

# Developing Apps for tempo-spatial meteorological satellite data - using OGC Services

EUMETSAT ImageGallery

Key Concepts for better MapApps

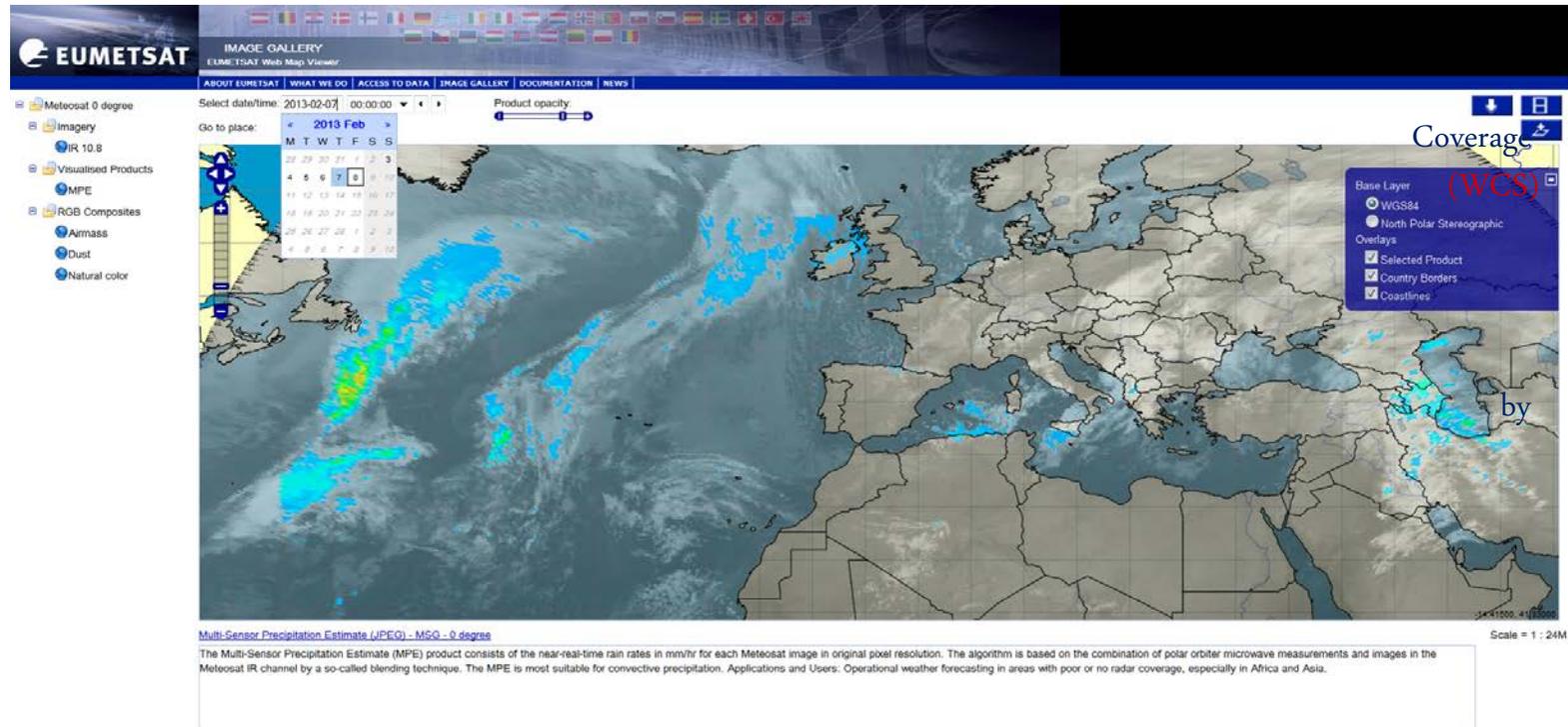
Uwe Voges (con terra GmbH)

Michael Schick (EUMETSAT)

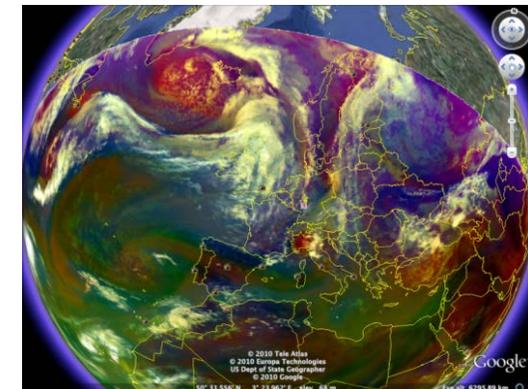
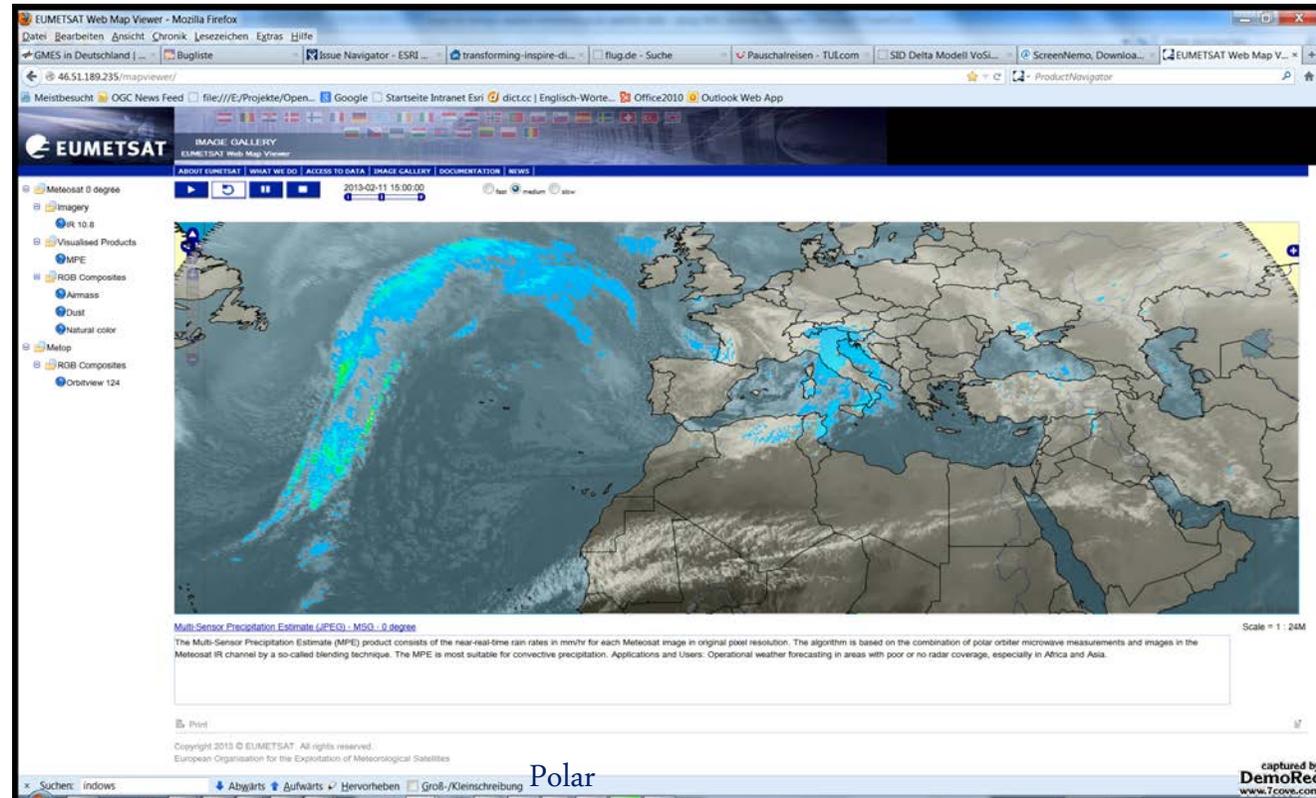
Udo Einspanier (con terra GmbH)

