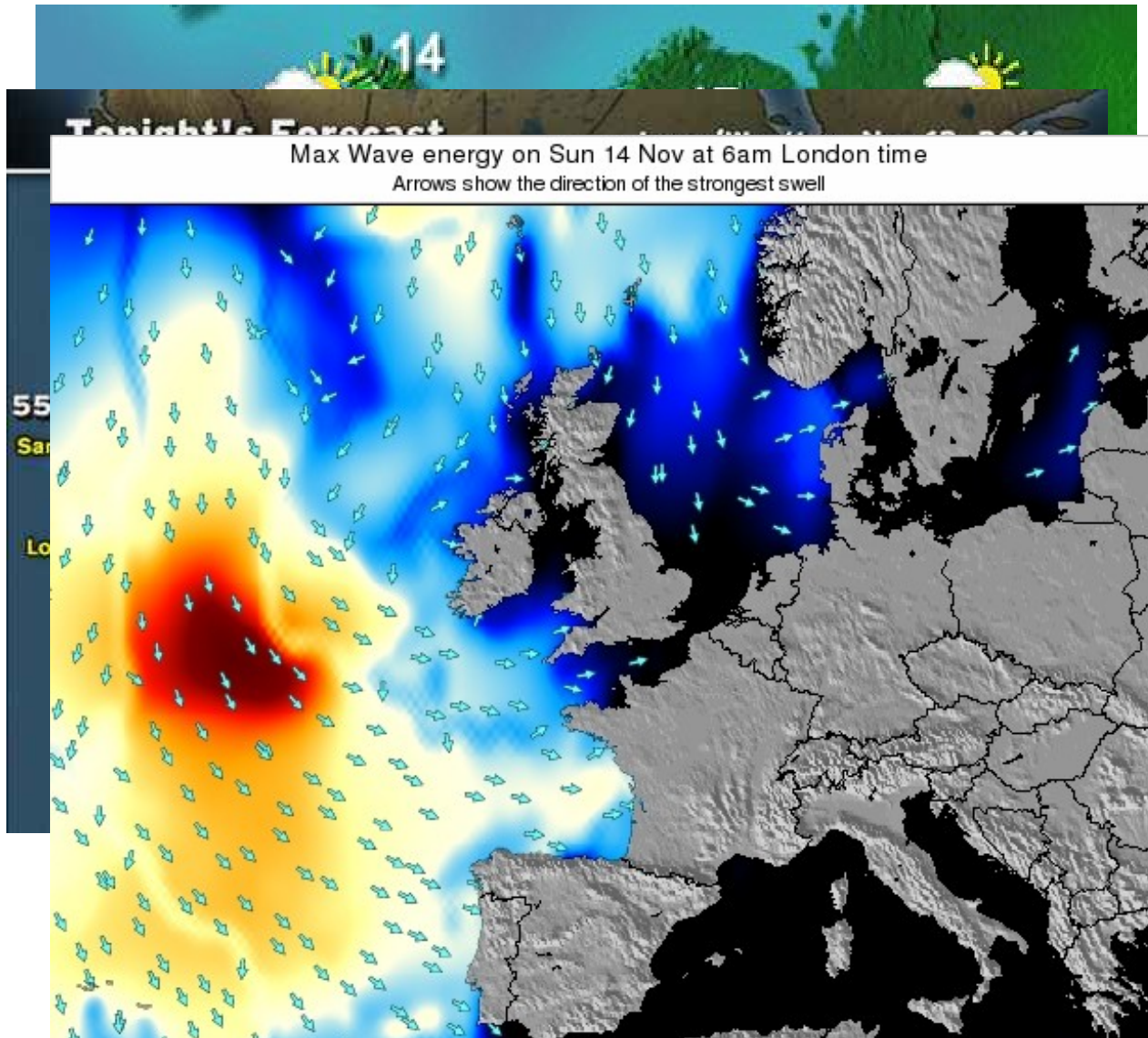
- Observations
  - METAR
  - Station Reports
  - Ship / Buoy sensors
  - Balloon soundings
  - Profiles
  - Satellite
  - Radar
- Numerical Prediction
  - General Circulation Models
  - Ensemble

