

# EN-WRMT: WebGIS Portal User Training

**Training of Trainers in Eastern Nile Water Resources Models and Tools**

**6 – 10 May 2025**

**Dr. Binyam Tesfaw Hailu, Miss Beimnet Girma, and Mr. Kedir Hajisheko**

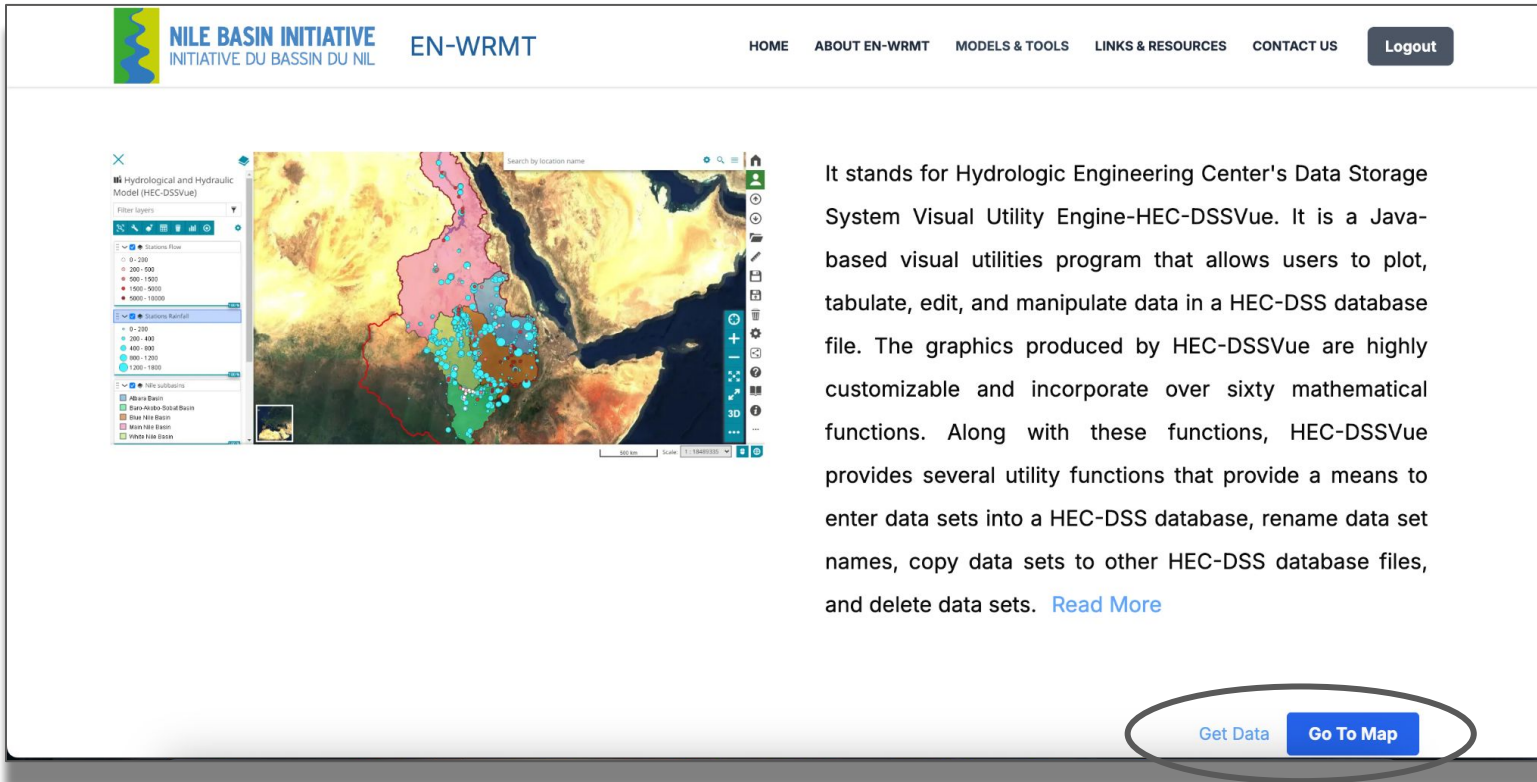
# Sub Sections of the Web GIS Portal



- ❖ HOME
- ❖ ABOUT EN-WRMT
- ❖ EN-Water Resources Models and Tools
- ❖ Links and Resources
- ❖ Contact us
- ❖ Login