- New EUMETSAT Image Gallery webApp:
  - Under development in context of EO Portal
  - EUMETSAT data is visualized by OGC Web Map Services (WMS), including
    - On-the-fly Image generation for user-defined area
    - retaining native resolution, data values, georeferencing information
    - WMS 1.3.0 supporting horizontal and temporal Reference System (RS)
      - Important time support, e.g. moments (TIME=2000-08-03) or intervals

- provision of OGC Web Services
- Automatic updates of images  
regular 3-hourly feed

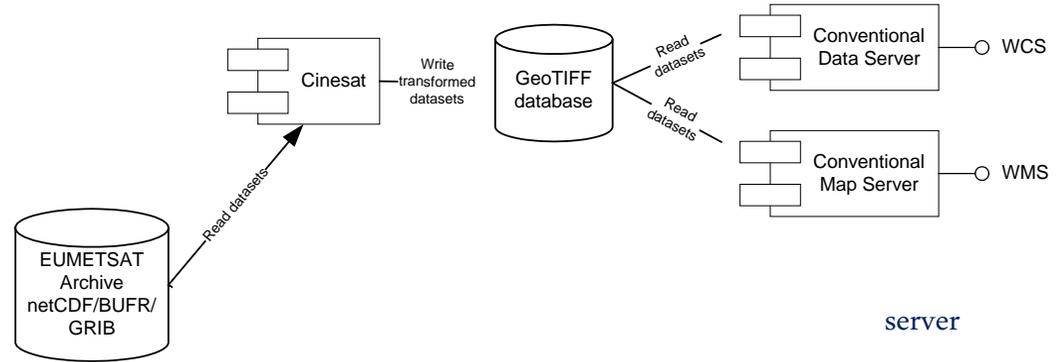


- Client shows global base data from a WMS
- User can select a product from a list
  - Product is overlaid on base map (default: most recent)
  - Available timerange for product is displayed
- User can:
  - Zoom in/out, pan, toggle layer visibility, switch background layer
  - Switch SRS (e.g. North Stereographic)
  - Add custom WMS
  - Select date and time for product
  - Show product abstract
  - Display product in GoogleEarth
- Animation support: first select animation settings



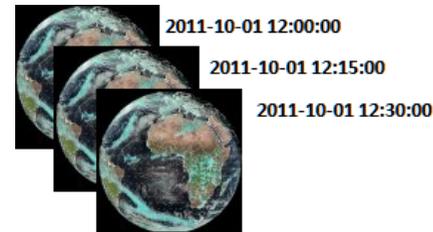
# New ImageGallery Server – Data Organization

- **meteorological products** mainly stored in formats:
  - BUFR (edition 4)
  - GRIB (second edition)
  - Cinesat converts into GeoTIFF
    - Most COTS geodata and map support GeoTIFF

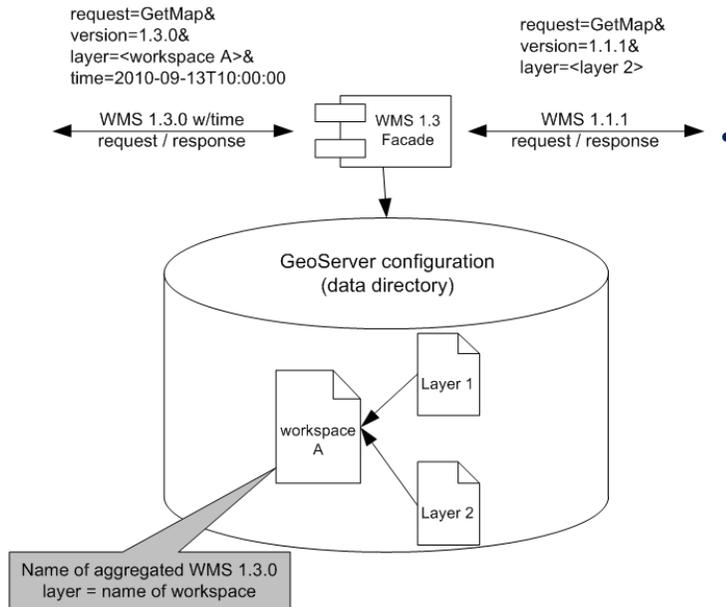
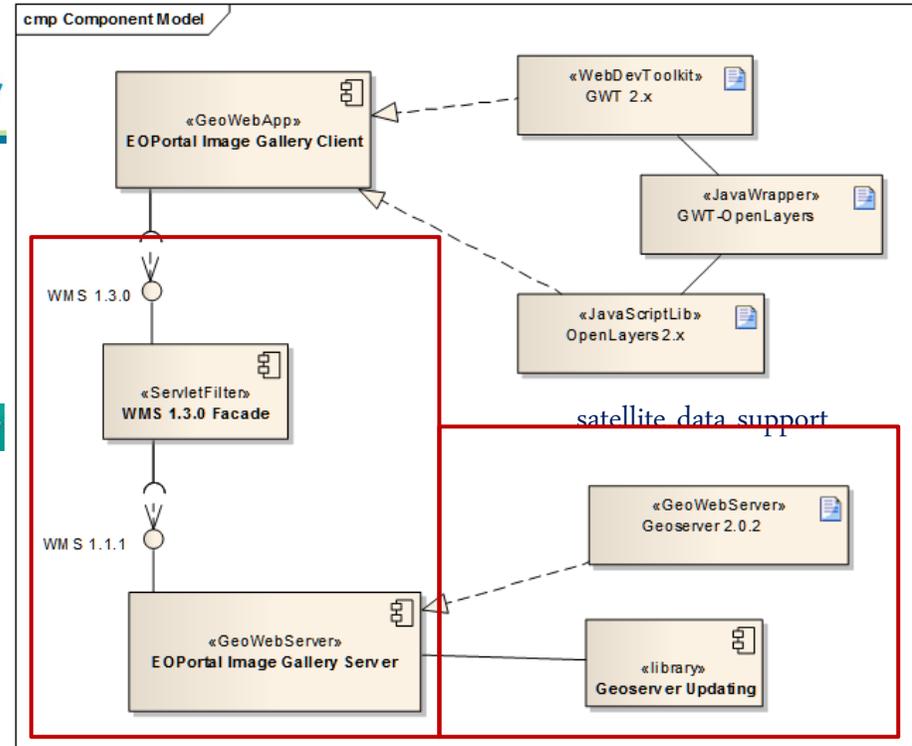


- For **temporal dimension** a specific **physical** and **logical view** must be prepared:

- one physical dataset for each timestep used
  - Advantage: every image format can be used
- Web mapping requires logical organization of data as layers
  - here: one single layer represents the whole period
  - responsibility to request / return data for timeframe is on server & client-side
  - Time selection tbd by special parameter within requests
    - requires map service supporting WMS 1.3.0 with dimension parameters



- based on **Geoserver 2.2.4**
  - open source, written in **Java**
  - supports WMS- and WCS-Interfaces
  - lots of input (incl GeoTIFF) and output formats
  - Important(!): RESTful interface for configuration
- ArcGIS considered:** good option
  - Image Server extension for
  - WMS/WCS and RESTful config interface too
  - lots of client development tools based on JS
  - But: ArcGIS 10 last version with Solaris support**

