

A photograph of a forest stream with sunlight filtering through the trees, creating a dappled light effect on the water and surrounding greenery.

Participants

- **SIS, Swedish Standard Institute**
- **Swedish Land Survey,**
- **Elforsk**
- **Water District Authorities**
- **Swedish Environmental Protection Agency**
- **Swedish Maritime Administration**
- **Swedish Association of Local Authorities and Regions**
- **Swedish Geological Survey**
- **Swedish Meteorological and Hydrological Institute, SMHI**

A wide-angle photograph of a landscape featuring a large body of water, a bridge, and a town in the distance under a blue sky with scattered clouds.

Scope

- ✓ supply a framework for information content and structure
- ✓ supply a common set of terms and concepts
- ✓ facilitate exchange of data between organizations
- ✓ facilitate consolidation of data from several producers
- ✓ simplify development of software applications
make data sampling more cost effective
- ✓ simplify generalizations between different scales
- ✓ supply a system independent exchange format

Content of the standard

- Definitions
- Hierarchy
- Network
- Hierarchy.network
- Identifiers
- Versioning
- Geometry ISO 19107 and GML
- Temporal ISO 19108
- Metadata ISO 19115
- Application schema uses ISO 19109
- Data exchange XML (ISO 19118) and GML (ISO 19136)

Object oriented approach

Objects are of a defined feature class



Lakes



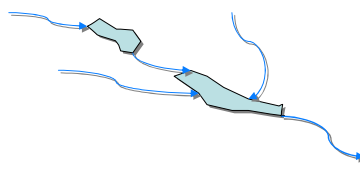
River Reaches



Sampling Points



Catchment Areas



Surface Water Systems

Object oriented approach



Attributes

Identity

Name

Geometry

Etc.

Relation to other objects

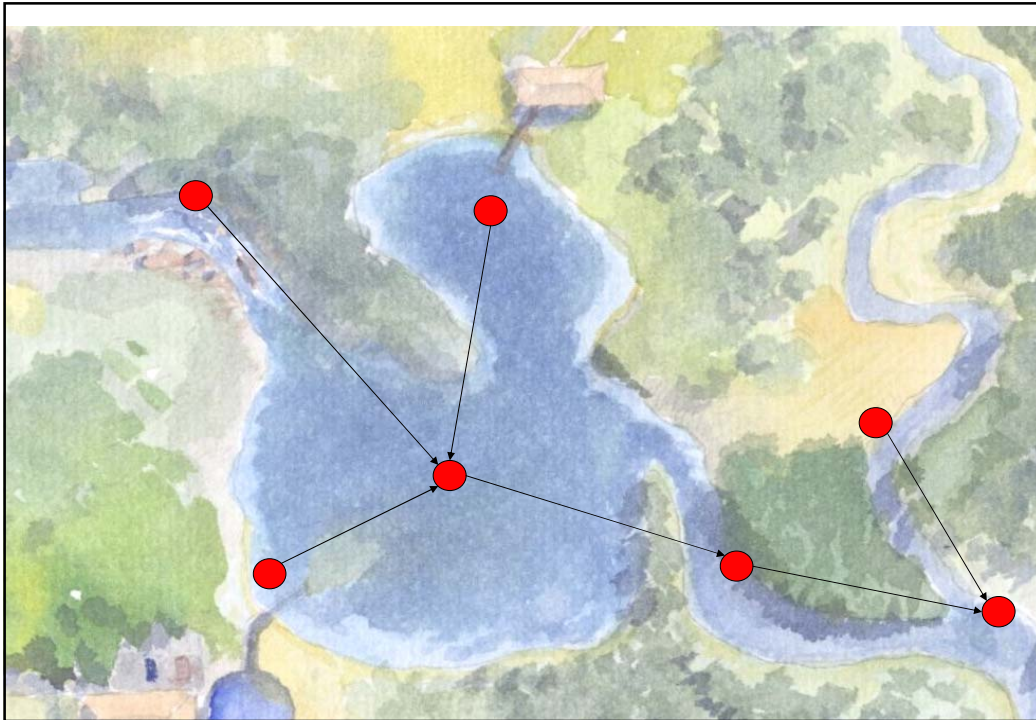
Ex) Part of a system

Or "Water received from"