# Sub sections: EN-Hydrological and hydraulics models:

## HEC-DSSVue



It stands for Hydrologic Engineering Center's Data Storage System Visual Utility Engine-HEC-DSSVue. It is a Java-based visual utilities program that allows users to plot, tabulate, edit, and manipulate data in a HEC-DSS database file. The graphics produced by HEC-DSSVue are highly customizable and incorporate over sixty mathematical functions. Along with these functions, HEC-DSSVue provides several utility functions that provide a means to enter data sets into a HEC-DSS database, rename data set names, copy data sets to other HEC-DSS database files, and delete data sets. [Read More](#)

[Get Data](#) [Go To Map](#)

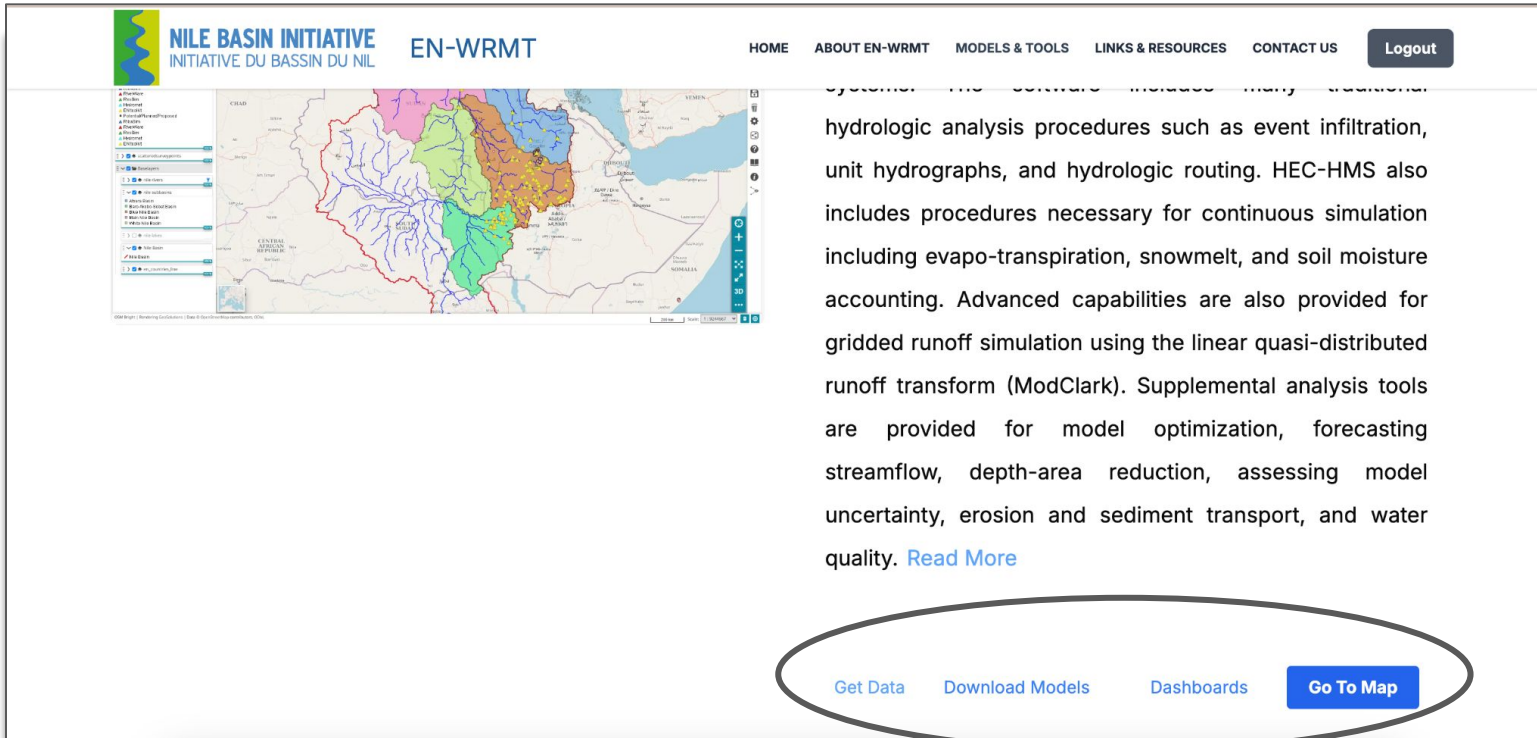
- ❖ **HEC-DSSVue - short description (A link is provided to see the details)**  
<https://www.hec.usace.army.mil/software/hec-dssvue/>
- ❖ - **Get Data** (It takes the users to the DSSVue.dss file uploaded in the database)
- ❖ - **Go to Maps** (It takes the users to the WebGIS Maps with Flow stations average flow rate and Rainfall stations (Number of records))