## User View

- *Past*
- *Present*
- *Near Future*
- *Longer Future*
- General Public
- Domain Worker
- Meteorologist
  - Forecaster
  - Modeler

# What Maps to Provide?

User View



General Public

# *What Maps to Provide?*

## User View

- Farminu: Day-degrees ( $D^\circ$ )
  - Disaster: Cumulative rainfall
  - ...
- Domain Worker

## Use-Cases!

# What Maps to Provide?

## Producer View

- Observations
  - METAR
  - Station Reports
  - Ship / Buoy sensors
  - Balloon soundings
  - Profiles
  - Satellite
  - Radar
- Numerical Prediction
  - General Circulation Models
  - Ensemble

## User View

- *Past*
- *Present*
- *Near Future*
- *Longer Future*
- General Public
- Domain Worker
- Meteorologist
  - Forecaster
  - Modeler

**Goal** ► Accumulate 20 examples: need, map, source data.

# *How to Provide the Maps?*

## Design:

- WMS Endpoints
  - Number
  - Persistence
- WMS setup
  - Declaration
  - Content structure
  - Style support

## Evaluation:

### Client use

- Discovery
- Available layers
- Layer parameters

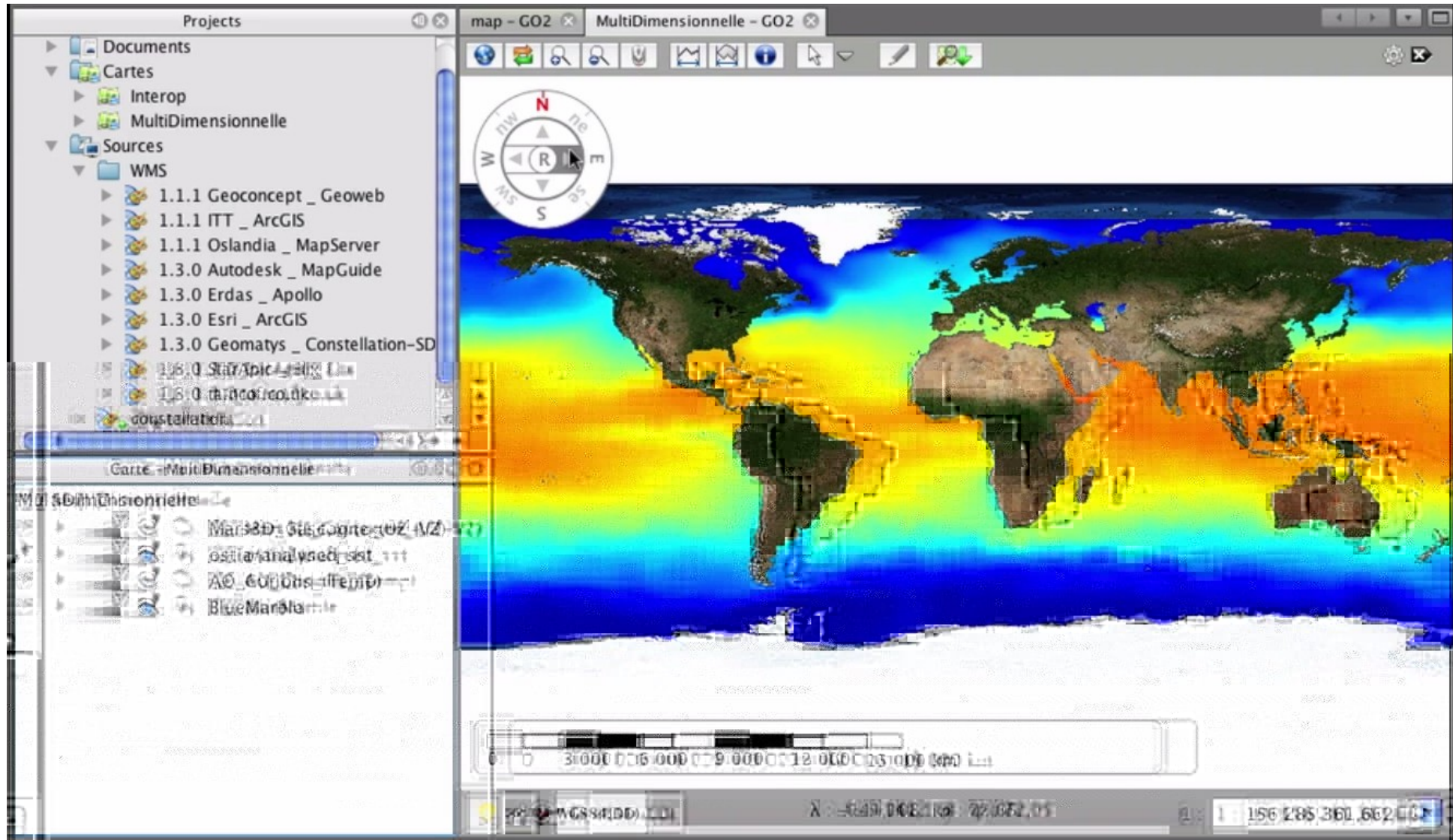
### Semantics

- Metadata
- Convention

### Handling

- Update cycle

# WMS IE Prototype





# WMS Endpoints

## ESSC Web Map Service for environmental data

[Contact info](#)

The system administrator has disabled the generation of Capabilities documents that include all datasets on this server.

[Access interface \(requires login\)](#)

### Datasets:

Dataset	GetInfo links	Test GetMap: image/png	Test GetMap: image/jpeg	Test GetMap: application/vnd.google-earth.kml+xml	Test GetMap: image/gif
<b>POLCOMS MDCs</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>ORFIA SST analysis</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>POAM one degree global</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>UK Waters status</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>GENIE Example data</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>POCOMS