

Transboundary water management with Remote Sensing

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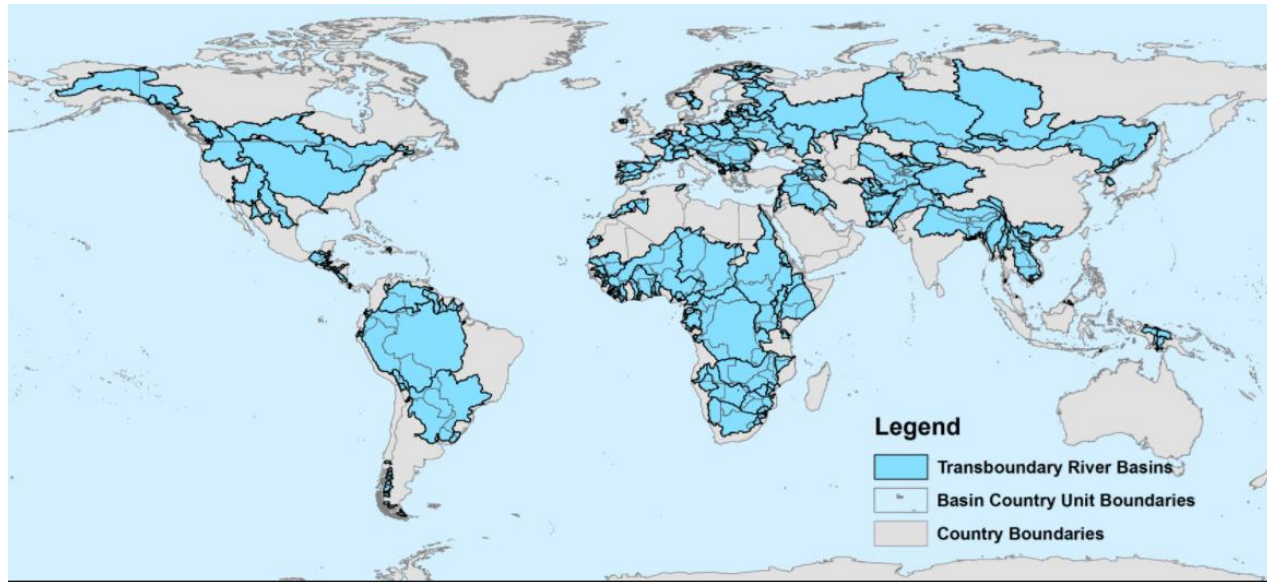


Transboundary water management

- Water management across national boundaries
- River basin organisations responsible for the overall water resource planning within the transboundary river basin

Consistent data set
across the river basin(s)

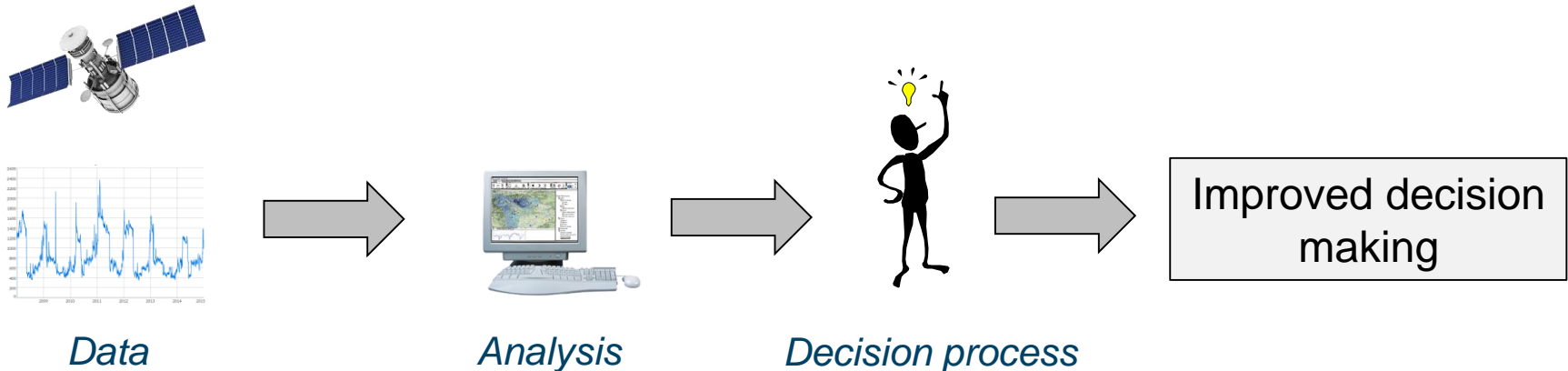
Data and information for
models or tools used for
water resources
assessment or evaluation
of investments



