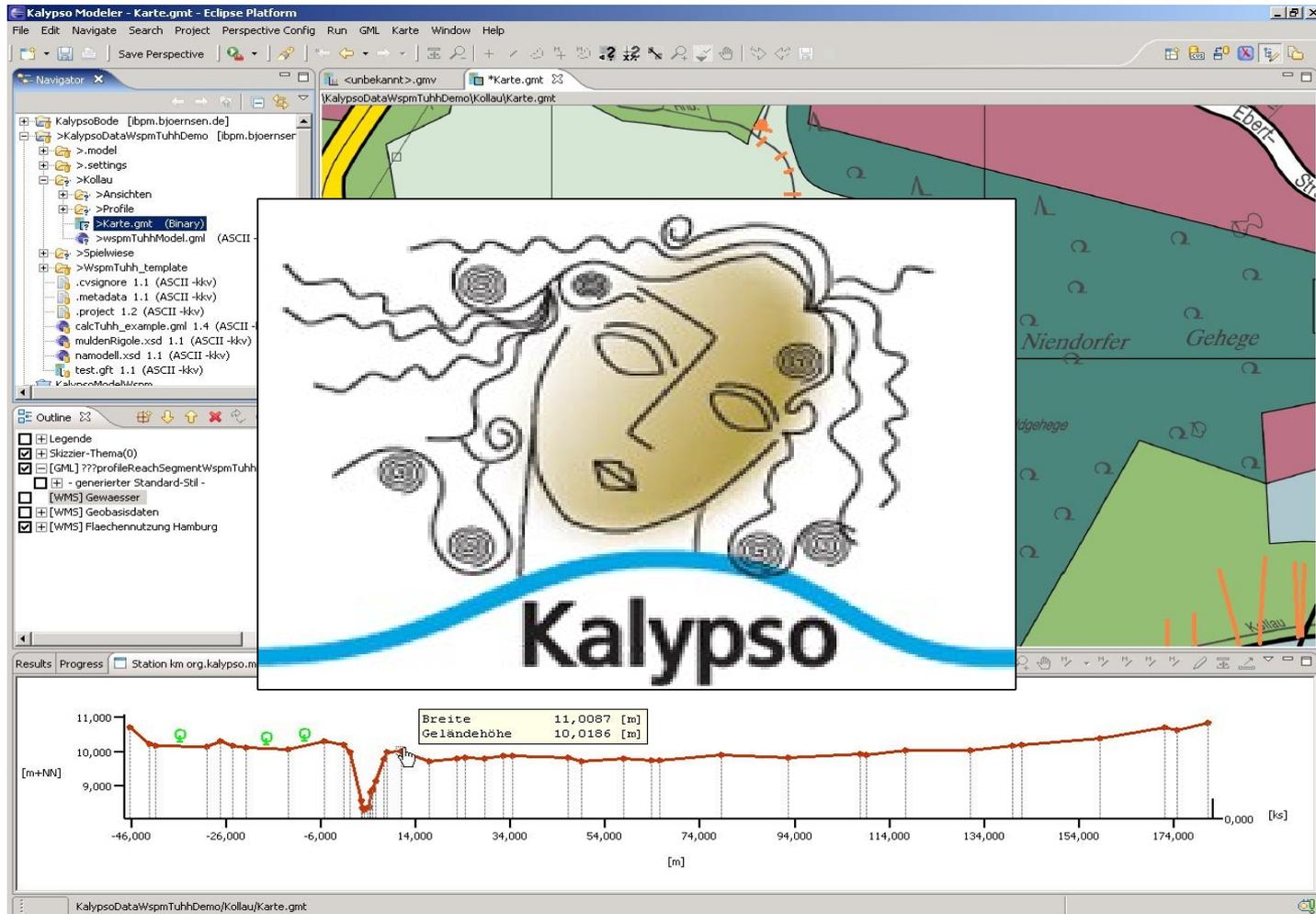


kalypso simulation platform

Gernot Belger
Andreas von Dömming
Marc Schlienger



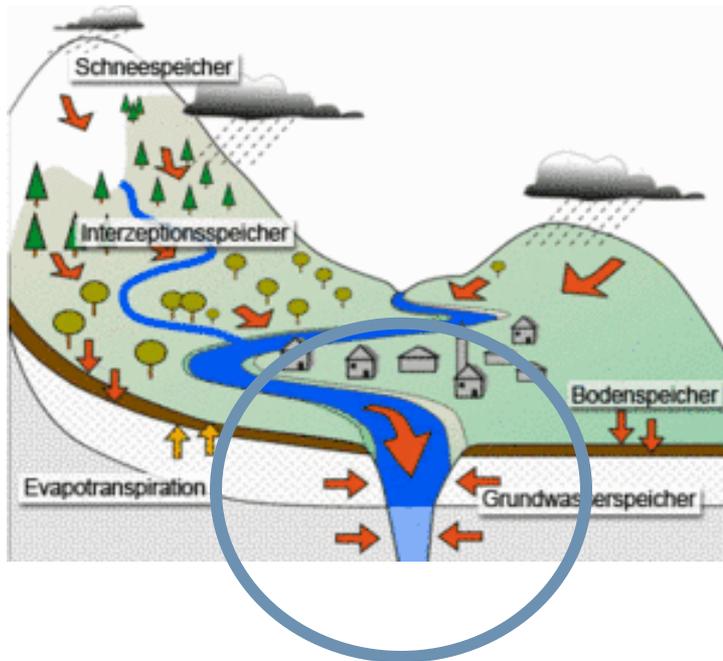
kalypso is a modelling and simulation platform for GML-based models



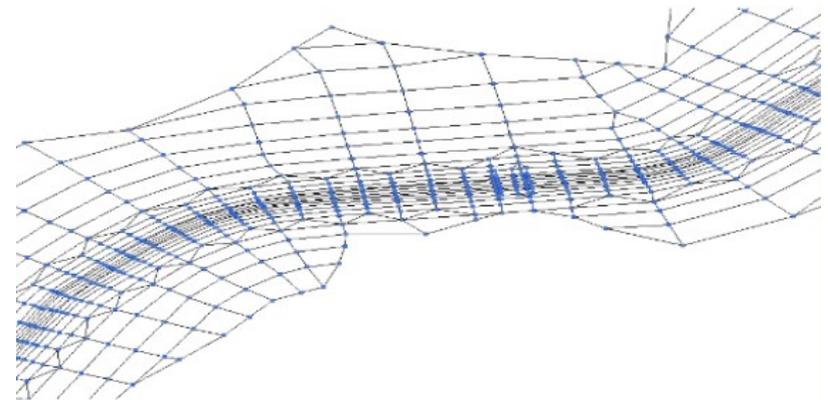


- **Motivation**
- **Introduction to Kalypso**
 - **Base Application**
 - **Customized Kalypso**
- **Modelling & GML – a generic approach**

Rainfall-Runoff-Model

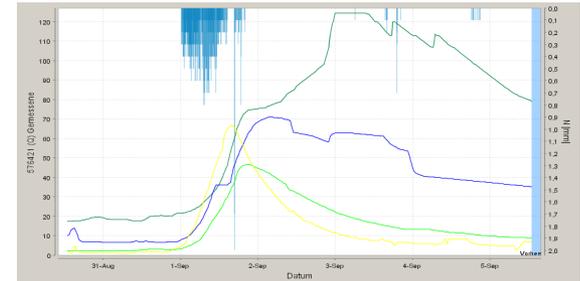
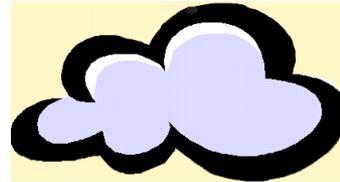
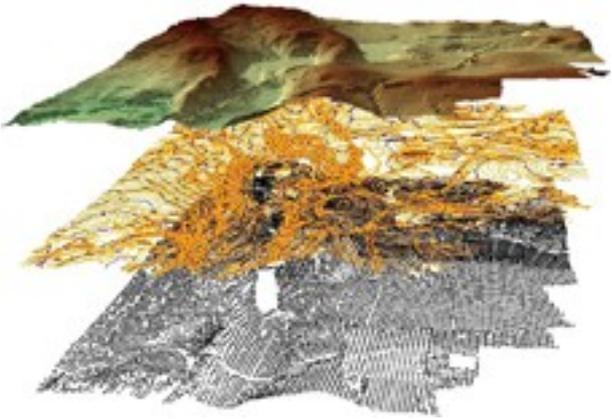


Riverflow model 2D/FEM



Water Surface Profile Model

1D/Profile



- **Terrain Model**
- **Soil Utilisation**
- **Soil Composition**

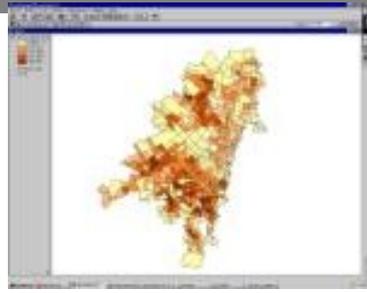
Measurements & forecasts

- **Rainfall**
- **Temperature**

- **Water Stage**
- **Influent / discharge**
- **Inundation areas**



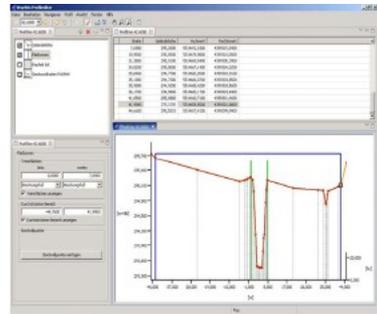
Motivation - avoid zoo of incompatible applications



```

C:\TMP\SALEC2.tmp\we_nat.geb - Viewer
File Edit Search View Convert Options Help
1800      7
1800
47666091
n C_1800.N C_1800.N 1.00
C_1800.T std.ver
we999.zf1
we_hyd
snoutyp2      1.0 1.5
1.000  2      1.0      1.0  0      10.0      5.0
15.0 10.0 6.0 1.0 1.0 1.0 0.2 0.0
11.0 7.0 10.0 1.0 1.0 1.0 1.0 0.0
      1.00 0.0      0.50      1.00      1.00
1.0 8.0 5.0 200.0 5000.0 10000.0
1
1700
1.0
0.2 4.0 1.0 0.2 0.0 0.0 0
ende gebietsdatensatz