Get Data

Go To Map

# Sub sections: EN-Hydrological and hydraulics models:

## HEC-HMS



**NILE BASIN INITIATIVE**  
INITIATIVE DU BASSIN DU NIL

EN-WRMT

HOME ABOUT EN-WRMT MODELS & TOOLS LINKS & RESOURCES CONTACT US Logout

hydrologic analysis procedures such as event infiltration, unit hydrographs, and hydrologic routing. HEC-HMS also includes procedures necessary for continuous simulation including evapo-transpiration, snowmelt, and soil moisture accounting. Advanced capabilities are also provided for gridded runoff simulation using the linear quasi-distributed runoff transform (ModClark). Supplemental analysis tools are provided for model optimization, forecasting streamflow, depth-area reduction, assessing model uncertainty, erosion and sediment transport, and water quality. [Read More](#)

[Get Data](#) [Download Models](#) [Dashboards](#) [Go To Map](#)

- ❖ **HEC-HMS - short description (A link is provided to see the details)**  
<https://www.hec.usace.army.mil/software/hec-hms/>
  - **Get Data**
  - **Download Models**
  - **Dashboards**
  - **Go To Map**
    - **Atbara Basin HMS Results and Atbara sub-catchments**
    - **Main Nile Basin HMS Results and Main Nile sub-catchments**
    - **Blue Nile Basin HMS Results and Blue Nile sub-catchments**
    - **Baro-Akobo\_Sobat Basin HMS Results and Baro-Akobo-Sobat sub-catchments**

[Get Data](#)