WIND</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>BlackEM</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>SOCA POP</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>ORFIA SST analysis (up to 2006-11-01)</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>Test error data</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>UK TRACKER LAYER 10</b>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>
<b>UK Error data</b> WMS 1.1.0 WMS 1.1.1 FES variables (requires login)	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>	<a href="#">GetInfo</a> <a href="#">GetCapabilities</a> <a href="#">GetMap</a> <a href="#">GetLegend</a>

# WMS Setup

## WMS Capabilities

```
<Capabilities>  
  <ServiceIdentification/>  
  <ServiceProvider/>  
  <OperationsMetadata/>  
  <Languages/>  
  <ServiceConstraints/>  
  <Contents>  
    <Layer/>  
  </Contents>  
  <WSDL>  
  <ServiceMetadataURL>  
  <_ExtendedCapabilities>  
</Capabilities>
```

# WMS Setup

## WMS Layer structure

- Flat

```
<Contents>  
  <Layer />  
  <Layer />  
  <Layer />  
</Contents>
```

# WMS Setup

## WMS Layer structure

- Flat

```
<Contents>  
  <Layer id="Temp_2010.10.10.1010_gfs"/>  
  <Layer id="Temp_2010.10.10.1620_gfs"/>  
  <Layer id="Temp_2010.10.10.2230_gfs"/>  
</Contents>
```

# WMS Setup

## WMS Layer structure

- Flat
- Nested

```
<Contents>  
  <Layer/>  
  <Layer>  
    <Layer>  
      </Layer>  
    </Layer>  
  </Layer>  
</Contents>
```

# WMS Setup

## WMS Layer structure

- Flat
- Nested

```
<Contents>  
  <Layer id="Model"/>  
    <Layer id="Run">  
      <Layer id="PhysParm">  
      </Layer>  
    </Layer>  
  </Layer>  
</Contents>
```

# WMS Setup

## WMS Layer structure

- Flat
- Nested
- Dimensional

```
<Contents>  
  <Layer/>  
    <Dimensions>  
      <Dimension>  
  
    </Dimensions>  
  </Dimensions>  
  </Layer>  
</Contents>
```

# How to Provide the Maps?

## Design:

- WMS Endpoints
  - Number
  - Persistence
- WMS setup
  - Declaration
  - Content structure
  - Style support