```



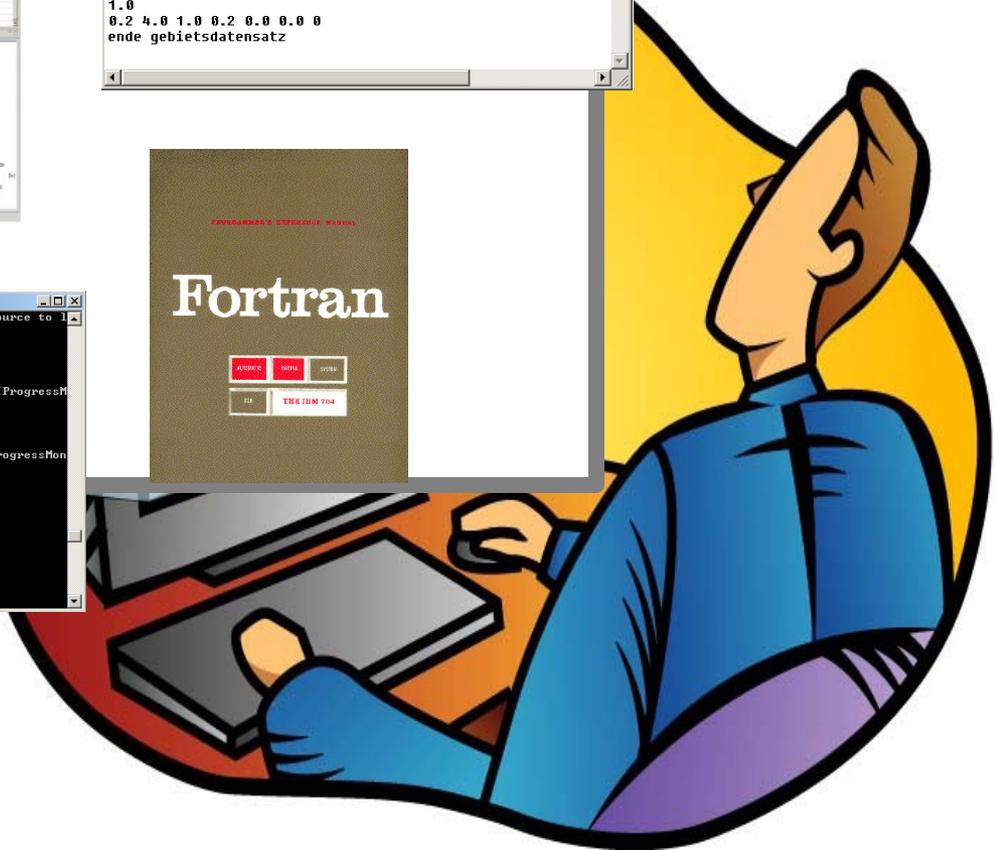
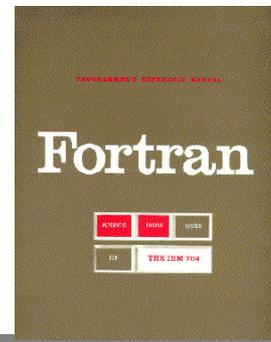
```

c:\Eingabeaufforderung
**      some context for making the relative location of the resource to l
oad absolute
** Operan monitor
**      monitors the progress of loading
** Return object
** Throws LoaderException
public Object load( final String location, final URL context, final IProgressM
onitor monitor ) throws LoaderException;

/**
** Save an object to the given location
**
public void save( final String location, final URL context, final IProgressMon
itor monitor, final Object data )
    throws LoaderException;

/**
** Release resources or whatsoever is associated to the given object
**
public void release( final Object object );
public void addLoaderListener( final ILoaderListener l );
public void removeLoaderListener( final ILoaderListener l );
}
C:\workspace\KalypsoCore\src\org\kalypso\loader>

```



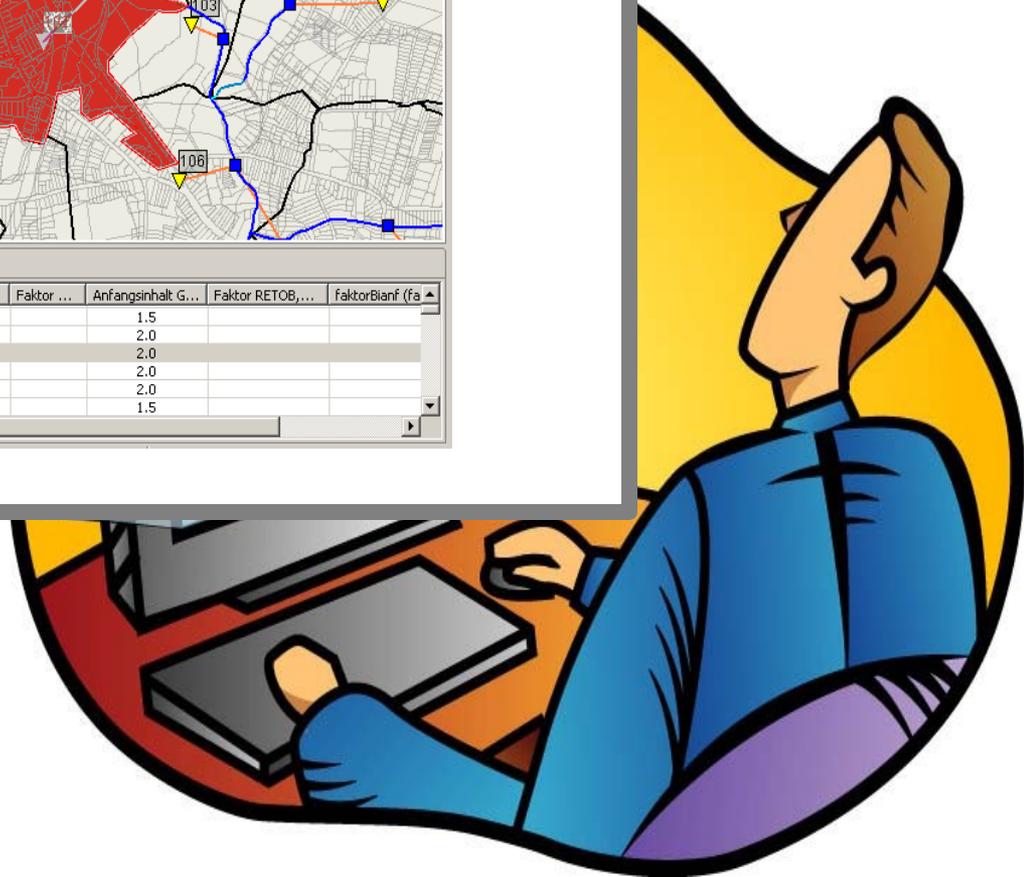


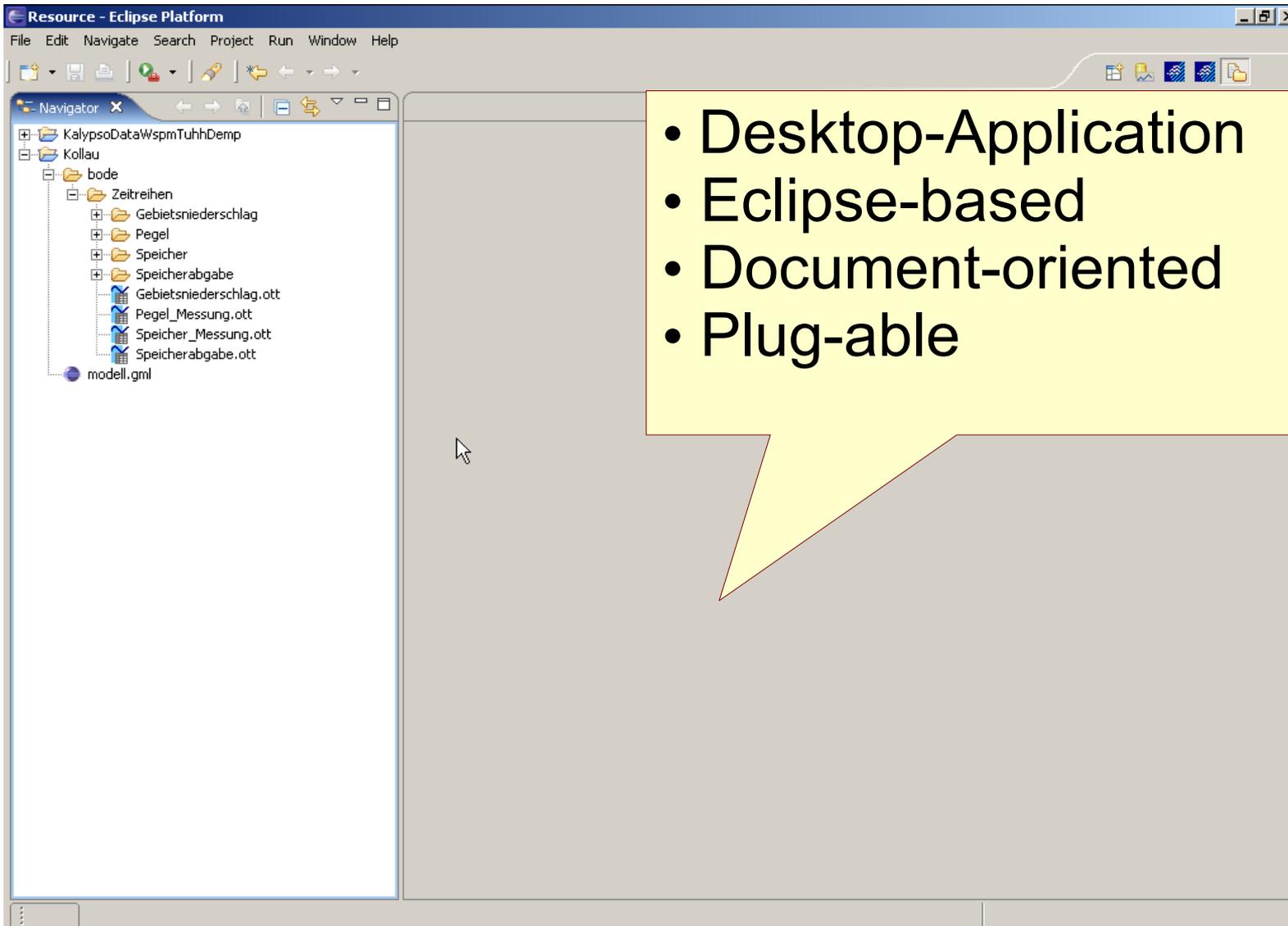
Motivation - Integration, Uniform & Consistent GUI

The screenshot displays the Kalypso Modeler software interface. The main window is titled "Hochwasser Vorhersage" and "Kalypso Modeler". The interface is divided into several panels:

