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

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

Motivation - Models in Hydraulic Engineering

Rainfall-Runoff-Model

Riverflow model
2D/FEM

Water Surface Profile Model
1D/Profile
Motivation - handling of model data

- Terrain Model
- Soil Utilisation
- Soil Composition
- Measurements & forecasts
  - Rainfall
  - Temperature
- Water Stage
- Influent / discharge
- Inundation areas

Motivation - avoid zoo of incompatible applications
Motivation - Integration, Uniform & Consistent GUI

Base Application

• Desktop-Application
• Eclipse-based
• Document-oriented
• Plug-able
Map View

Local and remote (WMS) data
Generic FeatureView

SLD-Editor

Rules
Symbolizer
Filter
Timeseries Browser

Dedicated Views
Dedicated view – profile editor

Wizard and Expert Perspectives

Kalypso-Workflow
for specific Users
pre-configurated

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

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

Decision Support Systems
API Components

Applications/Configurations
- Simulation Platform
- Flood forecast
- DSS
- WFS-Client
- WMS-Client
- SLD-Editor
- Map-Editor
- GML-API
- GML-Feature-Editor
- WPS-Client
- WFS-Client
- SOS-Client
- WPS-Client
- River-Profile Editor
- Diagram-Editor
- GML-Tree-Editor
- GML-Feature-Editor
- GML-Schema-API
- Simulation-API
- Rainfall-Runoff
- WSPM

Desktop/Tools
- SLD-Editor
- Map-Editor
- GML-API
- GML-Feature-Editor
- WPS-Client
- WFS-Client
- SOS-Client
- WPS-Client
- River-Profile Editor
- Diagram-Editor
- GML-Tree-Editor
- GML-Feature-Editor
- GML-Schema-API
- Simulation-API
- Rainfall-Runoff
- WSPM

Base-API
- Simulation-API
- Rainfall-Runoff
- WSPM

Calc-Service (WPS)
- Rainfall-Runoff
- WSPM

Modelling & GML: Kalypso inside

Defines simulation model

Used to generate dialogs and views in a generic way

Application Schemas

Used to validate model data

Only thing Kalypso knows about a model
Complex schema dependencies

```xml
<?xml version="1.0" encoding="UTF-8"?>
<schema xmlns:tuhk="org.kalypso.model.wspw.tuhk"
        xmlns:wspw="org.kalypso.model.wspw.tuhk"
        xmlns:wspwcommon="org.kalypso.model.wspwcommon"
        xmlns:runoff="org.kalypso.model.wspwrunoff"
        xmlns:gmml="http://www.opengis.net/gml"
        xmlns:com="http://www.opengis.net/om"
        xmlns="http://www.w3.org/2001/XMLSchema"
        elementFormDefault="qualified"
        targetNamespace="org."
        schemaLocation="schema.xsd">

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

Enumerations
```

```xml
<element name="flussgeometrie" default="DAECHER">
  <annotation>
    <documentation xml:lang="de">
      <label>Flussgeometrie</label>
    </documentation>
  </annotation>
</element>
```
Rule based Validation

```xml
<element name="slope_land" default="100" nillable="false">
  <annotation>
    <documentation xml:lang="de">
      <label>Rückeneigung [1:x]</label>
      <tooltip>Die Neigung zur Landseite.</tooltip>
    </description>
  </documentation>
</element>
```

GML Support via generic approach

Inlined Features

```xml
<complexType name="calcCreationInlinePropertyType">
  <sequence minOccurs="1" maxOccurs="1">
    <element ref="calc:CalcCreation"/>
  </sequence>
</complexType>
```
GML Support via generic approach

Linked Feature

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

Kalypso's GML-Support

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

- under development
  - external xlinks (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
Who we are...

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