Background

Data availability is a key issue in water resources management

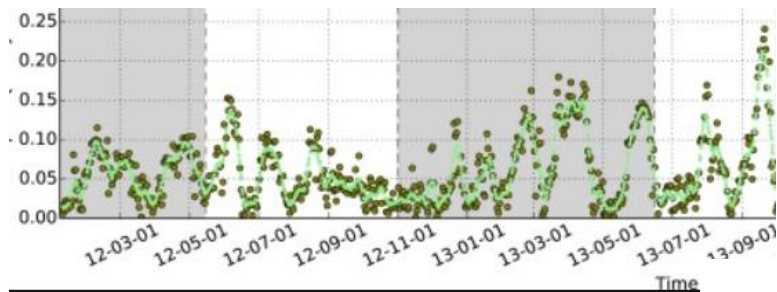
- Data availability is a key concern in many countries and basins
- Availability of a “basic” set of data for water resources management is critical



Background

Station data

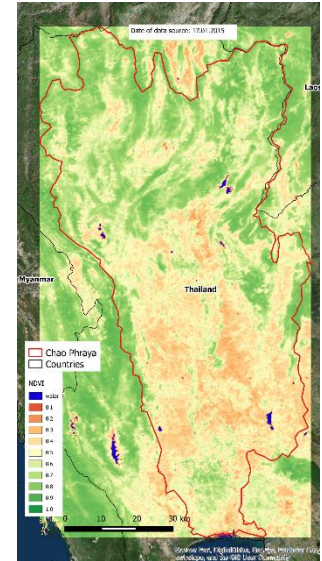
- Many countries have a good coverage of ground stations
- Data at point locations (time series)
- Need country specific permission to access data
- Quality could vary depending on the maintenance and QA of the station



Background

Satellite data

- Spatial coverage in close to real time
- Temporal and spatial resolution varies
- Often freely available
- Constrains regarding data format and accessibility
- Quality could be a concern



DHI Floods and Drought Portal for river basin management

Objective



Provide access to near real time satellite data



Support but not replace national data



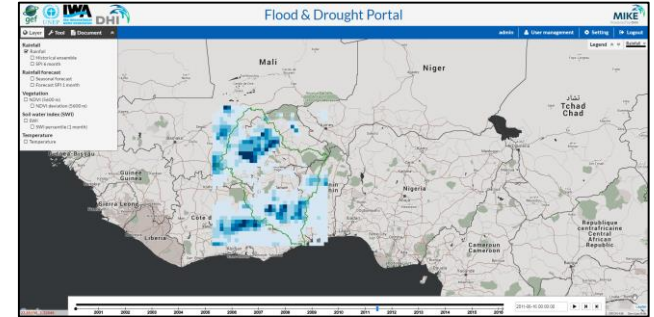
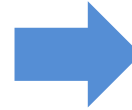
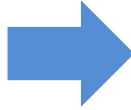
Vision:

Bias correction of satellite based data using local ground data

Embed ground station information

DHI Flood and Drought Portal

Daily update
Download
QA



Daily update

Number cruncher

WEB server

Download on global scale
Reproject and convert to netcdf
QA of data quality

Subset to basin scale
Calculate indices
Calculate weighted time series
QA and monitor process
Push to web-server