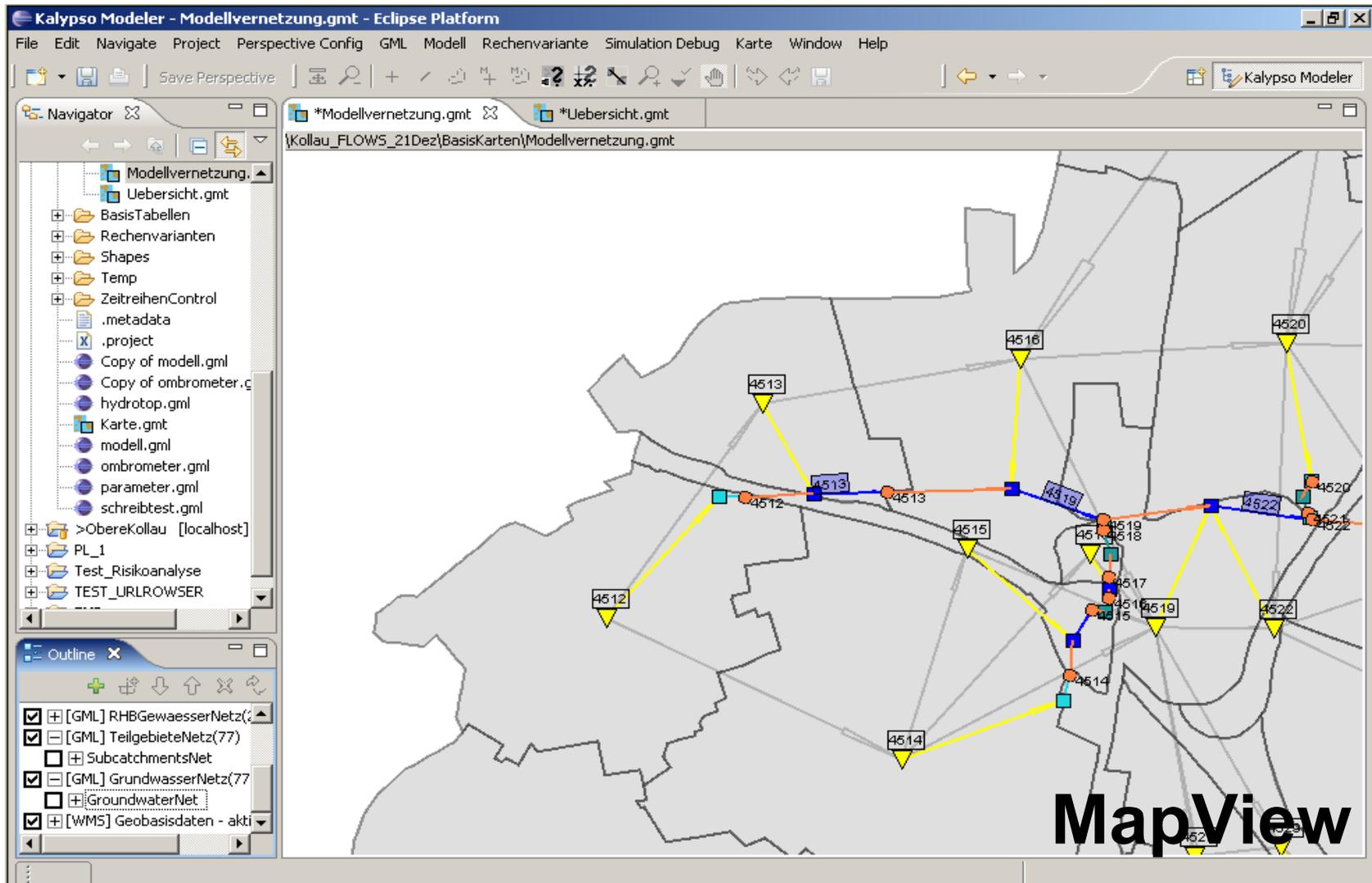
- Style Editor:** Shows settings for "Subcatchments", including "Regel:", "Subcatchments", "Titel:", "MinDenom:", "MaxDenom:", "Symbolizer:", and "Legende:".
- Navigator:** Shows a tree view of the model structure, including "CatchmentCollection1", "catchmentMember", "Catchment100", "Catchment101", "Catchment102", "bodenkorrekturmemb", "grundwasserabflussMemb", "entwaesserungsStrangMemb", "KMChannel101", "Catchment103", "Catchment104", "Catchment105", "Catchment601", "Catchment603", "Catchment604", "Catchment605", "Catchment606", "Catchment607", and "Catchment608".
- Map:** Shows a map of a city area with catchment areas highlighted in red and blue. The catchment areas are labeled with numbers 100, 101, 102, 103, 104, 105, 106, and 108.
- Table:** Shows a table with columns: "TG-Nummer (in...", "Versiegelu...", "Anstie...", "TG-Flaeche (fla...", "Faktor ...", "Anfangsinhalt G...", "Faktor RETOB,...", and "faktorBianf (fa...". The table contains data for catchment areas 100 through 105.

TG-Nummer (in...	Versiegelu...	Anstie...	TG-Flaeche (fla...	Faktor ...	Anfangsinhalt G...	Faktor RETOB,...	faktorBianf (fa...
100	0,188		1123080		1,5		
101	0,0080		123036		2,0		
102	0,22		534199		2,0		
103	0,0		203960		2,0		
104	0,077		1000499		2,0		
105	0,152		782546		1,5		





- Desktop-Application
- Eclipse-based
- Document-oriented
- Plug-able



The screenshot displays the Kalypso Modeler interface within the Eclipse Platform. The main window is titled "Kalypso Modeler - Modellvernetzung.gmt - Eclipse Platform". The menu bar includes File, Edit, Navigate, Project, Perspective Config, GML, Modell, Rechenvariante, Simulation Debug, Karte, Window, and Help. The toolbar contains various icons for file operations, navigation, and simulation control.

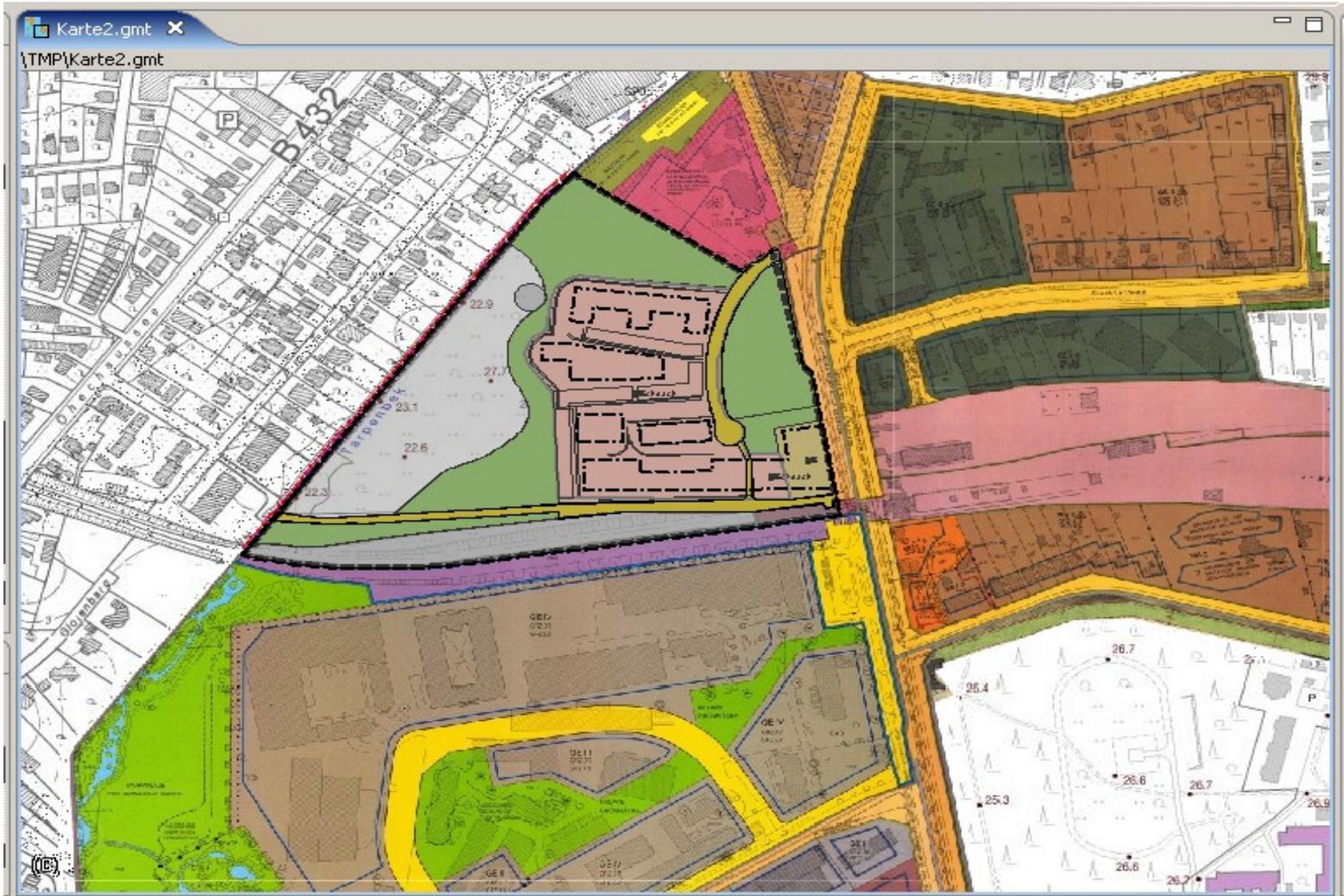
The Navigator panel on the left shows a project tree for "Modellvernetzung.gmt". The tree structure includes folders for "BasisTabellen", "Rechenvarianten", "Shapes", "Temp", and "ZeitreihenControl", along with various .gmt files and a .project file. Below the Navigator is the Outline panel, which lists several layers with checkboxes:

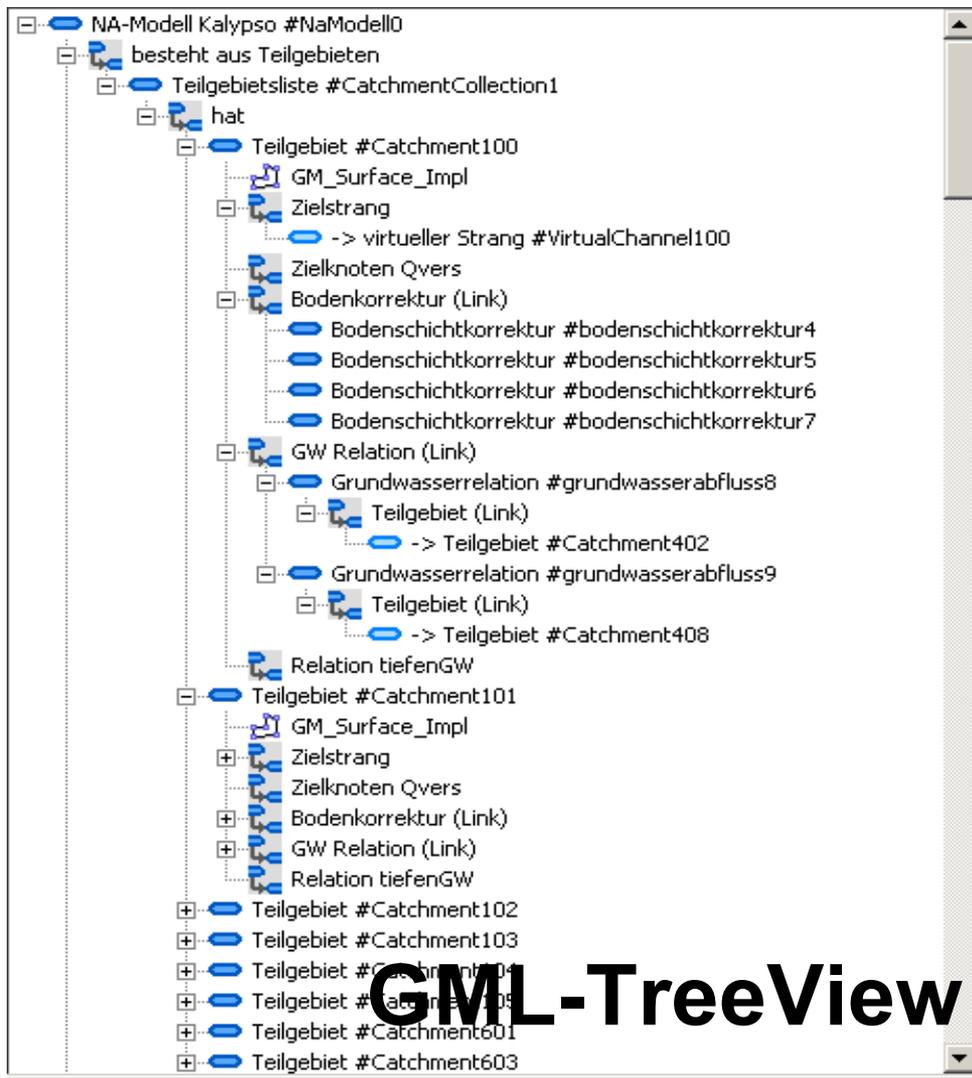
- [GML] RHBGewaesserNetz(2)
- [GML] TeilgebieteNetz(77)
- SubcatchmentsNet
- [GML] GrundwasserNetz(77)
- GroundwaterNet
- [WMS] Geobasisdaten - akti