Logical network

- ✓ Each feature is described as a node referenced by its identity UUID
- ✓ Each feature can be connected to other using a link
- ✓ Not dependent on geometry
- ✓ Simple to apply in database tables and queries

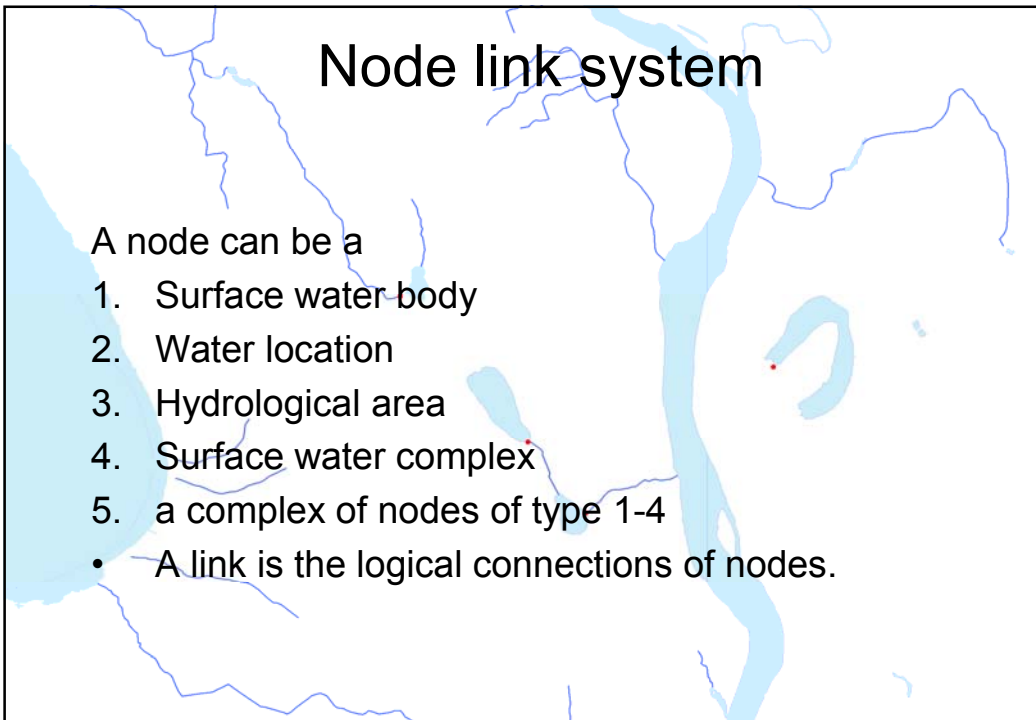


Node link system

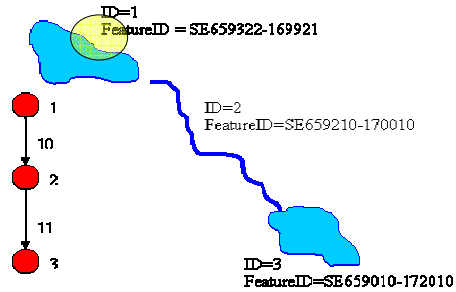
A node can be a

1. Surface water body
2. Water location
3. Hydrological area
4. Surface water complex
5. a complex of nodes of type 1-4

- A link is the logical connections of nodes.