Data available as GIS layers and time series
User configuration and control



Technical overview – web portal




Flood & Drought Portal

The screenshot shows the web portal interface with a sidebar menu on the left, a map of West Africa in the center, and a time-series chart on the right. Annotations with arrows point to specific features:

- Data selection:** Points to the sidebar menu containing categories like Rainfall, Rainfall forecast, Vegetation, Soil water index (SWI), and Temperature.
- View spatial data at specified time step:** Points to a blue-shaded area on the map representing spatial data.
- Area weighted time series for the whole basin, subareas or point locations:** Points to the 'Rainfall - All focus area' chart, which displays a time series of rainfall in mm from 2000 to 2016, with a red line for the mean and a grey area for the data.
- Time line for data availability:** Points to a horizontal timeline at the bottom of the page, ranging from 2001 to 2016.
- Specific time step:** Points to a date input field at the bottom right, currently set to '2011-06-16 00:00:00'.

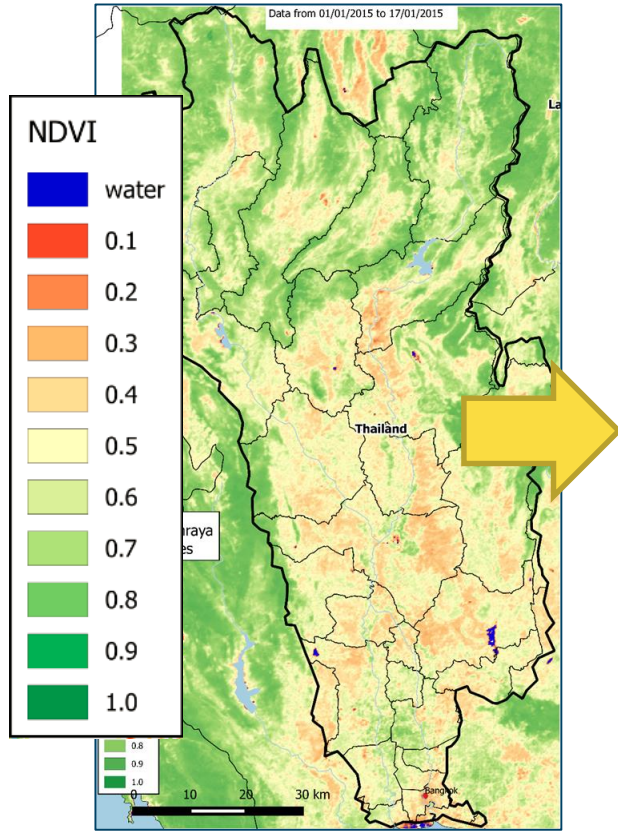
Data in the DHI Floods and Drought Portal

Types of data

Climate	Vegetation	Soil moisture	Socio economic	Indicators
<p>Key input for environmental assessment</p> <ul style="list-style-type: none"> • Historic • Near real time • Forecast • Projection 	<p>Impact on agricultural sector</p> <p>Crop distribution and crop growth</p> <ul style="list-style-type: none"> • Historic • Near real 	<p>Water availability</p> <p>Drought assessment Flood risk</p> <ul style="list-style-type: none"> • Historic • Near real time 	<p>Socio economic impact</p> <p>Static data</p> <ul style="list-style-type: none"> • Historic • Future 	<p>State of any environmental issue</p> <p>Statistical measure providing a clear indication of a state</p>