The main Map View displays a geographical map with a network overlay. The network consists of nodes and edges. Nodes are represented by colored shapes (yellow triangles, blue squares, orange circles) and are labeled with numbers such as 4512, 4513, 4514, 4515, 4516, 4517, 4518, 4519, 4520, 4521, and 4522. Edges are represented by lines connecting these nodes, with some highlighted in yellow and others in orange. The map background shows a grey-toned geographical area with black outlines representing boundaries or roads.

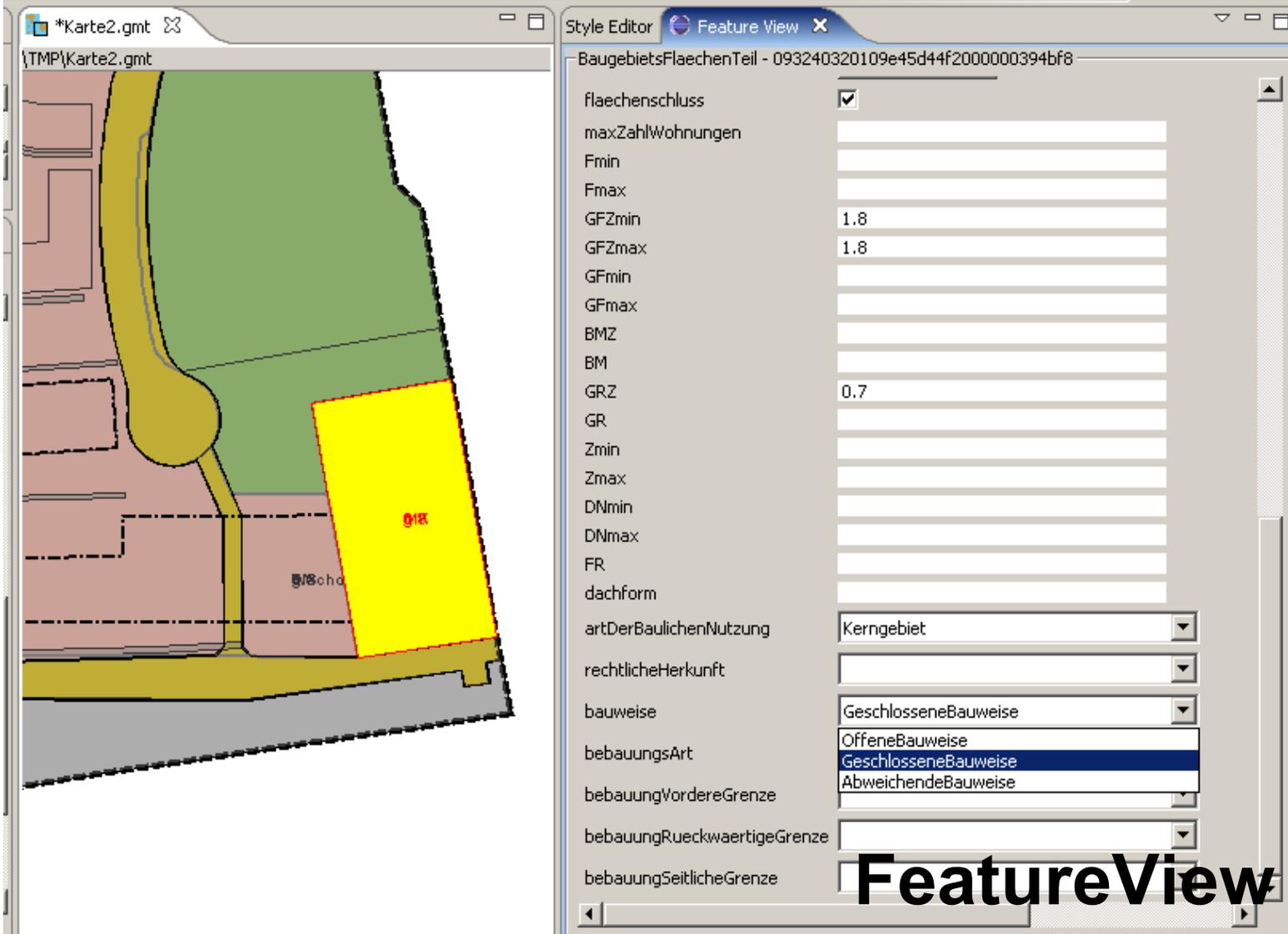
The text "MapView" is overlaid in large, bold, black font in the bottom right corner of the map area.

Local and remote (WMS) data





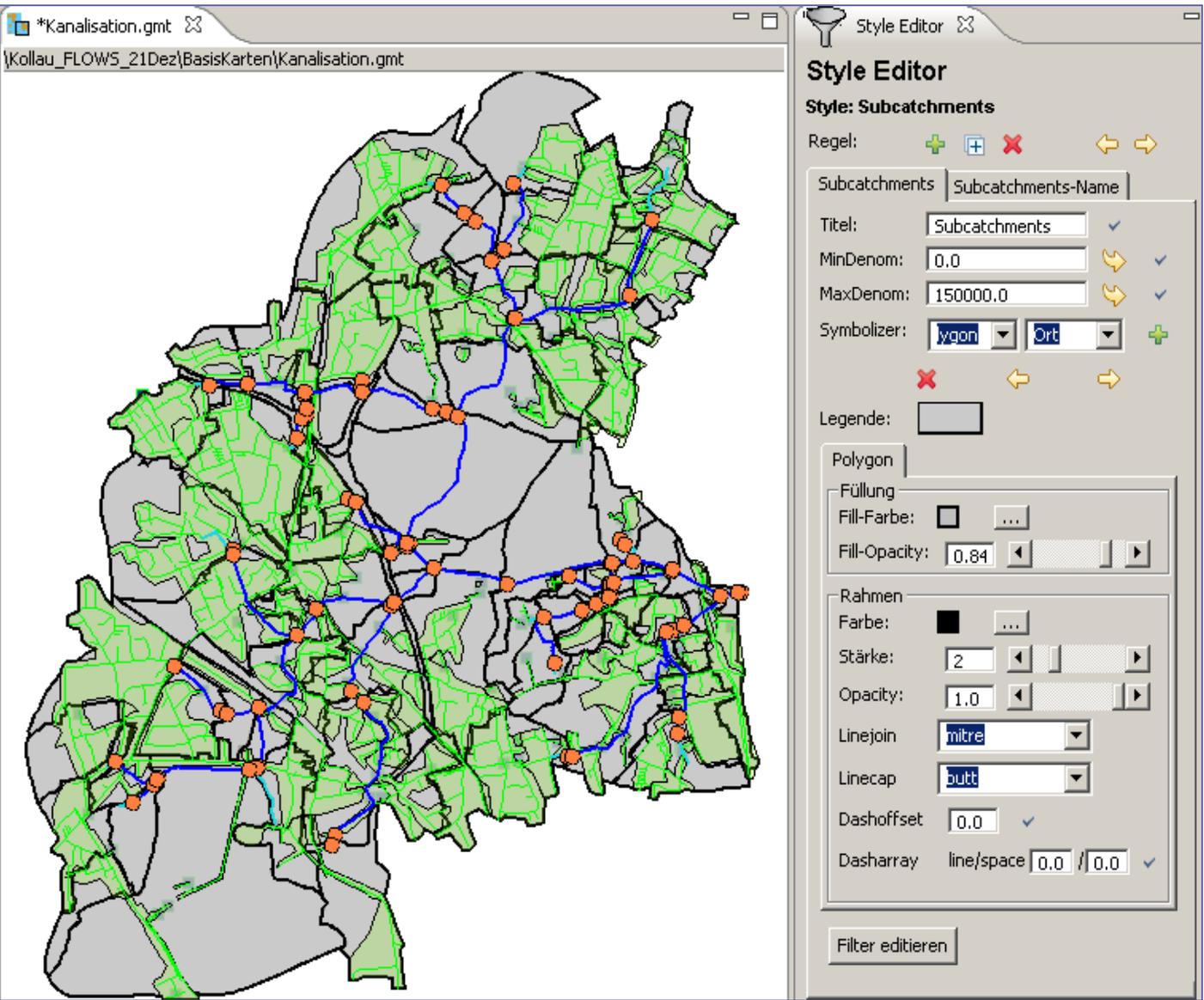
GML-TreeView



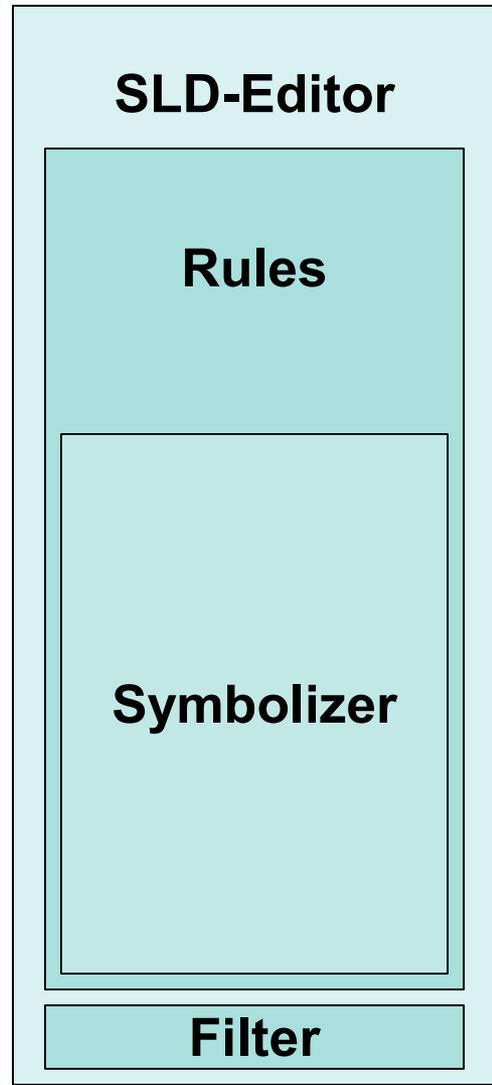
The screenshot shows a GIS application window with a map on the left and a 'Feature View' dialog box on the right. The map displays a yellow polygon with a red border and a red '018' label. The dialog box is titled 'Style Editor' and 'Feature View' and contains a list of attributes for the selected feature.