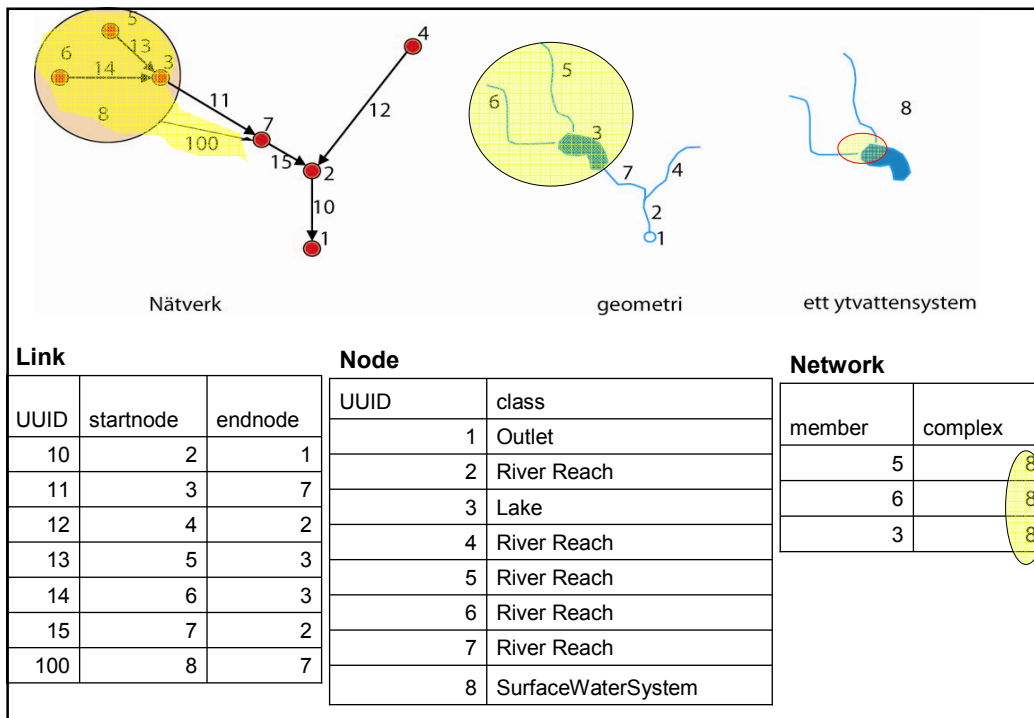
A schematic diagram of a node-link system. It features a network of blue lines representing water bodies and red dots representing nodes. The nodes are connected by lines, forming a complex network. The diagram is overlaid on a light blue background that resembles a map of water bodies.

Example of network implementation



Länktabell		
linkID	startnode	endnode
10	1	2
11	2	3

Nodtabell			
ID	FeatureID	Incoming	outgoing
1	SE659322-169921		10
2	SE659210-170010	10	11
3	SE659010-172010	11	



Link

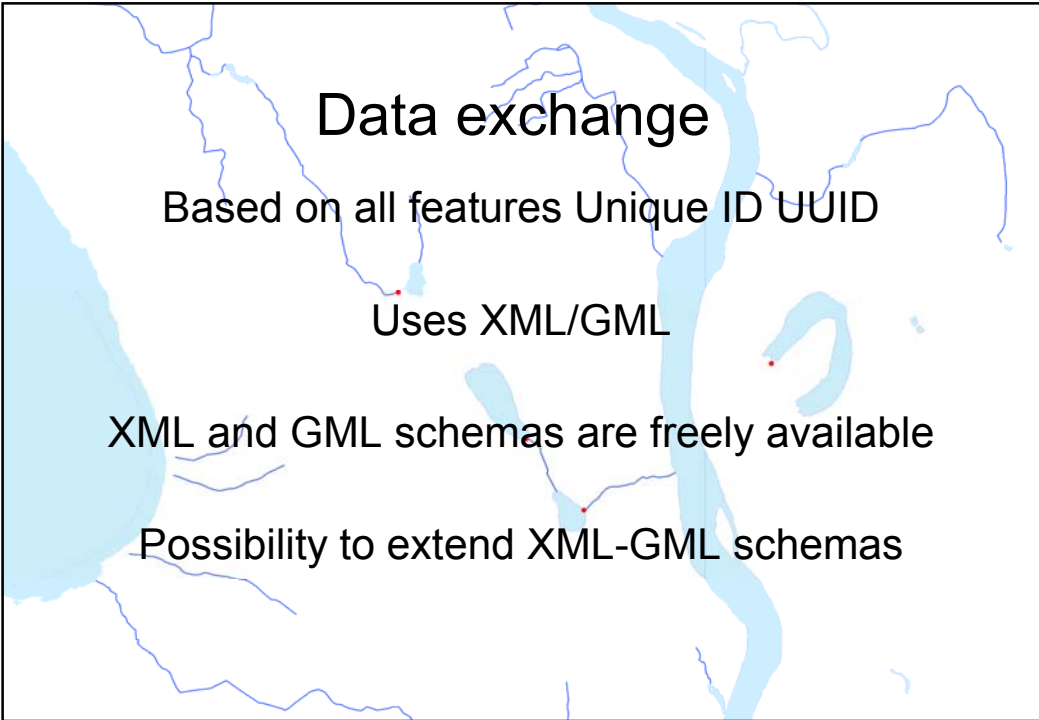
UUID	startnode	endnode
10	2	1
11	3	7
12	4	2
13	5	3
14	6	3
15	7	2
100	8	7

Node

UUID	class
1	Outlet
2	River Reach
3	Lake
4	River Reach
5	River Reach
6	River Reach
7	River Reach
8	SurfaceWaterSystem

Network

member	complex
5	8
6	8
3	8

A map of Sweden showing its coastline and major water bodies. Three red dots are placed on the map, indicating specific locations. The text is overlaid on the map.