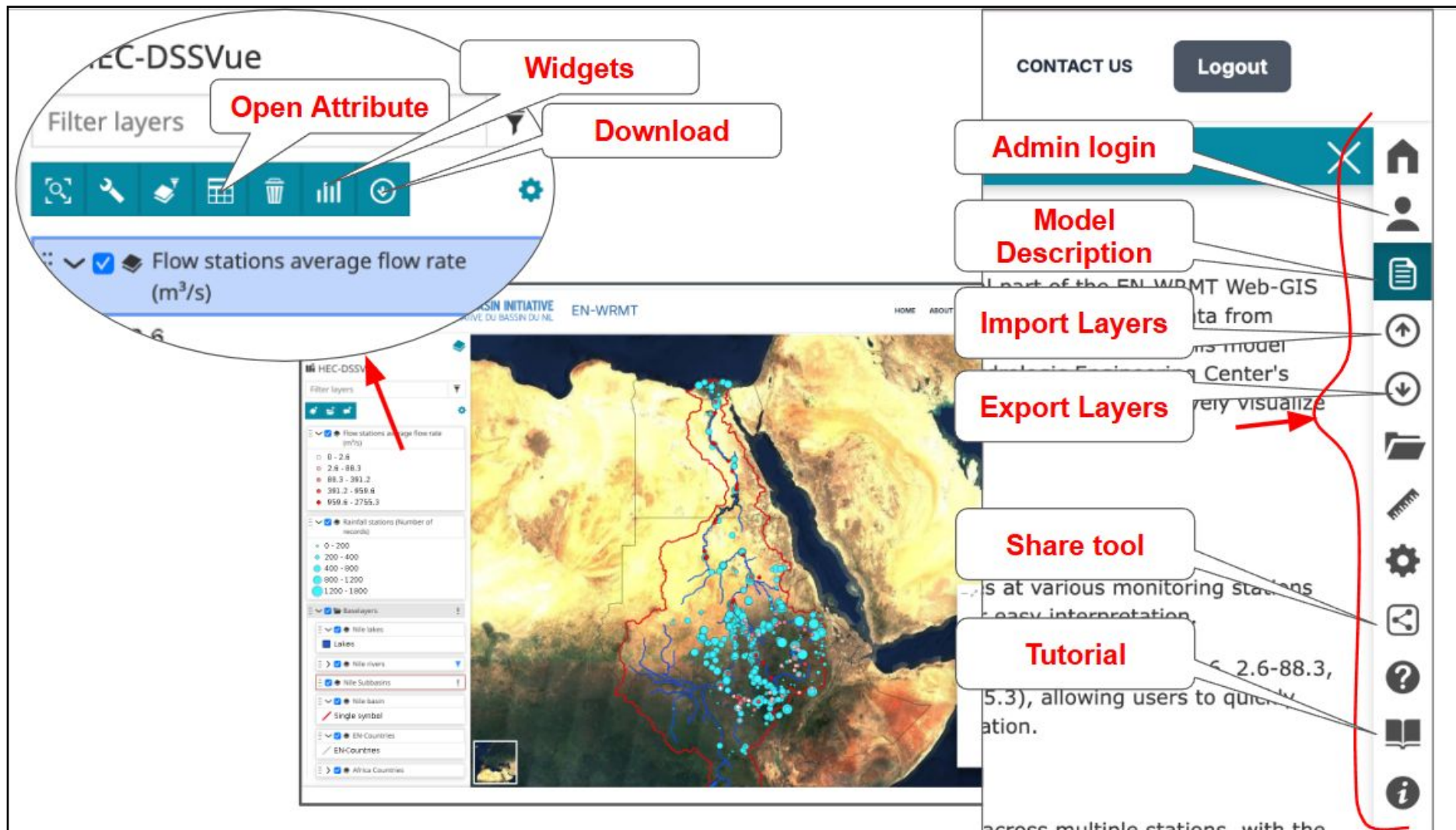
[Download Models](#)

[Dashboards](#)

[Go To Map](#)



# Web GIS Map Elements



The screenshot displays the HEC-DSSVue Web GIS interface. The main map shows a geographical area with a river network and numerous blue circular markers representing flow stations. The interface includes a top navigation bar with 'CONTACT US' and 'Logout' links. A left sidebar contains a 'Filter layers' section with a search bar and a list of layers, including 'Flow stations average flow rate (m³/s)' and 'Rainfall stations (Number of records)'. A right sidebar contains a 'Widgets' section with a 'Download' button and a 'Share tool' button. A bottom sidebar contains a 'Tutorial' button. A red line highlights the 'Admin login', 'Model Description', 'Import Layers', 'Export Layers', 'Share tool', and 'Tutorial' buttons. A red arrow points from the 'Open Attribute' label to the 'Flow stations average flow rate (m³/s)' layer in the left sidebar. A red arrow points from the 'Export Layers' label to the 'Export Layers' button in the right sidebar.