Attribute	Value
flaechenschluss	<input checked="" type="checkbox"/>
maxZahlWohnungen	
Fmin	
Fmax	
GFZmin	1.8
GFZmax	1.8
GFmin	
GFmax	
BMZ	
BM	
GRZ	0.7
GR	
Zmin	
Zmax	
DNmin	
DNmax	
FR	
dachform	
artDerBaulichenNutzung	Kerngebiet
rechtlicheHerkunft	
bauweise	GeschlosseneBauweise
bebauungsArt	OffeneBauweise GeschlosseneBauweise AbweichendeBauweise
bebauungVordereGrenze	
bebauungRueckwaertigeGrenze	
bebauungSeitlicheGrenze	

FeatureView



The screenshot displays the SLD-Editor interface. On the left, a map window titled '*Kanalisation.gmt' shows a network of subcatchments with green outlines and blue lines, overlaid on a grey background. On the right, the 'Style Editor' panel is open, showing settings for the 'Subcatchments' layer. The 'Style: Subcatchments' section includes a 'Regel:' field with a red 'X' icon, and a 'Subcatchments-Name' field with a dropdown menu set to 'Subcatchments'. Below this, 'MinDenom:' is set to '0.0' and 'MaxDenom:' is set to '150000.0'. The 'Symbolizer:' section shows a dropdown set to 'lygon' and a 'Ort' dropdown. The 'Legende:' field is empty. The 'Polygon' section includes 'Füllung' (Fill) settings: 'Fill-Farbe:' is a color swatch, and 'Fill-Opacity:' is set to '0.84'. The 'Rahmen' (Stroke) section includes 'Farbe:' (black swatch), 'Stärke:' (2), 'Opacity:' (1.0), 'Linejoin:' (mitre), 'Linecap:' (butt), 'Dashoffset:' (0.0), and 'Dasharray:' (line/space 0.0 / 0.0). A 'Filter editieren' button is at the bottom.





Timeseries Browser

Kalypso Zeitreihenbrowser - <unbekannt>.gmv - Eclipse Platform

File Edit Navigate Search Project Run Baum Window Help

Zeitreihenbrowser

- Ergebnisse
- Niederschlag
- Ombrometer
- Pegel
 - CVS
 - Pegel_Node1001..
 - Pegel_Node1020..**
 - Pegel_Node1110..
 - Pegel_Node1210..
 - Pegel_Node1220..
 - Pegel_Node1300..
 - Pegel_Node1401..
 - Pegel_Node1600..
 - Pegel_Node1700..
 - Pegel_Node1800..
 - Pegel_Node2002..
 - Pegel_Node3100..
 - Pegel_Node3201..
 - Pegel_Node4100..
 - Pegel_Node4200..
 - Pegel_Node7200..
 - Pegel_Node7300..
- Zufluss
- .settings

Properties

Property	Value
Alarmstufe 1	170.0
Alarmstufe 2	190.0
Alarmstufe 3	330.0
Alarmstufe 4	510.0000000000000006
Beschreibung	Kleindalzig
Fluss	
Flussgebiet	Weißer Elster
Hochwert	0.0

Diagramm-QuickView

14.11.2003 15:23:32 - 10.08.2006 15:23:32

Abfluss [m³/s]

Wasserstand 576631 [cm]

Vorhers

Alarmstufe 2

Alarmstufe 1

Datum

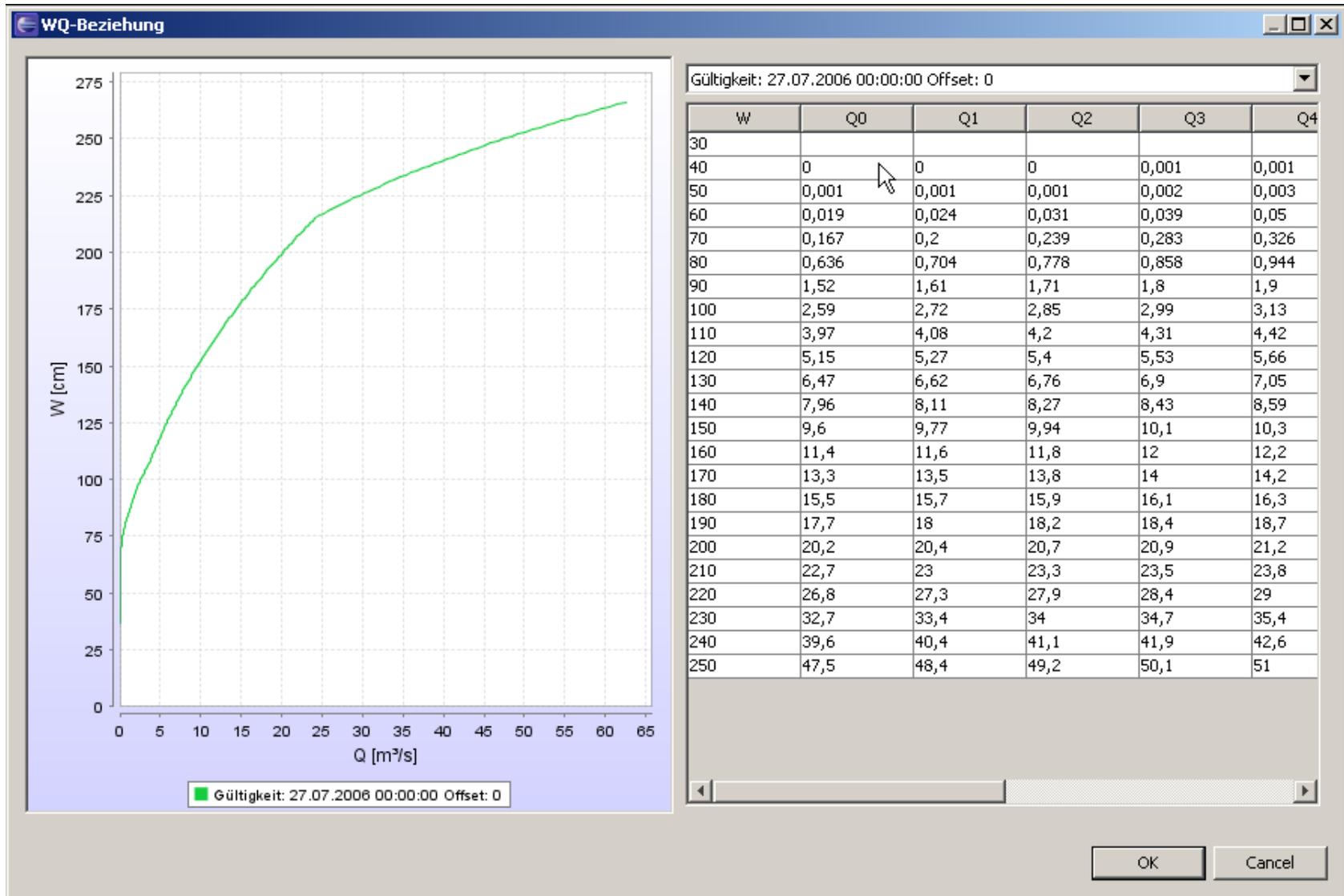
W - 576631 Q - 576631

Tabellen-QuickView

Datum	Q - 576631	W - 576631
01.01.2005 10:00:00	22,396	91,00
01.01.2005 11:00:00	22,396	91,00
01.01.2005 12:00:00	22,396	91,00
01.01.2005 13:00:00	22,396	91,00
01.01.2005 14:00:00	22,396	91,00
01.01.2005 15:00:00	22,396	91,00
01.01.2005 16:00:00	22,396	91,00
01.01.2005 17:00:00	22,396	91,00
01.01.2005 18:00:00	22,396	91,00
01.01.2005 19:00:00	22,396	91,00
01.01.2005 20:00:00	22,396	91,00
01.01.2005 21:00:00	22,790	92,00
01.01.2005 22:00:00	22,790	92,00
01.01.2005 23:00:00	22,790	92,00
02.01.2005 00:00:00	22,790	92,00
02.01.2005 01:00:00	23,188	93,00
02.01.2005 02:00:00	23,188	93,00
02.01.2005 03:00:00	23,188	93,00
02.01.2005 04:00:00	23,188	93,00
02.01.2005 05:00:00	27,376	103,00
02.01.2005 06:00:00	28,260	105,00
02.01.2005 07:00:00	28,708	106,00
02.01.2005 08:00:00	29,160	107,00
02.01.2005 09:00:00	30,076	109,00
02.01.2005 10:00:00	30,076	109,00
02.01.2005 11:00:00	31,008	111,00
02.01.2005 12:00:00	32,435	114,00
02.01.2005 13:00:00	32,919	115,00
02.01.2005 14:00:00	32,919	115,00
02.01.2005 15:00:00	34,894	119,00
02.01.2005 16:00:00	35,905	121,00
02.01.2005 17:00:00	35,398	120,00
02.01.2005 18:00:00	35,398	120,00
02.01.2005 19:00:00	35,398	120,00
02.01.2005 20:00:00	35,398	120,00
02.01.2005 21:00:00	35,398	120,00
02.01.2005 22:00:00	35,398	120,00
02.01.2005 23:00:00	35,398	121,00