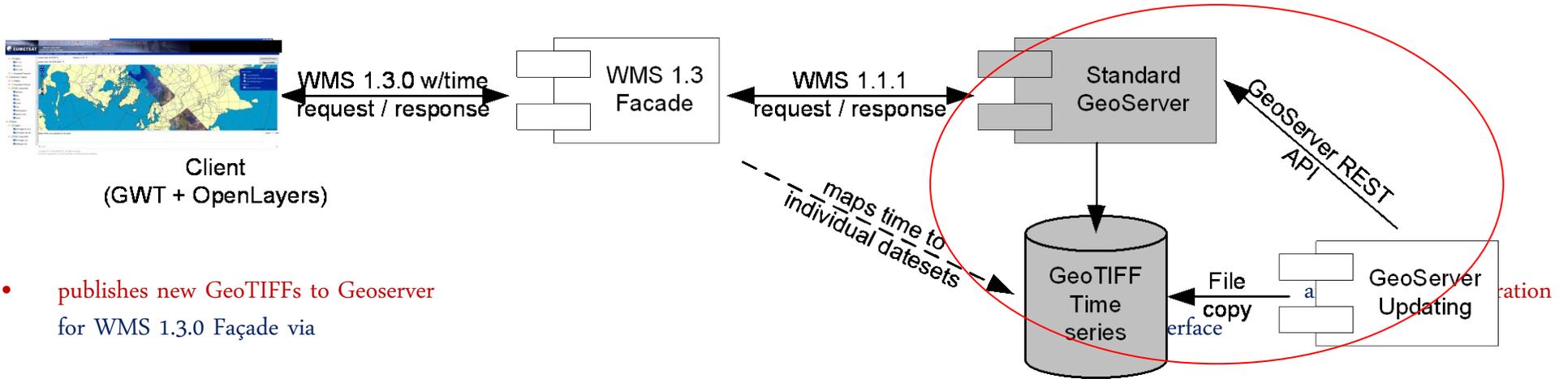


For time dimension support a **WMS 1.3.0 Façade** (servlet filter) was developed

- aggregates images representing points in time to **virtual layer with time dimension (workspace)**
- transforms WMS 1.3.0 requests to WMS 1.1.1 requests**
  - The latter reference image(s) corresponding to requested time)

# New ImageGallery – Implementation Server/Client

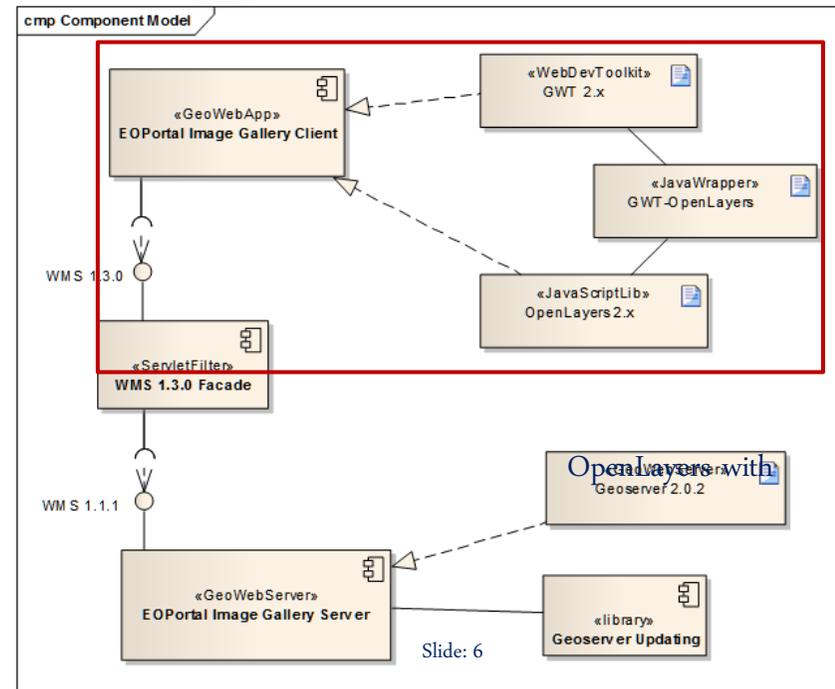
- for automatic updates of images, a “Publisher” (Geoserver Updating) was implemented



- publishes new GeoTIFFs to Geoserver for WMS 1.3.0 Façade via

Image Gallery Client:

- webApp accessing products via WMS 1.3.0
- implemented with:
  - Google Web Toolkit (GWT) 2.x
  - JavaScriptAPI OpenLayers 2.8 for mapdisplay
  - GWT-OpenLayers (Java wrapper to integrate GWT)



- Frequent shortcomings of map applications (applies partly for the ImageGallery too):
  - Focussed often on “geo-IT terminology”: layers, CRS, opacity, ...
    - user often do not (want to) know anything about this
  - “Content overload”
    - often provide too much content in one single app in parallel
    - not focussed on specific content/solution
  - Device often not recognized:
    - Mobile solutions often don't consider device specific features
  - Design:
    - often driven by technologists and not by user interface designers
  - Known concepts of app controls not considered
    - Users prefer interface that is aligned with known concept
  - Too much development needed
    - For adaptations of existing apps or for the creation of new focussed apps there is much programming needed
- In the following a few key concepts will be shown which should be taken into account for better map apps

- Problem Fit: Simplified & Focussed
  - Risk analysis (flooding, heavy rain, storm) for German Bundesland Saxonia

Freistaat SACHSEN

ZÜRS public  
öffentliche Testversion

An der Elbe 9, 01796 Pirna [Pirna]

GDV  
DIE DEUTSCHEN VERSICHERER

Über | Impressum | Hilfe

Risikoanalyse für folgende Adresse:

An der Elbe 9, 01796 Pirna [Pirna]

Klicken Sie auf das -Symbol, um die entsprechende Risikokarte einzublenden.