**HEC-DSSVue**

Filter layers

**Open Attribute**

**Widgets**

**Download**

**Admin login**

**Model Description**

**Import Layers**

**Export Layers**

**Share tool**

**Tutorial**

Flow stations average flow rate (m³/s)

Rainfall stations (Number of records)

Baselayers

Nile lakes

Nile rivers

Nile Subbasins

Nile basin

Single symbol

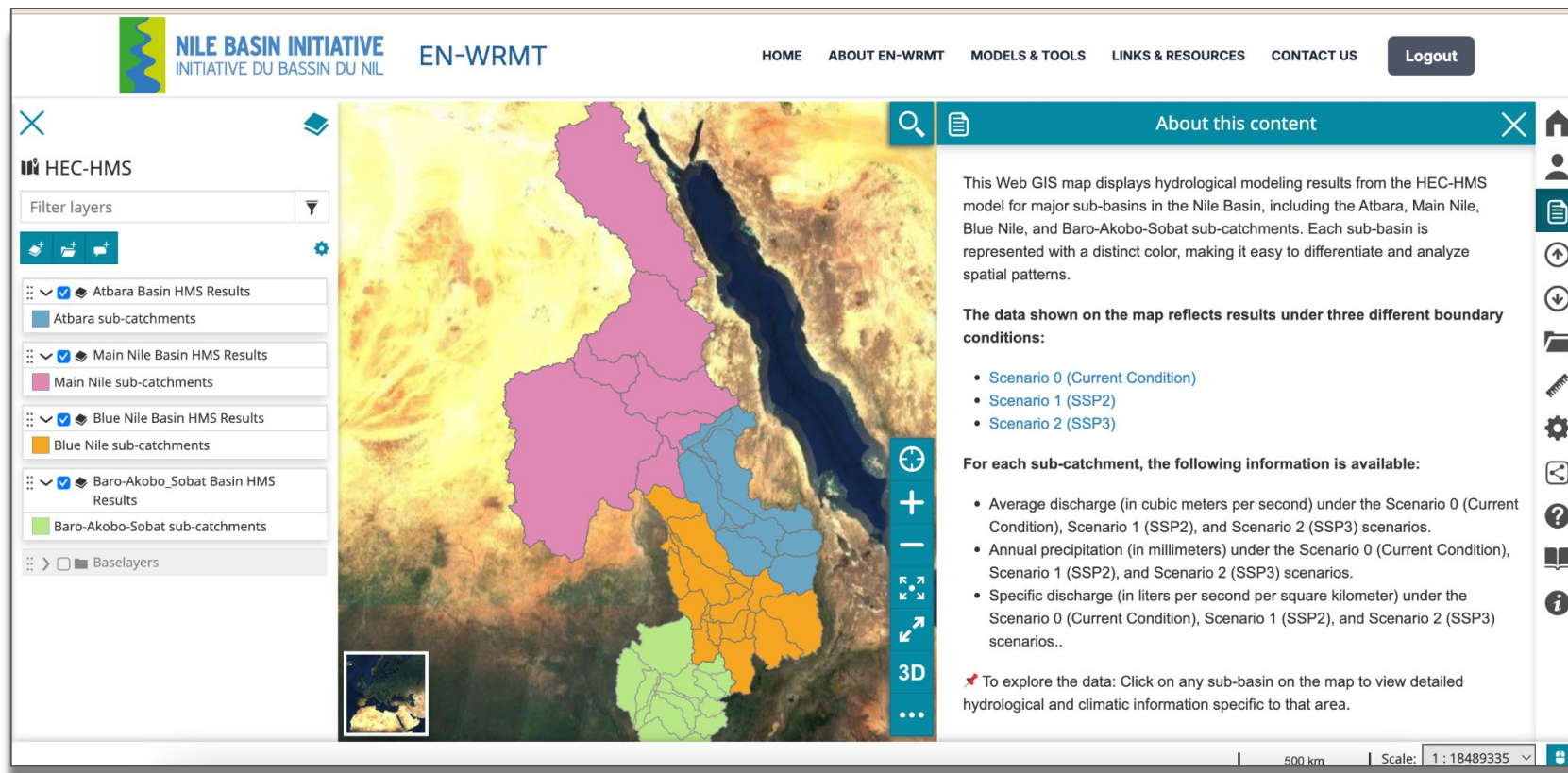
EN Countries

AF Countries

AF Countries

# Sub sections: EN-Hydrological and hydraulics models:

## HEC-HMS



- ❖ **HEC-HMS - short description (A link is provided to see the details)**  
<https://www.hec.usace.army.mil/software/hec-hms/>
- Get Data
  - Download Models
  - Dashboards
  - Go To Map
    - Atbara Basin HMS Results and Atbara sub-catchments