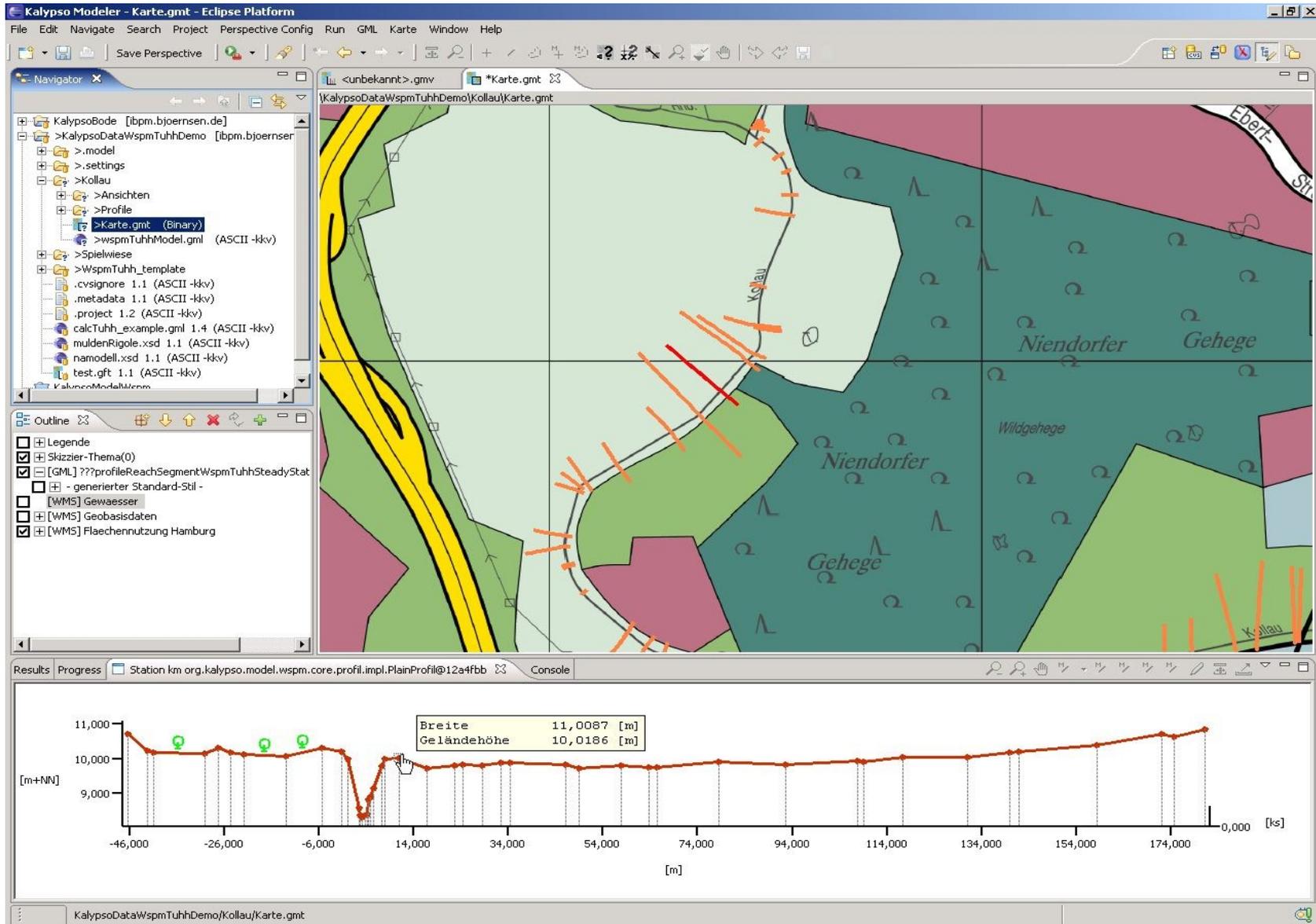


Dedicated Views





Dedicated view – profile editor

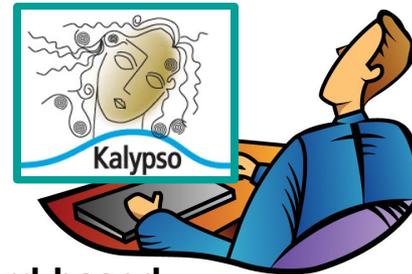




Wizard and Expert Perspectives

Kalypso-Workflow

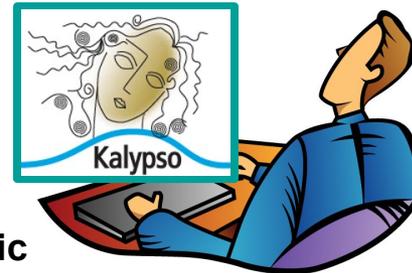
for specific Users
pre-configured



Wizard-based

Kalypso-Base

Views and Data-Management
(GML2, GML3.1 ,O&M ,SWE)
strong type-based API
for GML-Application-Schema



Basic
Application

Services

(WMS, WFS, Observations, Simulation)
SOS in development
WPS in consideration



Flood Forecast

Hochwasser Vorhersage - Eclipse Platform

File Edit Navigate Project Gis Tools Window Help

Hochwasser Vorhersage für KalypsoWeisseElster

Prognose Pegel Adorf 2/17

Elstermühlau
Rodewisch
Strassberg
Oelmitz
Adorf
Bad Elster

Adorf

Parameter Umhüllende
Vorhersagegenauigkeit 5
Differenzausgleich Start Vorhersagespur
Differenzausgleich Ende Vorhersagespur

Optimierung
optimieren
Parameter Gewaesser
Faktor k 1,269
Faktor n 0,809

Parameter Gebiete
Faktor Niederschlag 1,402
Bodenfeuchte 1,158
Retention 1,25
Grundwasserstand 1,732

Abfluss [m³/s]

Datum

Adorf - Abfluss - berechnet (red)
Adorf - Abfluss - gemessen (blue)

Datum	Abfluss [m³/s] (gemessen)	Abfluss [m³/s] (berechnet)
29-Aug	2.0	2.0
30-Aug	1.5	1.5
31-Aug	1.5	1.5
1-Sep	1.5	1.5
2-Sep	15.0	15.0
3-Sep	6.0	6.0
4-Sep	4.0	4.0
5-Sep	3.0	3.0
6-Sep	3.0	3.0
7-Sep	3.0	3.0
8-Sep	3.0	3.0
9-Sep	3.0	3.0
10-Sep	3.0	3.0

Diagrammanzeige: Abfluss Wasserstand

Berechnung durchführen

< Back Next > Beenden

InformDSS Manager - INFORM.DSS

Window Help

INFORM.DSS Manager x

[Zurück zur Startseite](#)

Projekt: EmmericherWarth
Variante: V01_BU03_HB02 - Buhngengruppe

▶ Projekte ?

▶ Projektdaten ?

▶ Varianten ?

▼ Maßnahmen ?

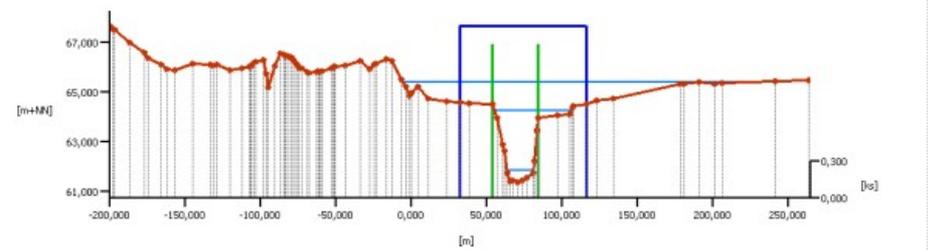
Hier können die Maßnahmen der aktiven Variante bearbeitet werden.
 neue Maßnahme anlegen:

-  [Auengehölze](#) 
-  [Bauwerk](#)
-  [Buhne](#)
-  [Deichverlegung](#)
-  [Parallelwerk](#) 
-  [Sohlaufhöhung](#) 
-  [Sohleintiefung](#)
-  [Uferabgrabung](#) 
-  [Uferanschüttung](#)
-  [Vorlandabgrabung](#)
-  [Vorlandaufhöhung](#)

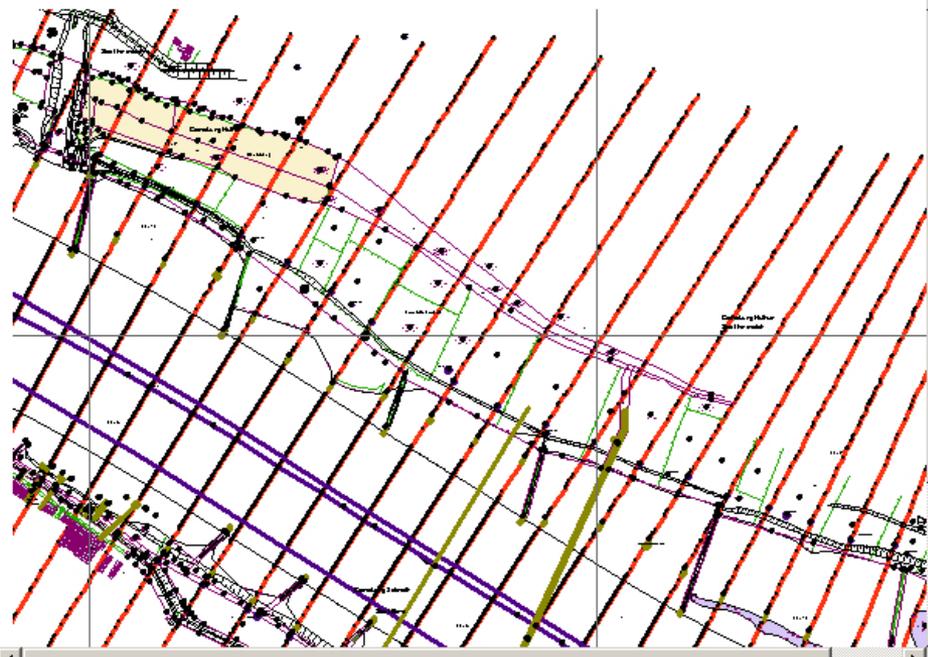
 [Maßnahme editieren](#)

 [Maßnahme löschen](#)