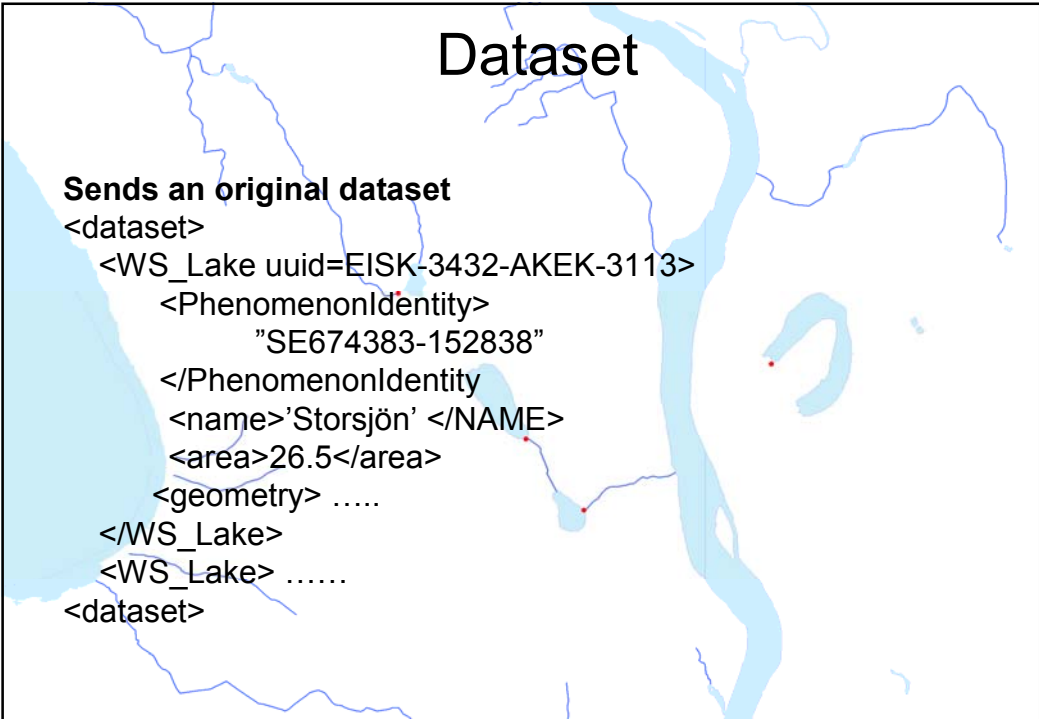
Data exchange

Based on all features Unique ID UUID

Uses XML/GML

XML and GML schemas are freely available

Possibility to extend XML-GML schemas

A map of Sweden showing its coastline and major water bodies. Three red dots are placed on the map, indicating specific locations. The XML code is overlaid on the map.

Dataset

Sends an original dataset

```
<dataset>
  <WS_Lake uuid=EISK-3432-AKEK-3113>
    <PhenomenonIdentity>
      "SE674383-152838"
    </PhenomenonIdentity>
    <name>'Storsjön' </NAME>
    <area>26.5</area>
    <geometry> .....
  </WS_Lake>
  <WS_Lake> .....
</dataset>
```

Modify (update)

Sends a modification on the area of Storsjön

```
<update>
  <modify>
    <WS_Lake uuid=EISK-3432-AKEK-3113>
      <area> 23.8 </area>
    </WS_Lake>
  </modify>
</update>
```

Modify (add)

Send an update adding a new lake to the dataset.

```
<update>
  <add>
    <WS_Lake uuid=BKKE-2232-GTEK-8923>
      <PhenomenonIdentity>
        "SE654713-147901"
      </PhenomenonIdentity>
      <name>'lillsjön' </NAME>
      <area>3.2</area>
      <geometry> .....
    </WS_Lake>
  </add>
</update>
```


Modify (delete)