    - Main Nile Basin HMS Results and Main Nile sub-catchments
    - Blue Nile Basin HMS Results and Blue Nile sub-catchments
    - Baro-Akobo\_Sobat Basin HMS Results and Baro-Akobo-Sobat sub-catchments

# Sub sections: EN-Hydrological and hydraulics models:

## HEC-HMS Models

### HEC HMS Models

Click to Download

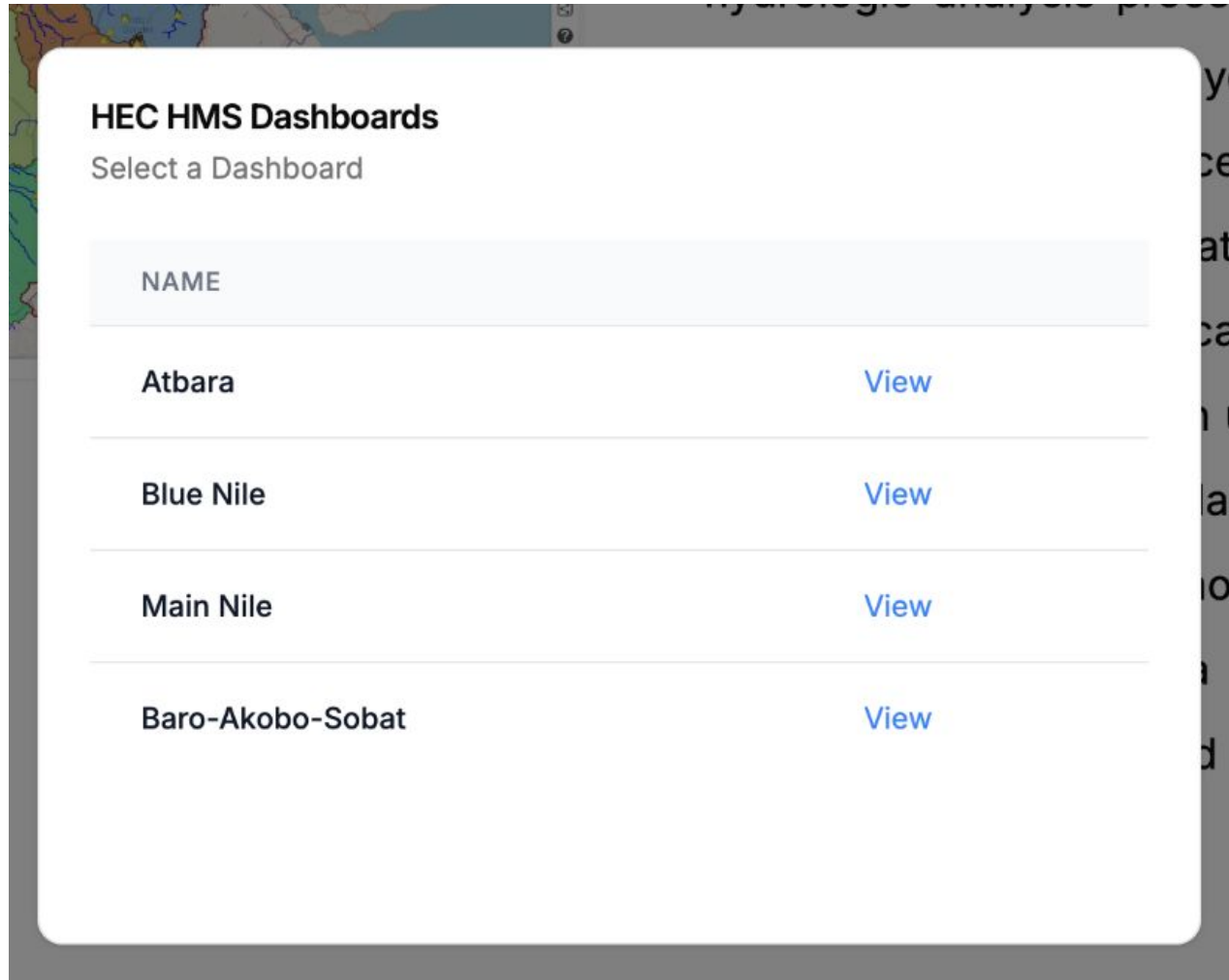
| NAME             | VERSION | ACTION                   |
|------------------|---------|--------------------------|
| Atbara           | v1.0    | <a href="#">Download</a> |
| Blue Nile        | v1.0    | <a href="#">Download</a> |
| Main Nile        | v1.0    | <a href="#">Download</a> |
| BARO AKOBO SOBAT | v1.0    | <a href="#">Download</a> |