massnahmenProfil.jpg



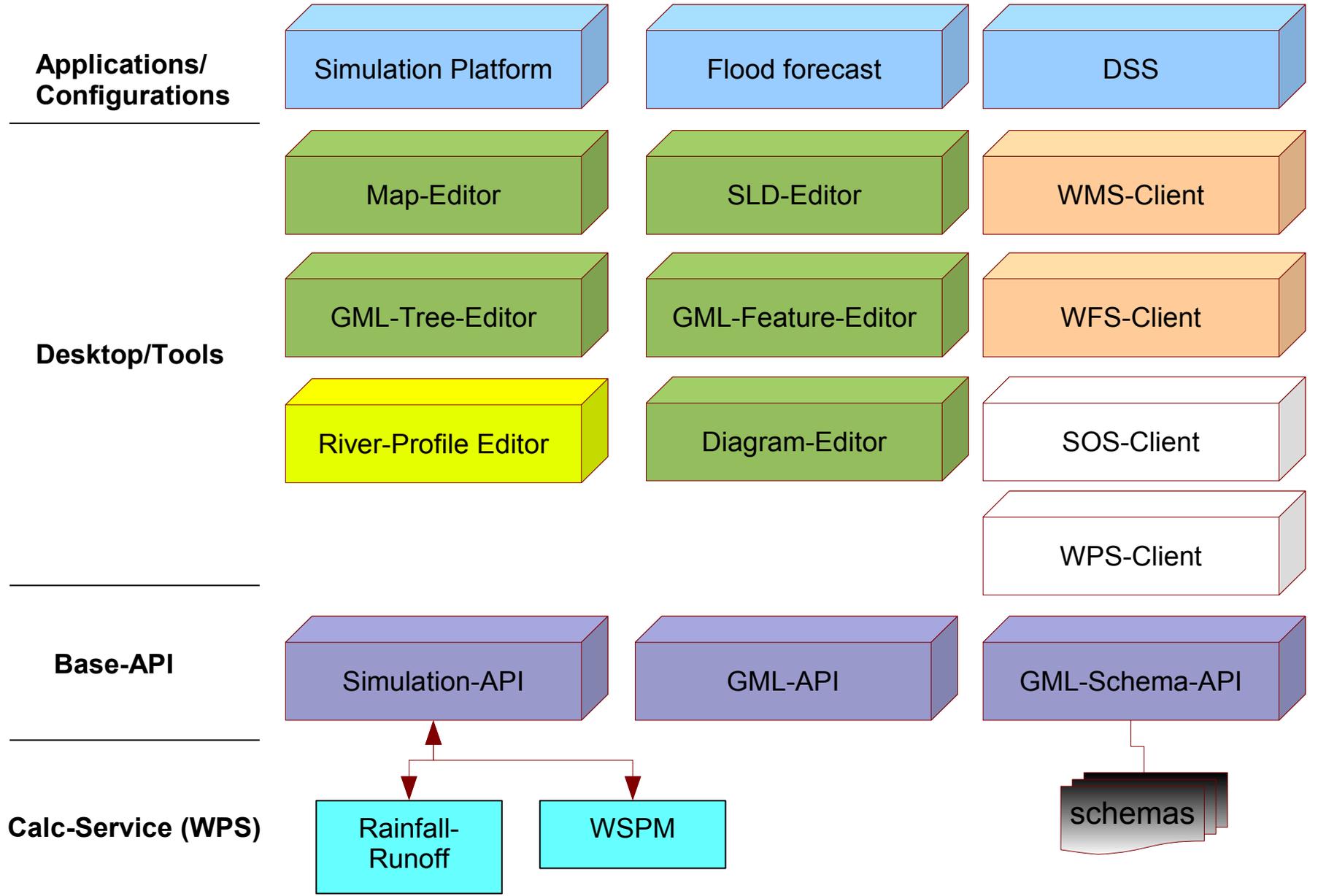
InfoBrowserView





Kalypso

API Components





Modelling & GML: Kalypso inside

Defines simulation model

Used to generate dialogs and views in a generic way

```
<element name="slope_land" default="100" nillable="false">
  <annotation>
    <documentation>
      <document...
    </documentation>
  </annotation>
  <simpleContent base="int" use="total" value="100"/>
  <restriction base="int" value="0"/>
  </restriction>
</simpleType>
</element>
```

Application Schemas

Only thing Kalypso knows about a model

Used to validate model data



Complex schema dependencies

```
<?xml version="1.0" encoding="UTF-8"?>
<schema targetNamespace="org.kalypso.model.wspm.tuhh"
xmlns:tuhh="org.kalypso.model.wspm.tuhh"
xmlns:wspm="org.kalypso.model.wspm"
xmlns:wspmcommon="org.kalypso.model.wspmcommon"
xmlns:runoff="org.kalypso.model.wspmrunoff"
xmlns:gml="http://www.opengis.net/gml"
xmlns:om="http://www.opengis.net/om"
xmlns="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified" vers
```

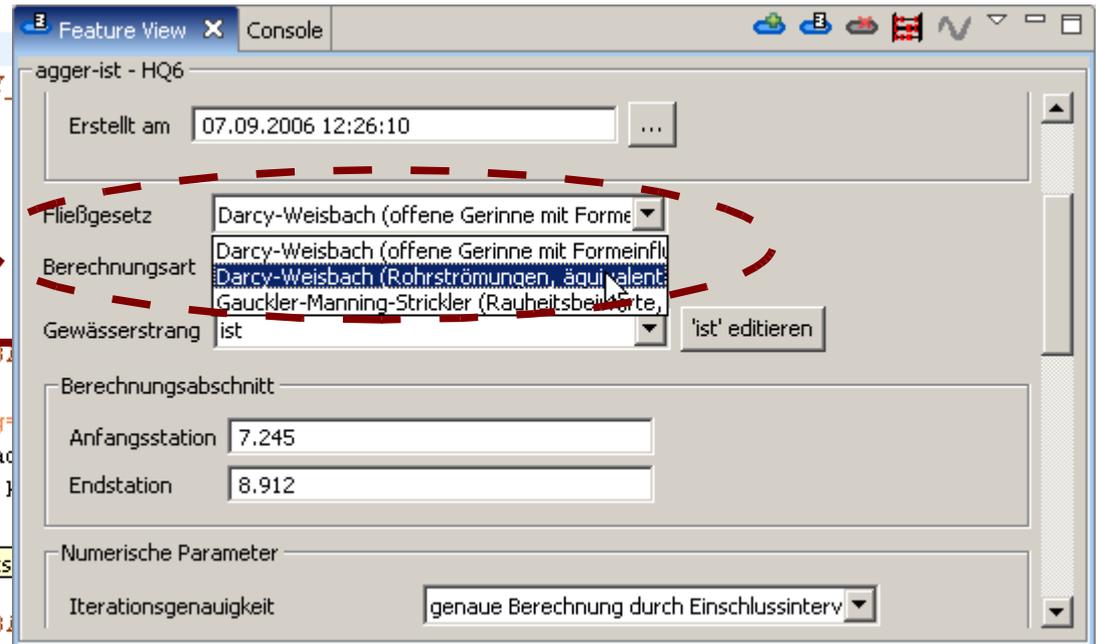
Resolving namespaces

- Schema from local cache
- Schema from catalogue
- Schema via location



Enumerations

```
<element name="fliessgesetz" default="DARCY"  
  <annotation>  
    <documentation xml:lang="de">  
      <label>Fließgesetz</label>  
    </documentation>  
  </annotation>  
</simpleType>  
<restriction base="string">  
  <enumeration value="DARCY_WEISBACH">  
    <annotation>  
      <documentation xml:lang="de">  
        <label>Darcy-Weisbach (offene Gerinne mit Formeinfluss,  
          Sandrauheiten, ks)</label>  
      </documentation>  
    </annotation>  
  </enumeration>  
  <enumeration value="DARCY_WEISBACH">  
    <annotation>  
      <documentation xml:lang="de">  
        <label>Darcy-Weisbach (offene Gerinne mit Formeinfluss,  
          äquivalente Sandrauheiten, ks)</label>  
      </documentation>  
    </annotation>  
  </enumeration>  
  <enumeration value="MANNING_STRICKLER">  
    <annotation>  
      <documentation xml:lang="de">  
        <label>Gauckler-Manning-Strickler (Rauheitsbeiwerte,  
          kst)</label>  
      </documentation>  
    </annotation>  
  </enumeration>  
</restriction>
```





Rule based Validation

```
<element name="slope_land" default="100" nillable="false">
  <annotation>
    <documentation xml:lang="de">
      <label>Rückenneigung [1:x] </label>
      <tooltip>Die Neigung zur Landseite.</tooltip>
      <description>...</description>
    </documentation>
  </annotation>
  <simpleType>
    <restriction base="integer">
      <minExclusive value="0"/>
    </restriction>
  </simpleType>
</element>
```

Field	Value	Validation Status
Bezeichnung	<Bezeichnung>	✓
Die Lage der Bühne	<nicht editierbar>	✗
Uferseite	linkes Ufer	✓
Höhe Bühnenkopf [mNN]	100.0	✓
Rückenneigung [1:x]	-100	✗
Kopfneigung [1:x]	5	✓

Einzelbühne - <Bezeichnung>

INFORM.DSS Maßnahmen

Maßnahmen

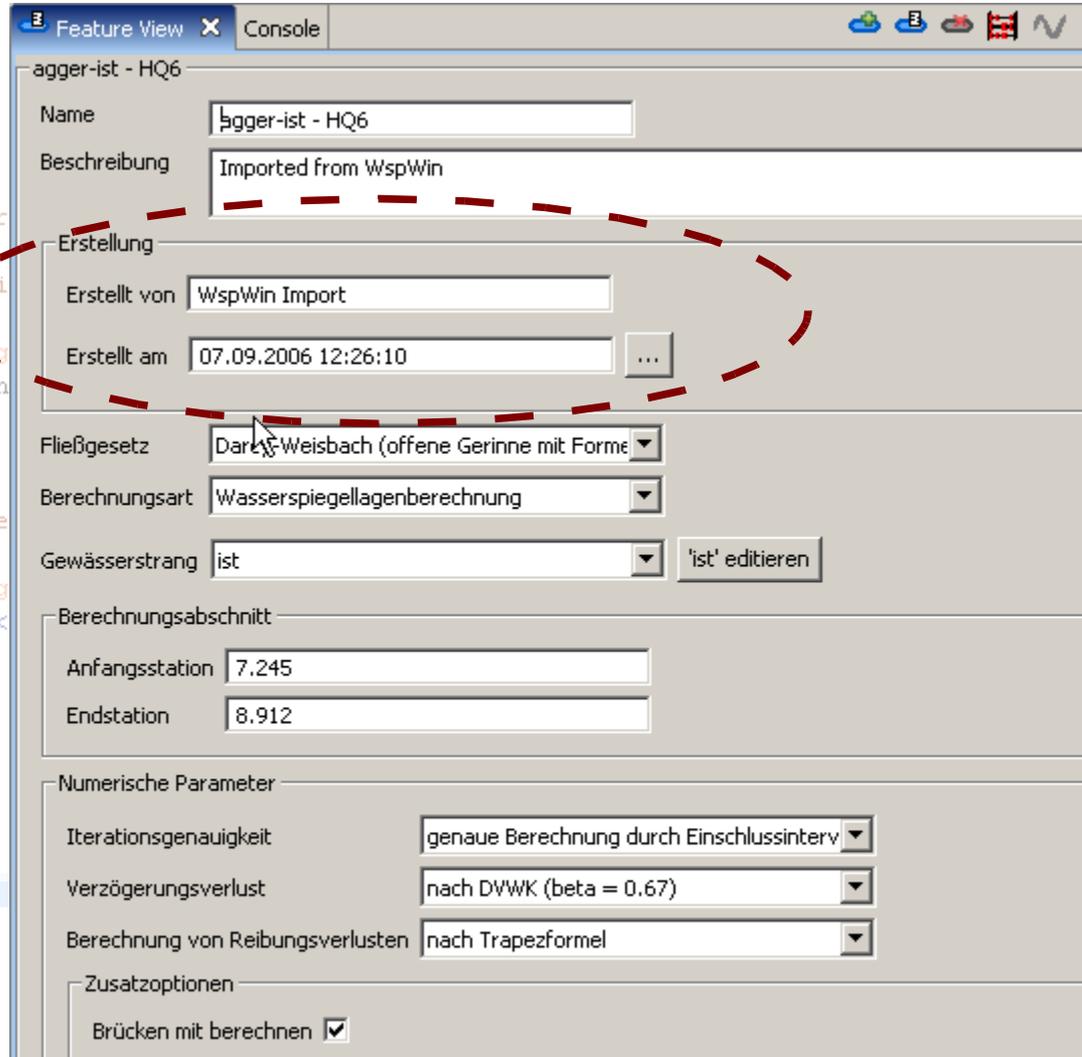
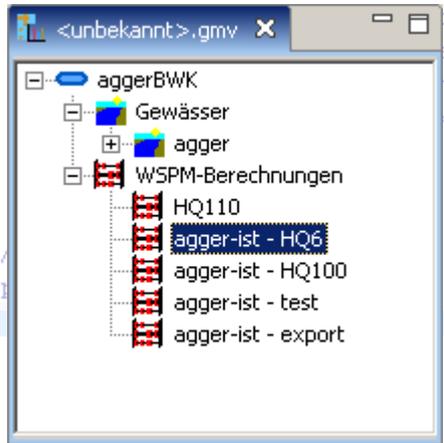
Einzelbühne - <Bezeichnung>

Wert muss größer 0,0 sein.