Hochwasser

Starkregen

Sturm/Hagel

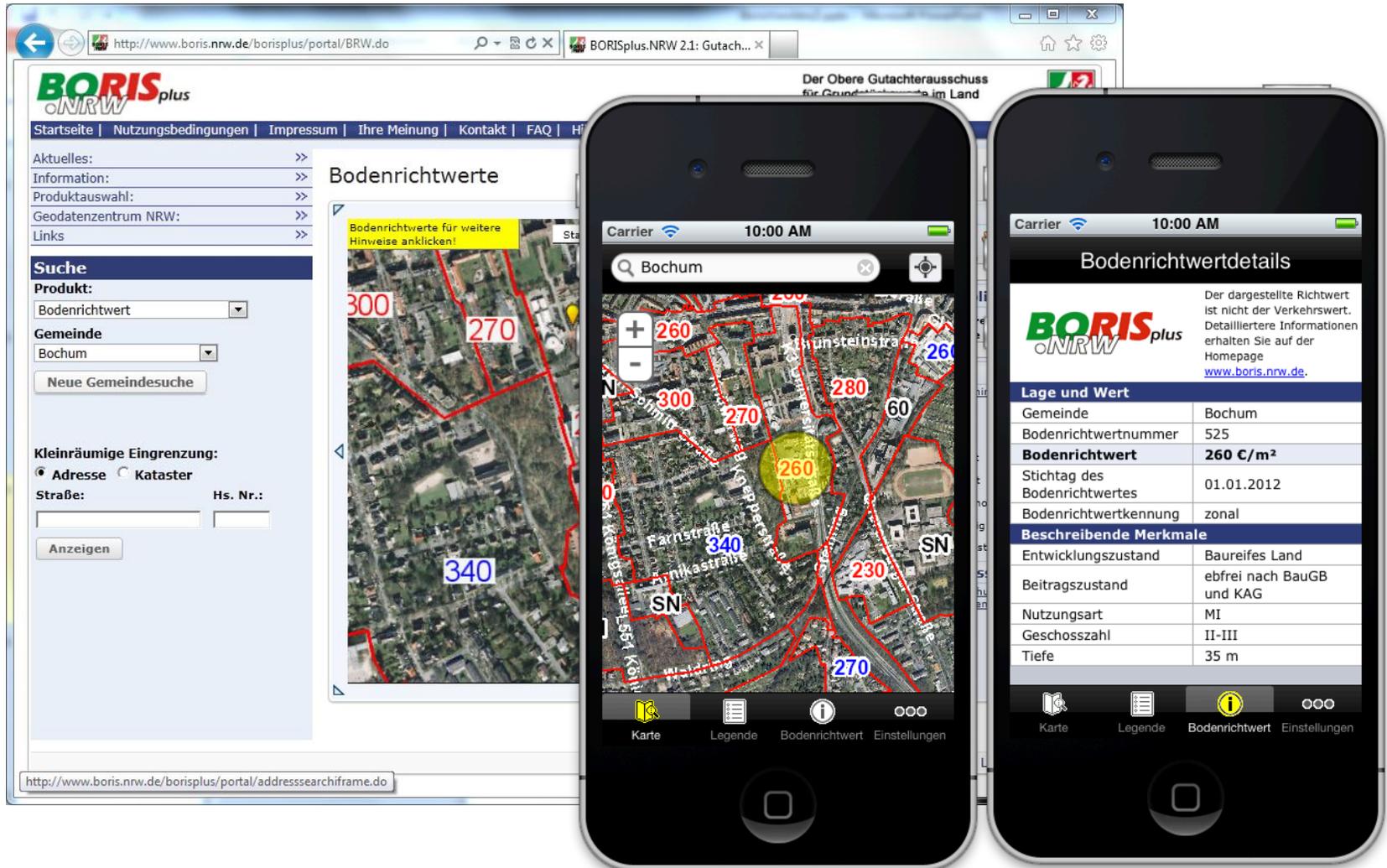
Blitz/Überspannung

Drucken

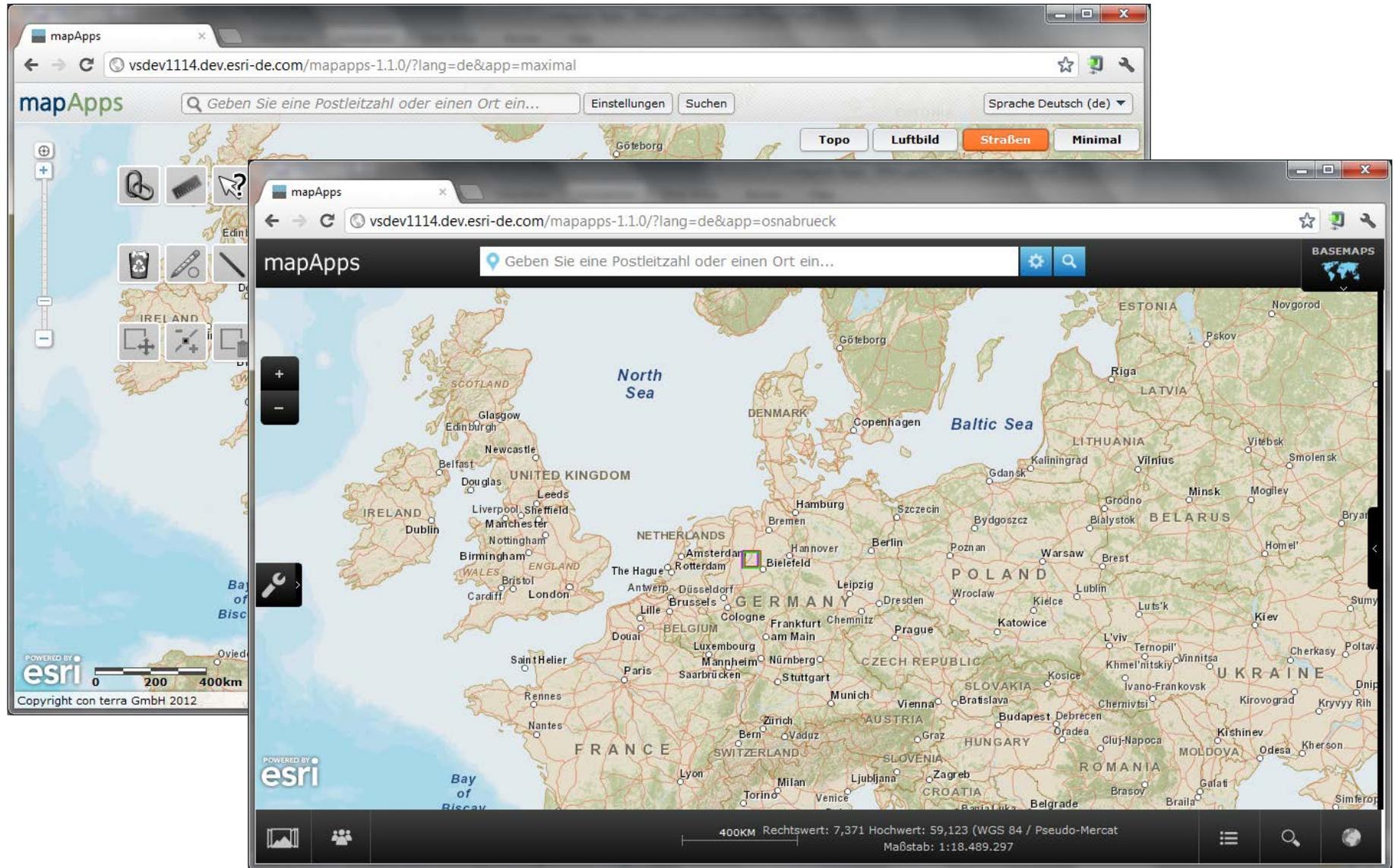
© GDV 2012 Hochwasserdaten des Landes Sachsen  
powered by con terra

Sachsen sorgen vor. Weitere Infos unter:  
[www.naturgefahren.sachsen.de](http://www.naturgefahren.sachsen.de)

- Recognize the Context: Device
  - Ground values for German Bundesland NRW



- Design (better composed, more clear)



- Known Concepts: mapFlow (like music selection/information in iPod)