Indicators



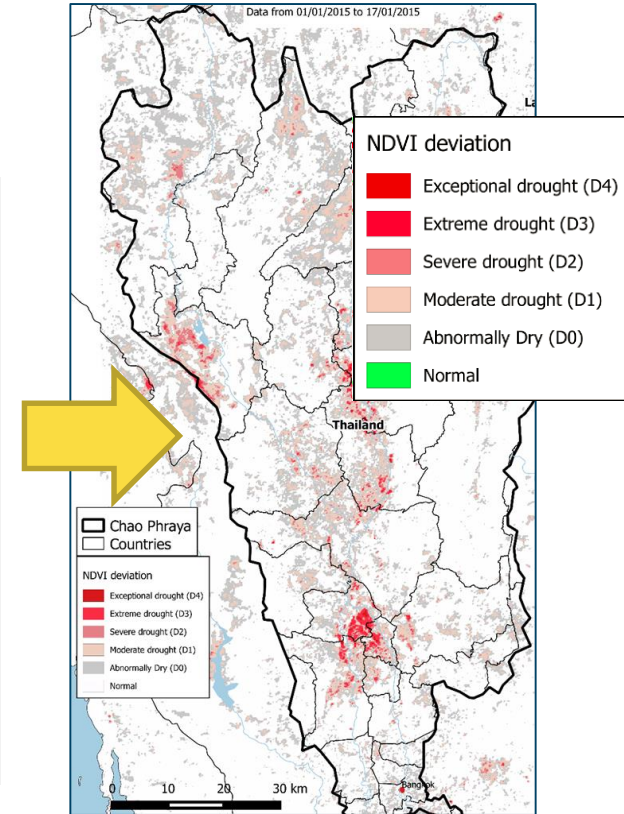
Satellite data (NDVI)

Data -> Indicator

How the current value compare to historical values?

Expressed as a deviation, anomaly, percentile etc.

A large number of indicators are made available



Classification

Indicators for water management

Indices provides the link to:

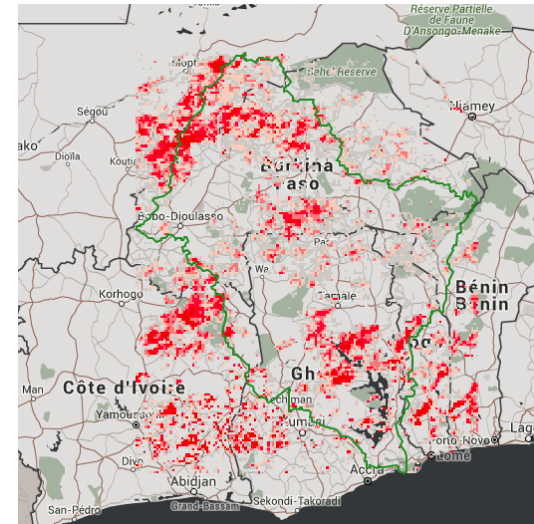
- Impact categories (drought or flood)
- Impacted areas
- Essential for warning and assessments

Indices are updated in near real time along with the data.

- Deviation or anomaly
- Percentile or change in percentile

Category	Description	Impact
Normal	Normal	<i>Normal conditions</i>
D0	Abnormally Dry	<i>Short-term dryness some water deficit</i>
D1	Moderate Drought	<i>Some damage to crops</i>
D2	Severe Drought	<i>Crop or pasture losses likely; water shortages common</i>
D3	Extreme Drought	<i>Major crop/pasture losses; widespread water shortages</i>
D4	Exceptional Drought	<i>Exceptional and widespread crop/pasture losses</i>

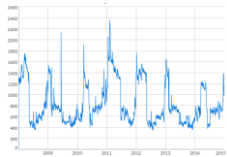
Source: U.S. Drought Monitor Classification Scheme



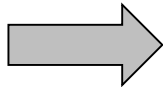
Perspectives

The established data and information portal serves a number of purposes:

- Data access/availability
- Provide a basic data set for planning
- Secondary data source