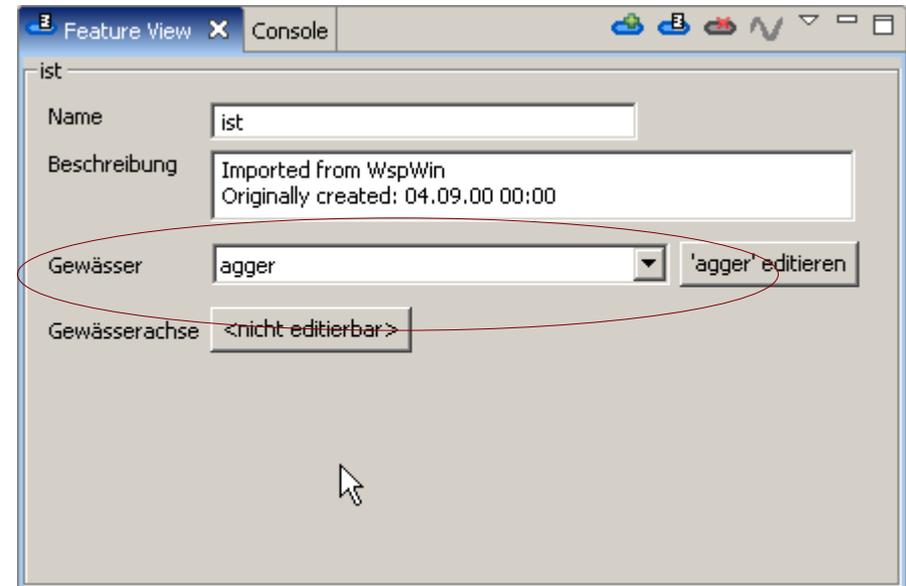
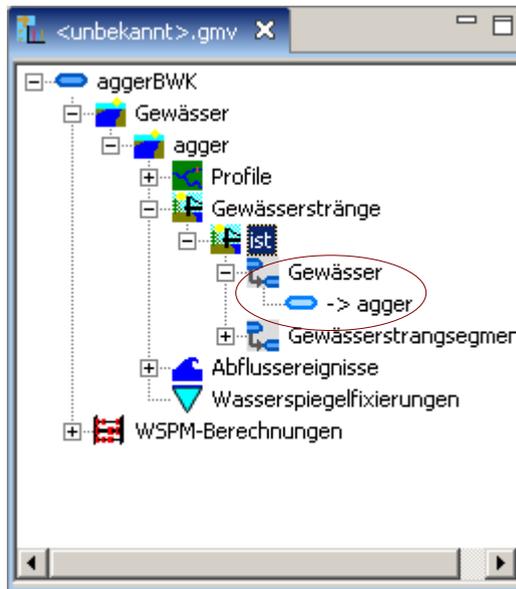
Inlined Features

```
<complexType name="calcCreationInlinePropertyType">  
  <sequence minOccurs="1" maxOccurs="1">  
    <element ref="wspm:CalcCreation"/>  
  </sequence>  
</complexType>  
<complexType name="calcCreationType">  
  <complexContent>  
    <extension base="wspmcommon:EmptyFeature">  
      <sequence>  
        <element name="user" type="string">  
          <annotation>  
            <documentation xml:lang="de">  
              <label>Erstellt von</label>  
            </documentation>  
          </annotation>  
        </element>  
        <element name="date" type="date">  
          <annotation>  
            <documentation xml:lang="de">  
              <label>Erstellt am</label>  
            </documentation>  
          </annotation>  
        </element>  
      </sequence>  
    </extension>  
  </complexContent>  
</complexType>
```



Linked Feature

```
<complexType name="WaterBodyLinkPropertyType">  
  <sequence minOccurs="0" maxOccurs="0">  
    <element ref="wspm:WaterBody"/>  
  </sequence>  
  <attributeGroup ref="gml:AssociationAttributeGroup"/>  
</complexType>
```





supported

- **GML2 and GML3 at the same time**
- **distributed Application Schemas (include, import, substitutions)**
- **complex Features (deep hierarchy, xlink)**
- **observations (O&M) (tuple-based)**

under development

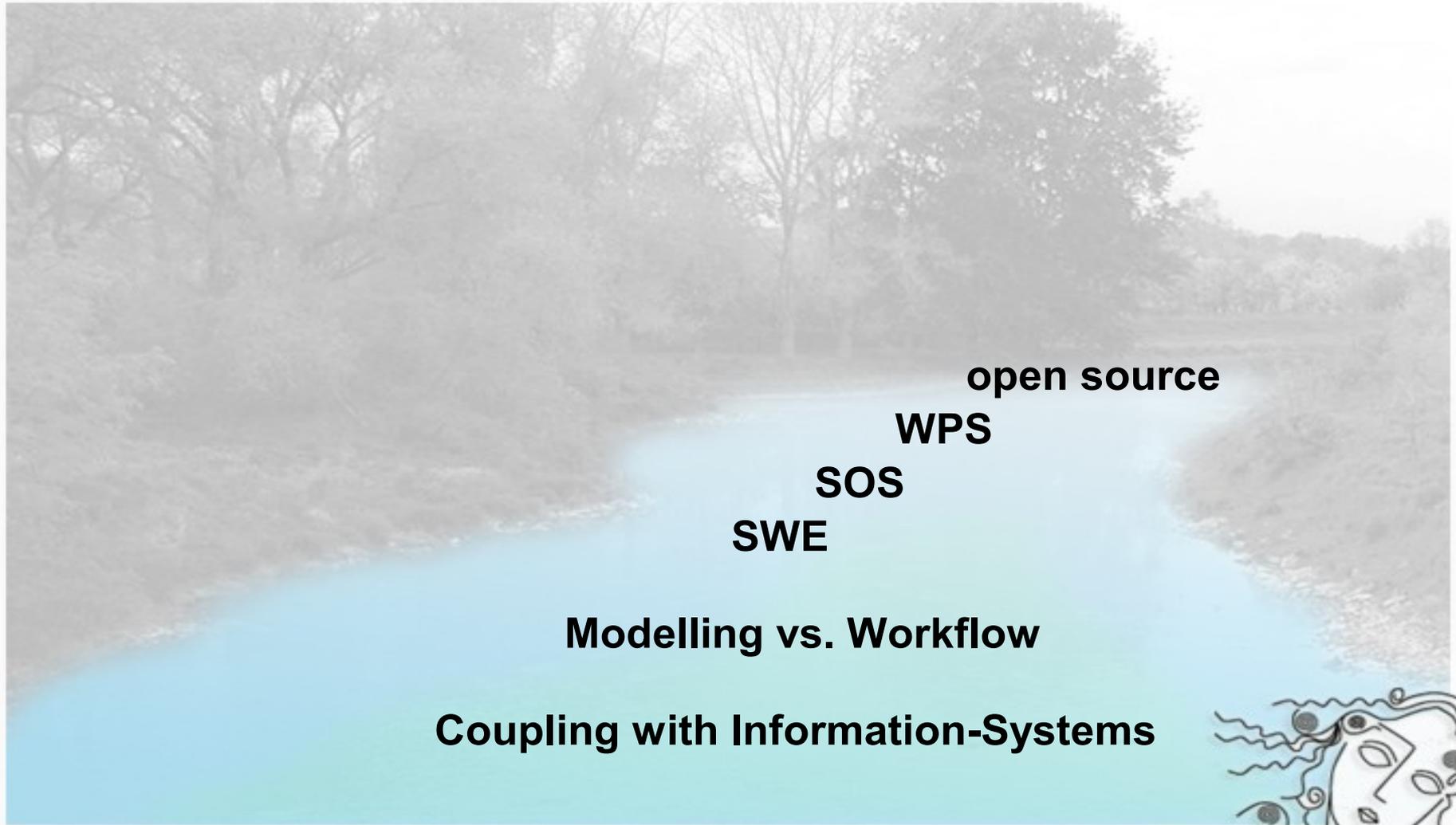
- **external xlink (user editable)**
- **GridCoverage**

not supported

- **new GML3 geometries**
- **choice (only rudimentary)**
- **schema cyclic dependencies**



Future – Kalypso, where do you flow ?



open source

WPS

SOS

SWE

Modelling vs. Workflow

Coupling with Information-Systems





Thank you for attending!



<http://www.kalypso-simulation-platform.org>

Welcome to Kalypso !

Projects hosted on this site are related to the concepts and design of Kalypso. The major project on this site is **kalypso** itself.

If you have questions referring to kalypso (architecture, installation, ...whatever), you are welcome to subscribe to our mailinglist [kalypso-devel](#).

Founding organizations

- **TUHH**
Hamburg, University of Technology - Institute of River and Coastal Engineering, Germany
- **BCE**
Koblenz, Bjoernsen Consulting Engineers, Germany

Letzte Neuigkeiten

kalypso at deegree4 2006
Andreas von Doemming - 2006-05-31 12:54 - Kalypso
Kalypso takes part on deegree4, June 8th, 2006 at the Department of Geography at University Bonn. Deegree4 is a get-together of users and developers of the open source project deegree. We will contribute a presentation of "Integration von deegree in KALYPSSO".
(0 Comment) [\[Weiterlesen/Kommentieren\]](#)

Kalini-Milukov
Andreas von Doemming - 2006-03-06 09:56 - KalypsoRIM
A new plugin has been commited: KalypsoRIM. It is a graphical user interface for importing Kalini-Milukov-parameters from 1D-simulation results. It uses the module KalypsoIM which is also quite new, that does the calculation of these parameters.
(0 Comment) [\[Weiterlesen/Kommentieren\]](#)

GForge Statistiken
Registrierte Projekte: 13
Registrierte Benutzer: 17

Populärste Downloads (nach Projekten)
(29) Kalypso
(14) Test-ov2
(7) KalypsoDevelop
(1) KalypsoBeardBorlingFramework
[Mehr]

Am höchsten eingestufte Benutzer
Keine Statistiken verfügbar

Aktivierte Projekte in dieser Woche
(100.0%) KalypsoBase
(82.3%) KalypsoWaterSurfaceProfileModel
(66.7%) KalypsoGMLBase
(50.0%) KalypsoContribulans
(33.3%) Kalypso
(16.7%) KalypsoSimulation
[Mehr]

Neu registrierte Projekte:
(05/14) KalypsoWaterSurfaceProfileModel
(02/14) KalypsoSimulation
(02/14) KalypsoRIM





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