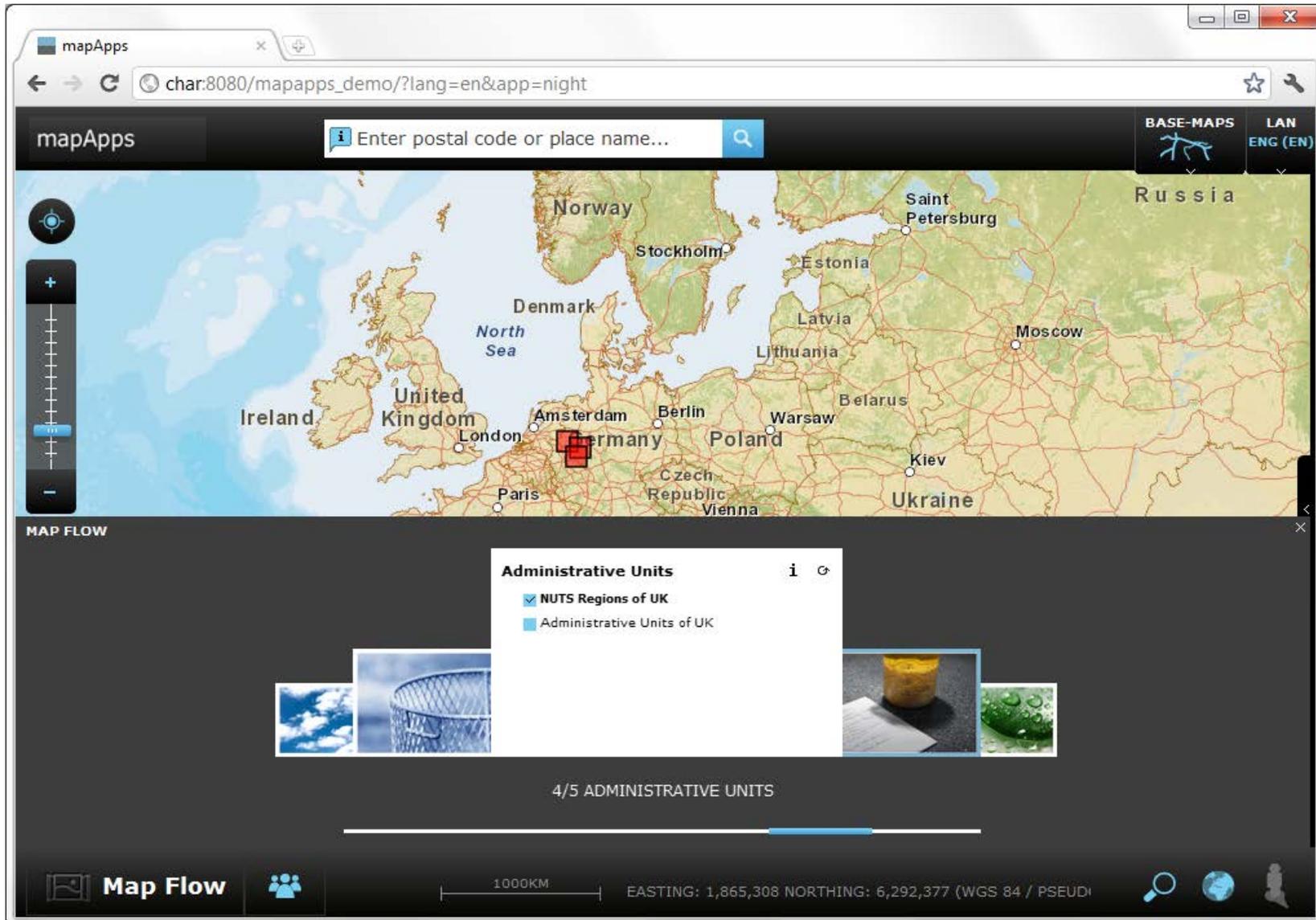
The screenshot displays a web browser window with the address `char:8080/mapapps_demo/?lang=en&app=night`. The application interface includes a search bar with the placeholder text "Enter postal code or place name...", a "BASE-MAPS" button, and a language selector set to "LAN ENG (EN)".

The main map shows a geographical view of Europe. A red square highlights a region in Germany. Labels on the map include Norway, Denmark, United Kingdom, Ireland, London, Paris, Amsterdam, Berlin, Warsaw, Poland, Czech Republic, Vienna, Ukraine, Kiev, Belarus, Lithuania, Latvia, Estonia, Saint Petersburg, Moscow, and Russia.

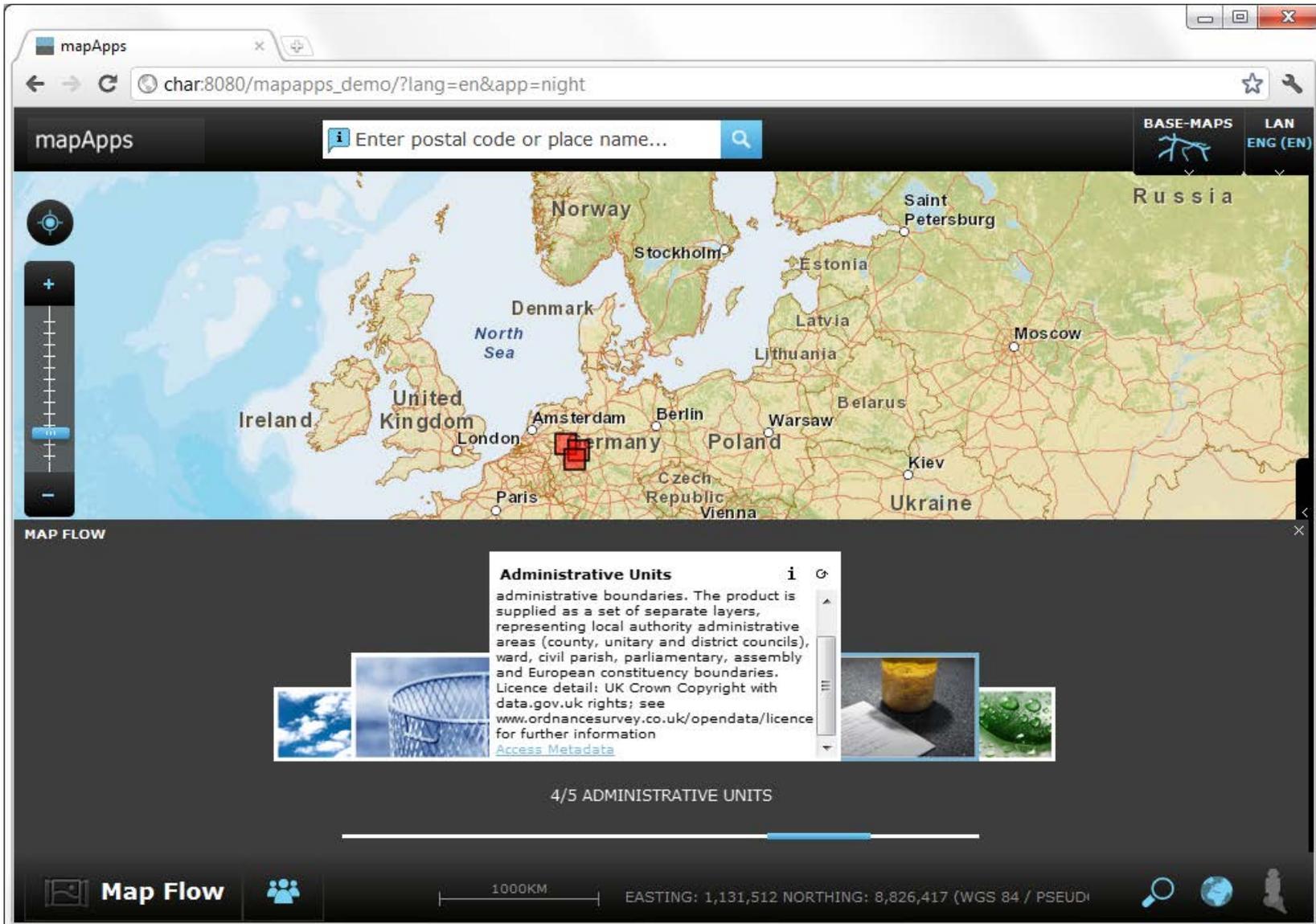
Below the map is a "MAP FLOW" section. It features a central map of Europe with a logo for "INSPIRE - Infrastructure for Spatial Information in Europe". Surrounding this central map are several small image thumbnails: a blue sky, a metal mesh cylinder, a glass of orange juice, and green water droplets.