## Evaluation:

### Client use

- Discovery
- Available layers
- Layer parameters

### Semantics

- Metadata
- Convention

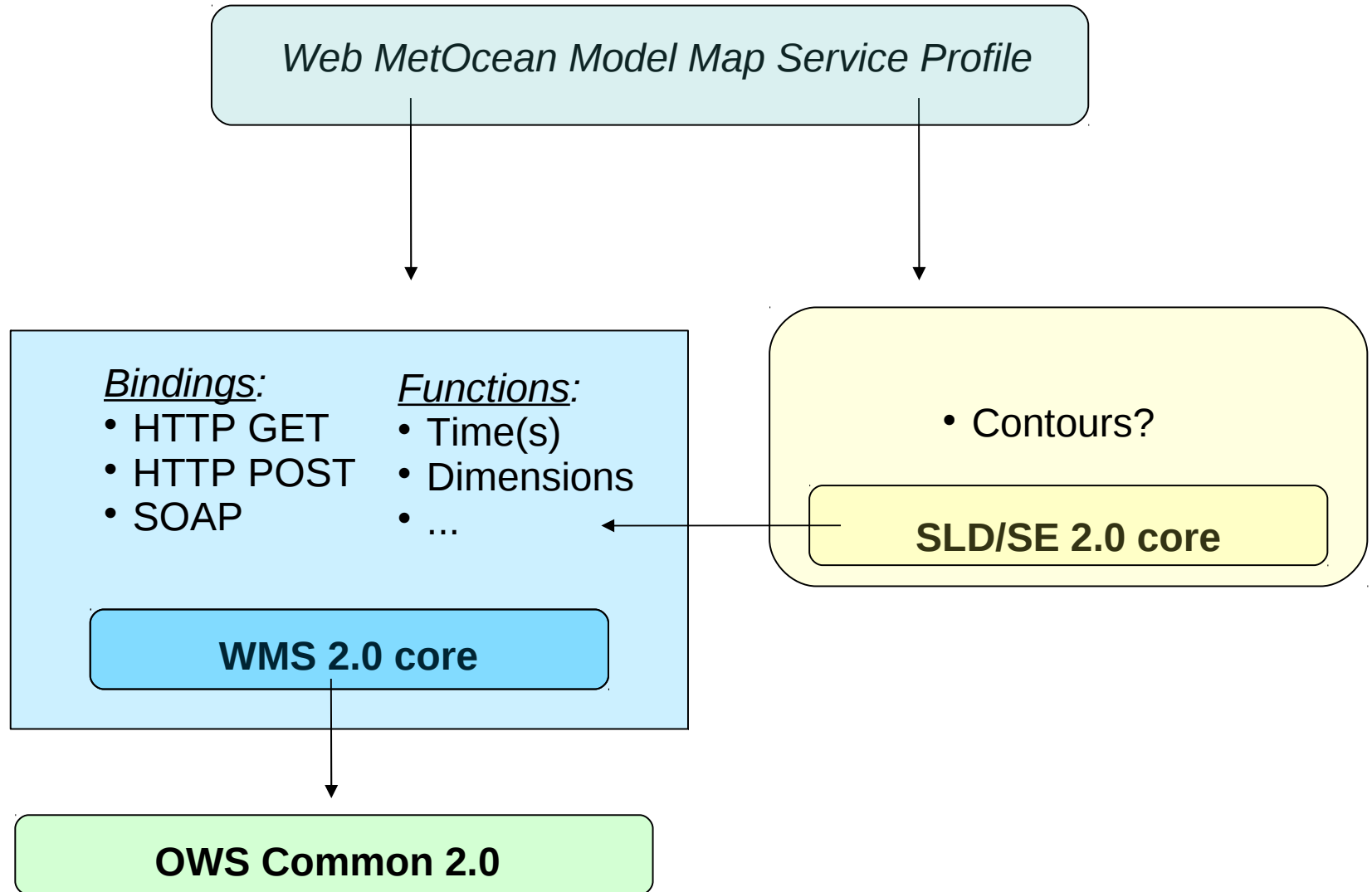
### Handling

- Update cycle

**Goal ► Work through each and evaluate**



# The WM<sup>3</sup>S Profile



*Questions?*