Sends an update deleting a lake from the dataset

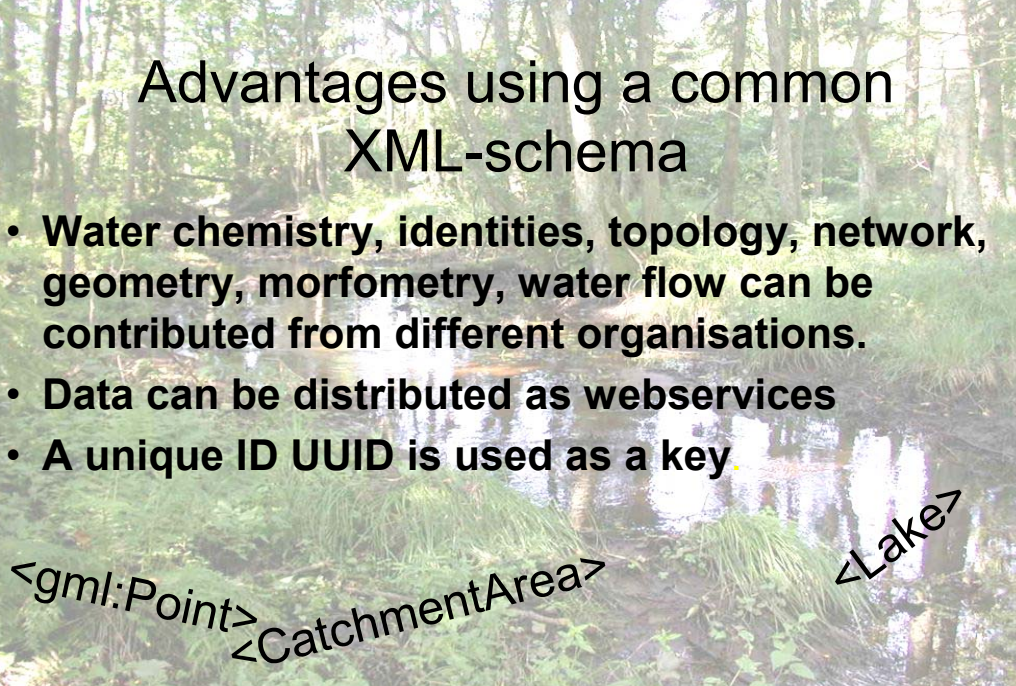
```
<update>  
  <delete uuidref="EISK-3432-AKEK-3113" />  
</update>
```

A map showing a network of blue lines representing rivers and streams. A specific lake is highlighted in a darker blue. A red dot is placed on the lake, indicating its location. The text 'Modify (delete)' is centered at the top, and the XML code is positioned to the left of the map.

Advantages using a common XML-schema

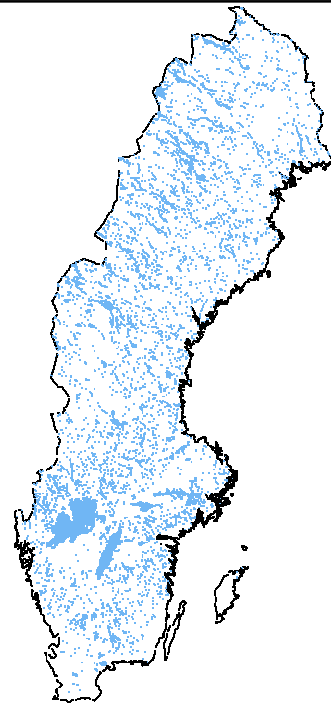
- Water chemistry, identities, topology, network, geometry, morfometry, water flow can be contributed from different organisations.
- Data can be distributed as webservice
- A unique ID UUID is used as a key

<gml:Point> <CatchmentArea> <Lake>

A photograph of a lush green forest with a stream flowing through it. The water is clear and reflects the surrounding trees. The text 'Advantages using a common XML-schema' is centered at the top, and the list of advantages is below it. The XML tags are placed at the bottom of the image, with arrows pointing to specific features in the landscape.

conclusions

- Standardization – cooperation
- Standardization – takes time
- Object orientated – takes time
- Lots of work to build datasets
 - 100 000 - 300 000 lakes
 - 500 000 km river
- Growing demand for "intelligent" datasets
- Possibility to chose ambition



THANK YOU !

For more information

www.stanli.se