Below the thumbnails, the text "4/5 ADMINISTRATIVE UNITS" is displayed. At the bottom of the interface, there is a scale bar for 1000KM, the coordinates "EASTING: -1,872,157 NORTHING: 3,777,904 (WGS 84 / PSEUC)", and navigation icons including a magnifying glass, a globe, and a person icon.

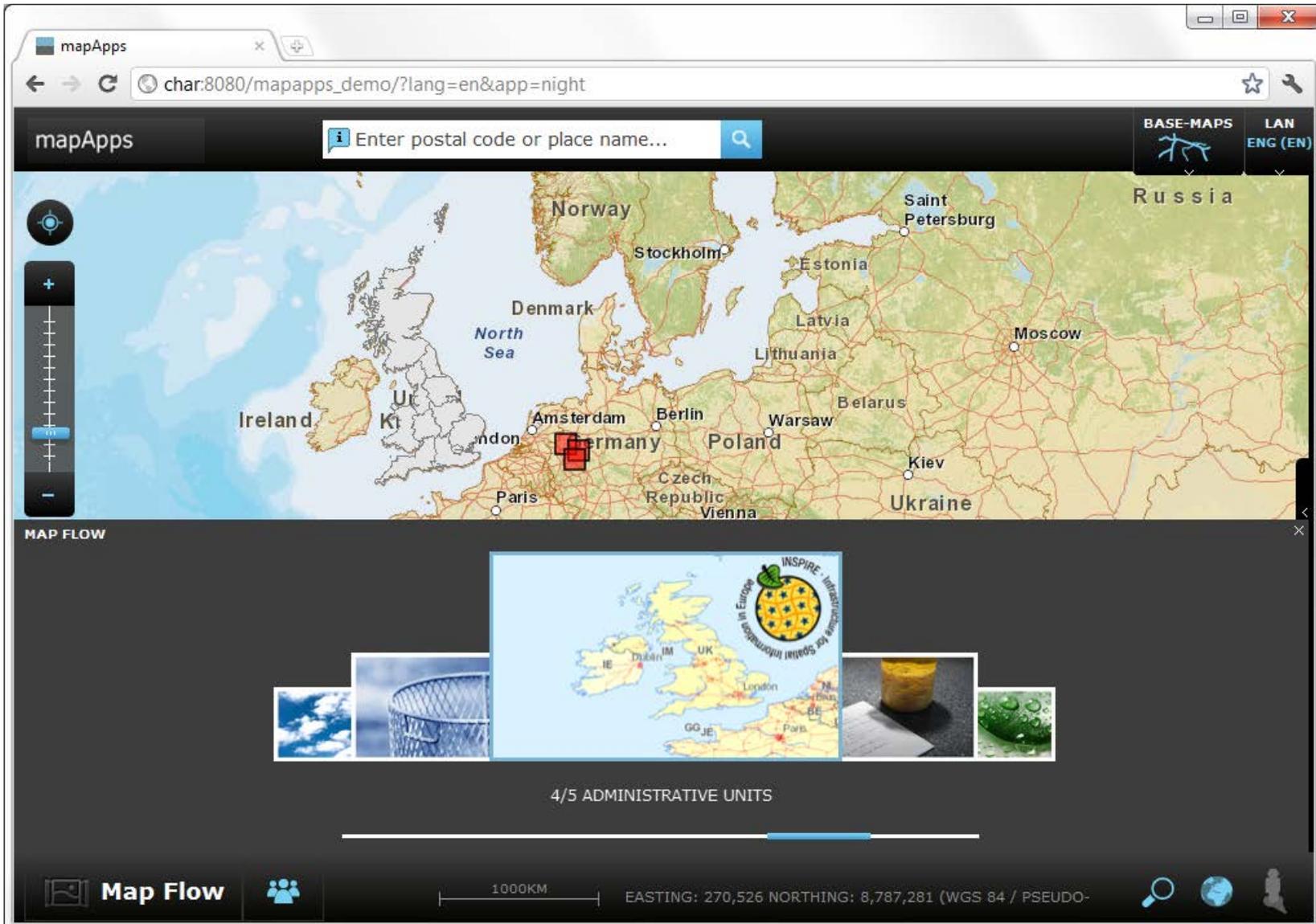
- Known Concepts: mapFlow



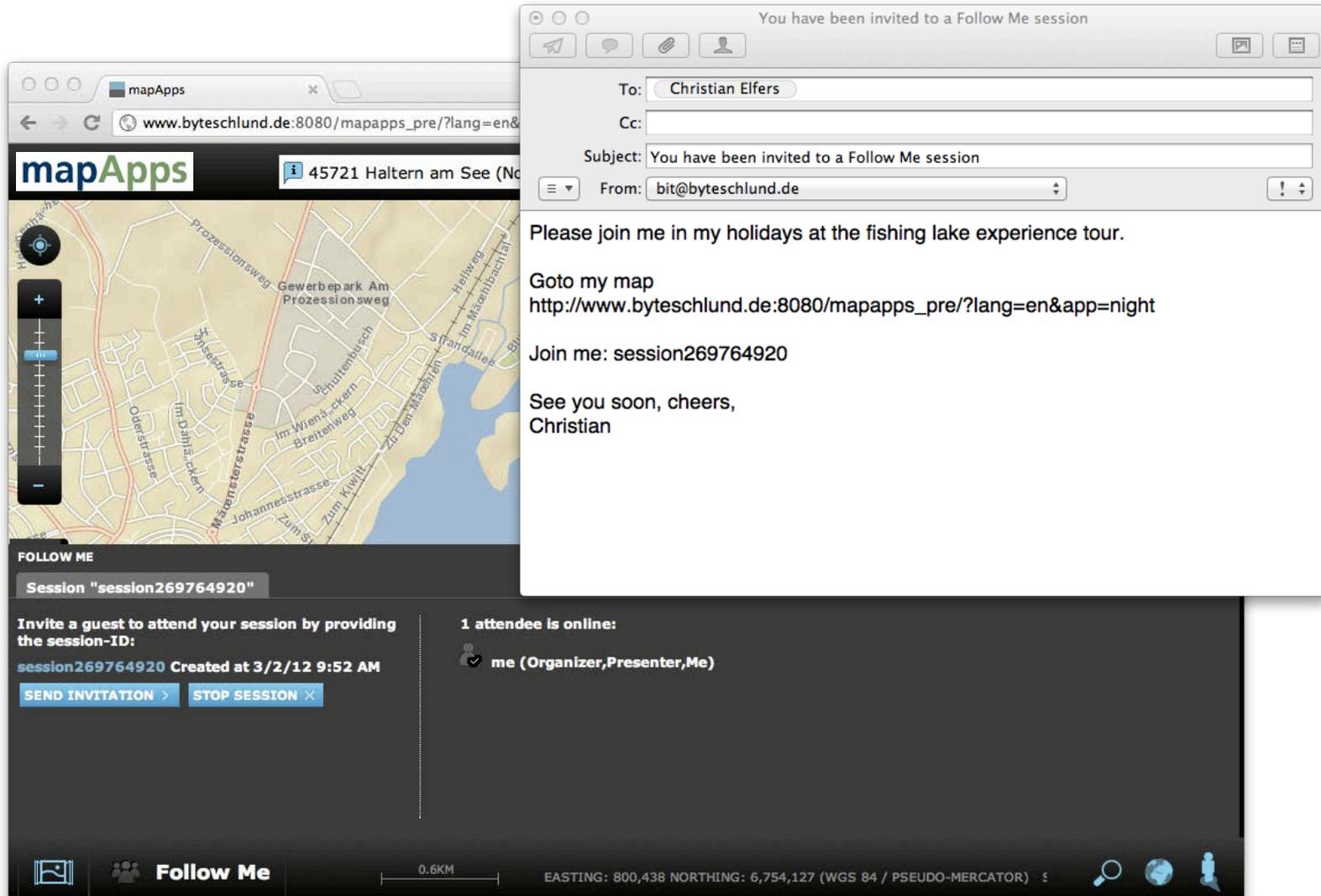
- Known Concepts: mapFlow



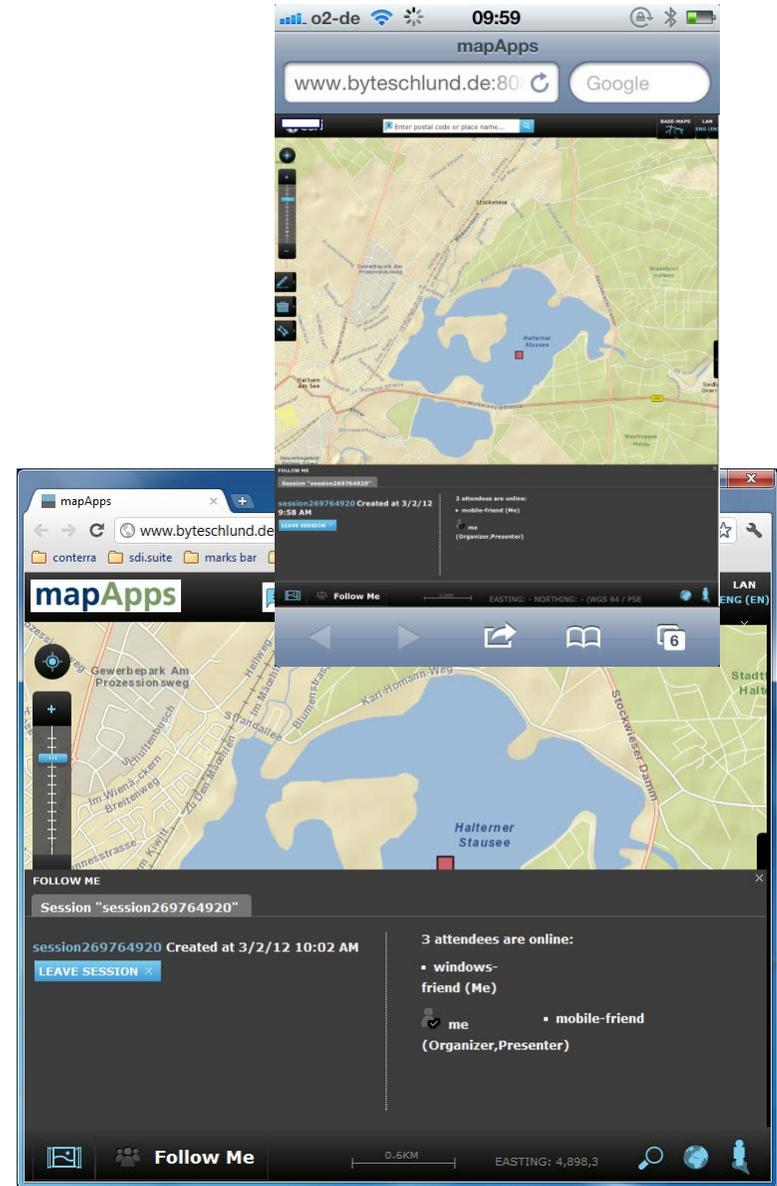
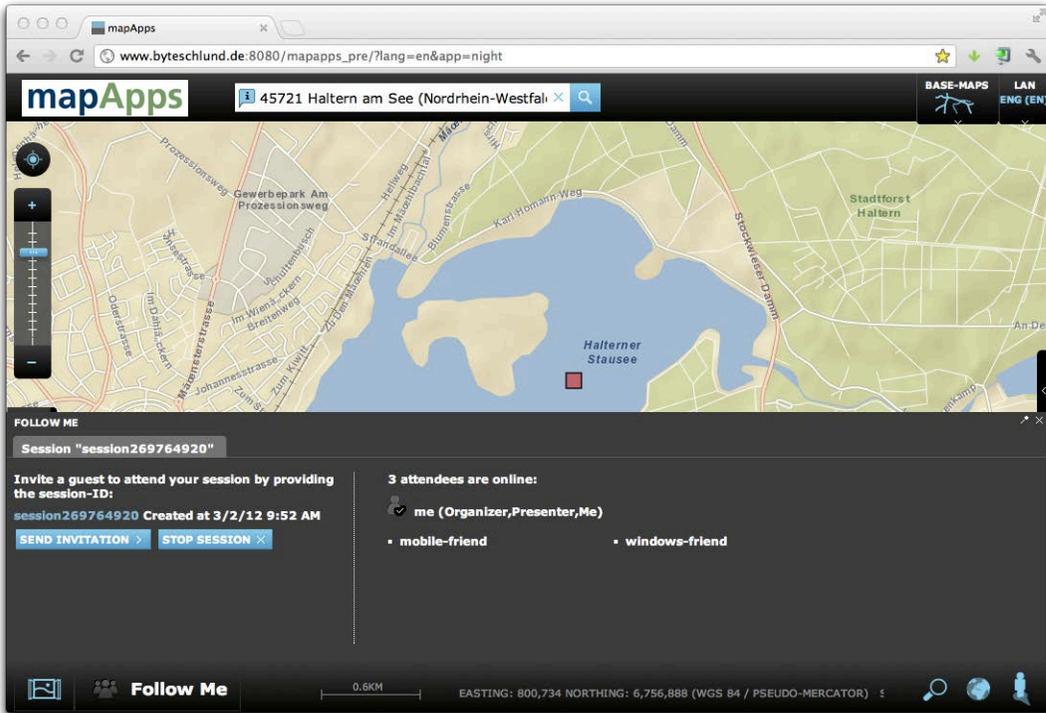
- Known Concepts: mapFlow