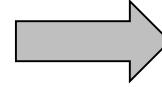
Data



Analysis



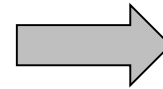
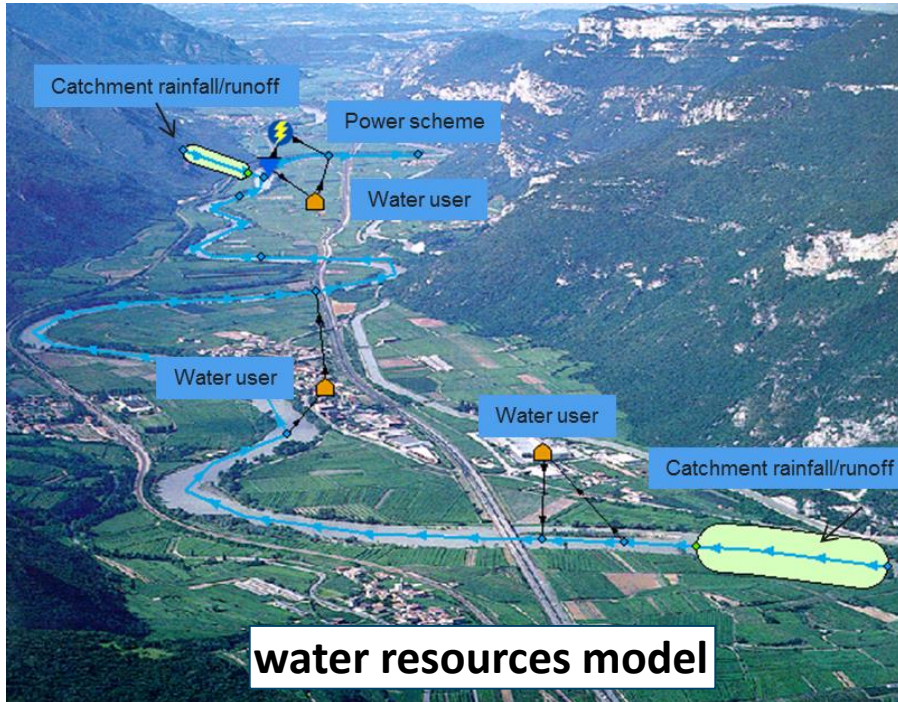
Decision process



Improved decision making

Perspectives


Remote sensing based climate data as key drivers in water management




Improved decision making

Decision process

Flood and Drought Portal



Flood and Drought Portal



HOME
User: admin Workgroup: Private Area: Chao Phraya
🔍 🏠 ?

About the DataPortal

The Flood & Drought portal is developed as part of the Flood and Drought Management Tools project. For more information on the project please visit the project home page at: <http://fdmt.iwlearn.org/en>

The Flood & Drought portal provides access to a number of apps supporting decision makers at basin and local level. The aim is to support existing planning processes as TDA/SAP and IWRM at basin scale and Water Safety Planning at local scale through the technical apps. The apps could be used individually or in connection.

Please visit the [user guide](#) for more indepth information on the use of the apps and their intended support for the different stages within basin and local level planning.


Knowledge portal with discussion forum and upcoming online courses: **Select the "Knowledge portal" in the ? menu or use the link - [KnowledgePortal](#)**

For video tutorials and overview: [YouTube](#)

For technical exercises (pdf files) : [Dropbox](#)


For technical questions please contact:

[Oluf Jessen \(Project manager\)](#) or [Bertrand Richaud \(Water resources expert\)](#)




DATA AND INFORMATION

Access to near real-time data. Flood and drought indices. Climate forecast and climate change data.




DROUGHT ASSESSMENT

Locate and identify hazards, estimate impacts and provide risk assessment.




FLOOD ASSESSMENT

(Under development). Locate and identify hazards, estimate impacts and provide risk assessment.




ISSUE ANALYSIS

Causal Chain analysis and WRIAM. Understand and prioritise the causes behind issues.




WATER INDICATOR

Identify water related indicators to support management and decision-making.




BASIN PLANNING

(Under development). Create and evaluate basin plans. Linkage to water resource model.



WATER SAFETY PLANNING

Support water safety planning



REPORTING

User configured templates providing linkage to overview reports or bulletins. Specific templates for TDA/SAP, IWRM and WSP.