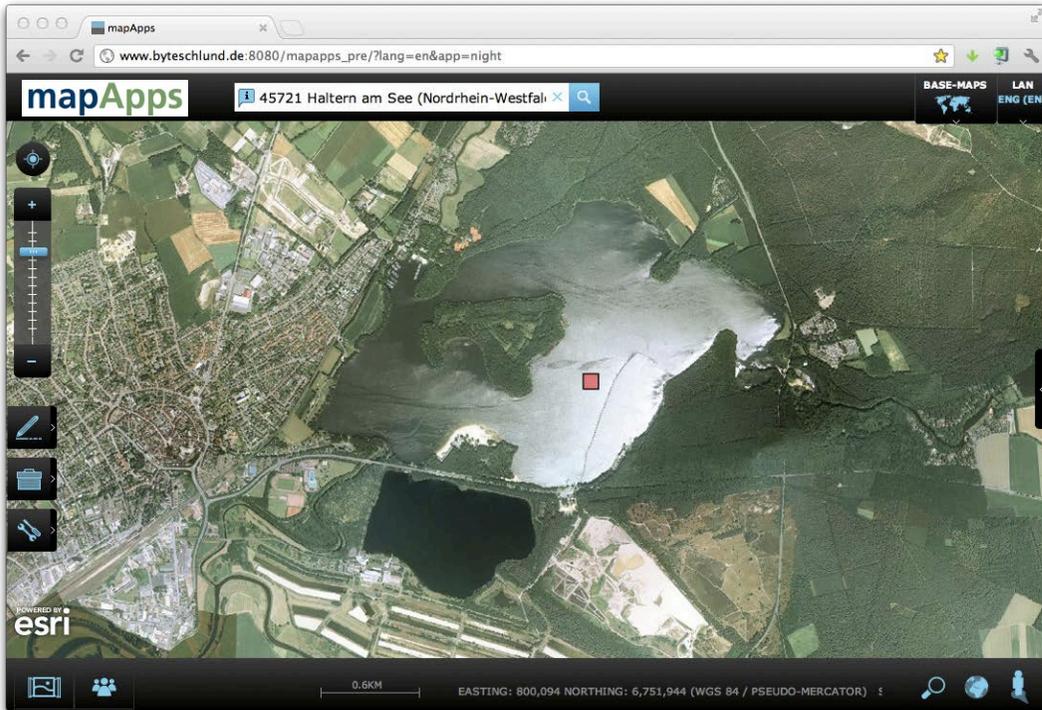
- Collaboration: FollowMe



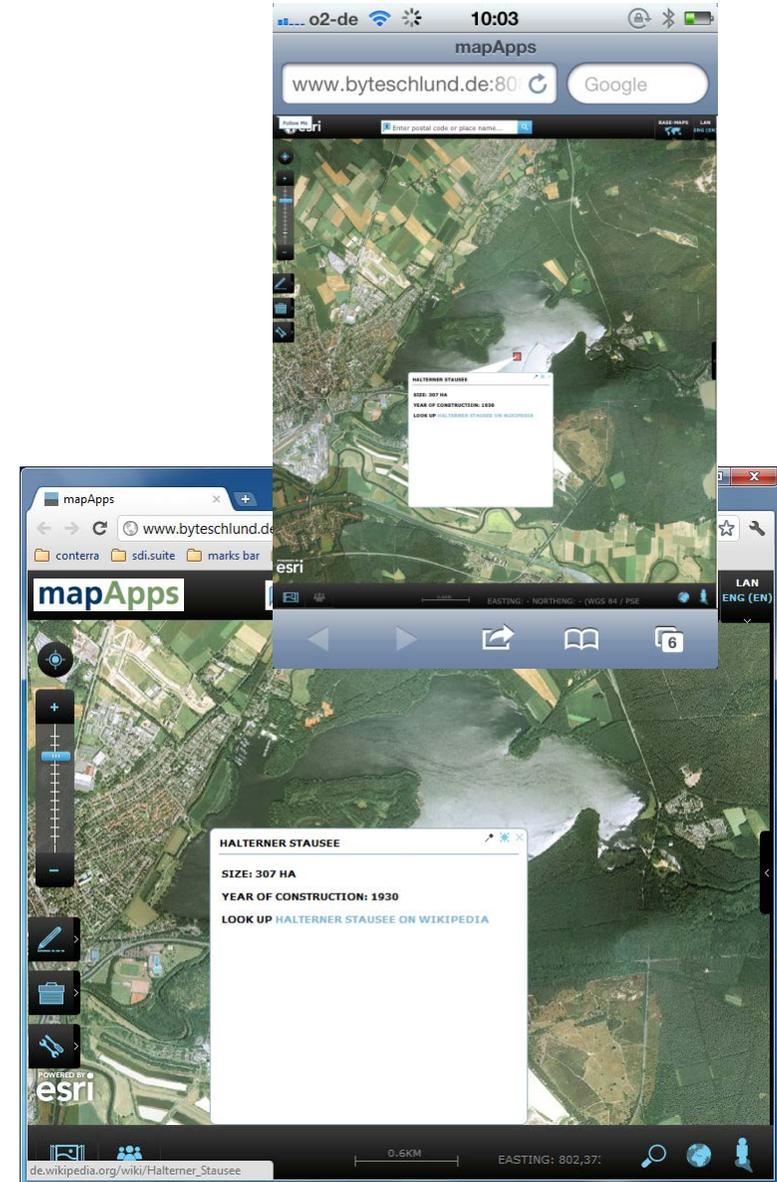
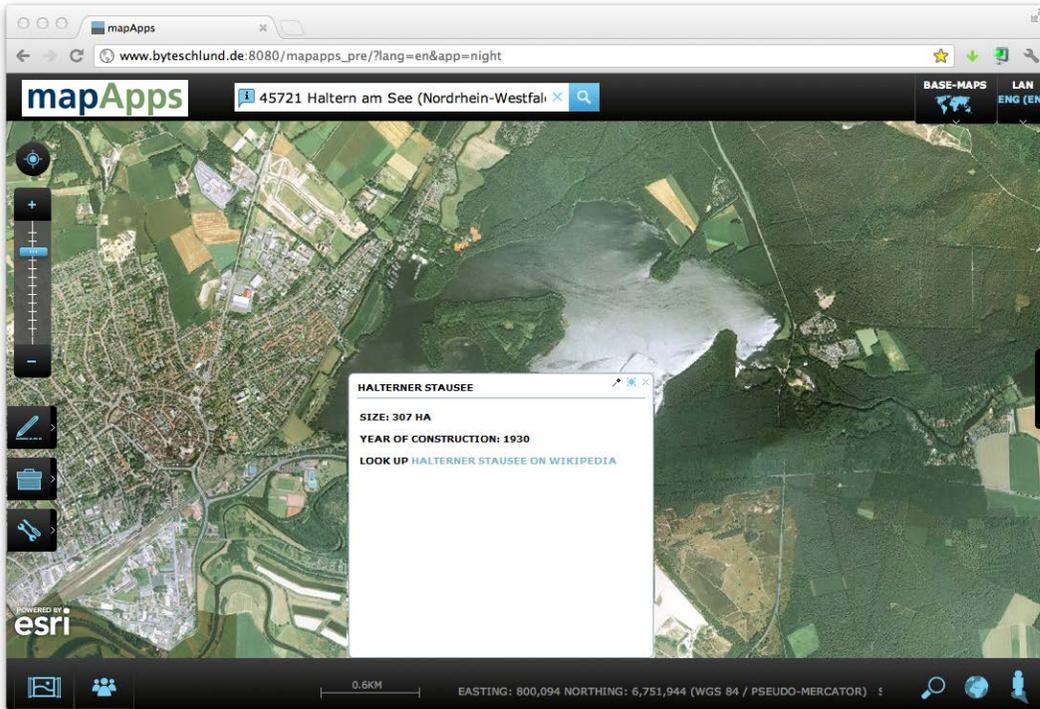
- Collaboration: FollowMe



- Collaboration: FollowMe



- Collaboration: FollowMe



- **map.apps**: software solution to build focussed geospatially enabled app's in an attractive, easy-to-use form
  - Provides **Standard Architecture, Platform** and **Building Blocks**
  - **Cross-platform** (web/mobile) and **cross-device** capable
  - Pure JavaScript/HTML(5) Client (no plug-ins)
  - Based on ArcGIS:
    - Esri JavaScript API, REST API, ArcGIS Server, ArcGIS Online
  - OSGi Framework for JavaScript
    - s. Javamagazin 3/2013
  - **app.Builder** creates app's based on **App-Templates**