- ❖ **HEC-HMS - short description (A link is provided to see the details)**  
<https://www.hec.usace.army.mil/software/hec-hms/>
  - Get Data
  - Download Models
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    - **Atbara Basin HMS Results and Atbara sub-catchments**
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    - **Blue Nile Basin HMS Results and Blue Nile sub-catchments**
    - **Baro-Akobo\_Sobat Basin HMS Results and Baro-Akobo-Sobat sub-catchments**



# Sub sections: EN-Hydrological and hydraulics models:

## HEC-HMS Dashboards




- ❖ **HEC-HMS - short description (A link is provided to see the details)**  
<https://www.hec.usace.army.mil/software/hec-hms/>
  - Get Data
  - Download Models
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    - **Atbara Basin HMS Results and Atbara sub-catchments**
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    - **Blue Nile Basin HMS Results and Blue Nile sub-catchments**
    - **Baro-Akobo\_Sobat Basin HMS Results and Baro-Akobo-Sobat sub-catchments**



# Sub sections: EN-Hydrological and hydraulics models:

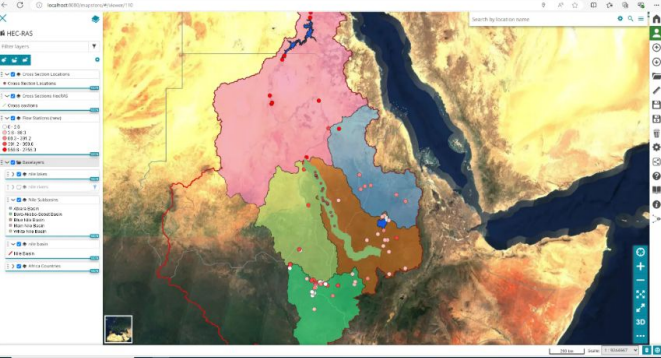
## HEC-RAS

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INITIATIVE DU BASSIN DU NIL

EN-WRMT

HOME ABOUT EN-WRMT MODELS & TOOLS LINKS & RESOURCES CONTACT US Logout

### EN HEC-RAS



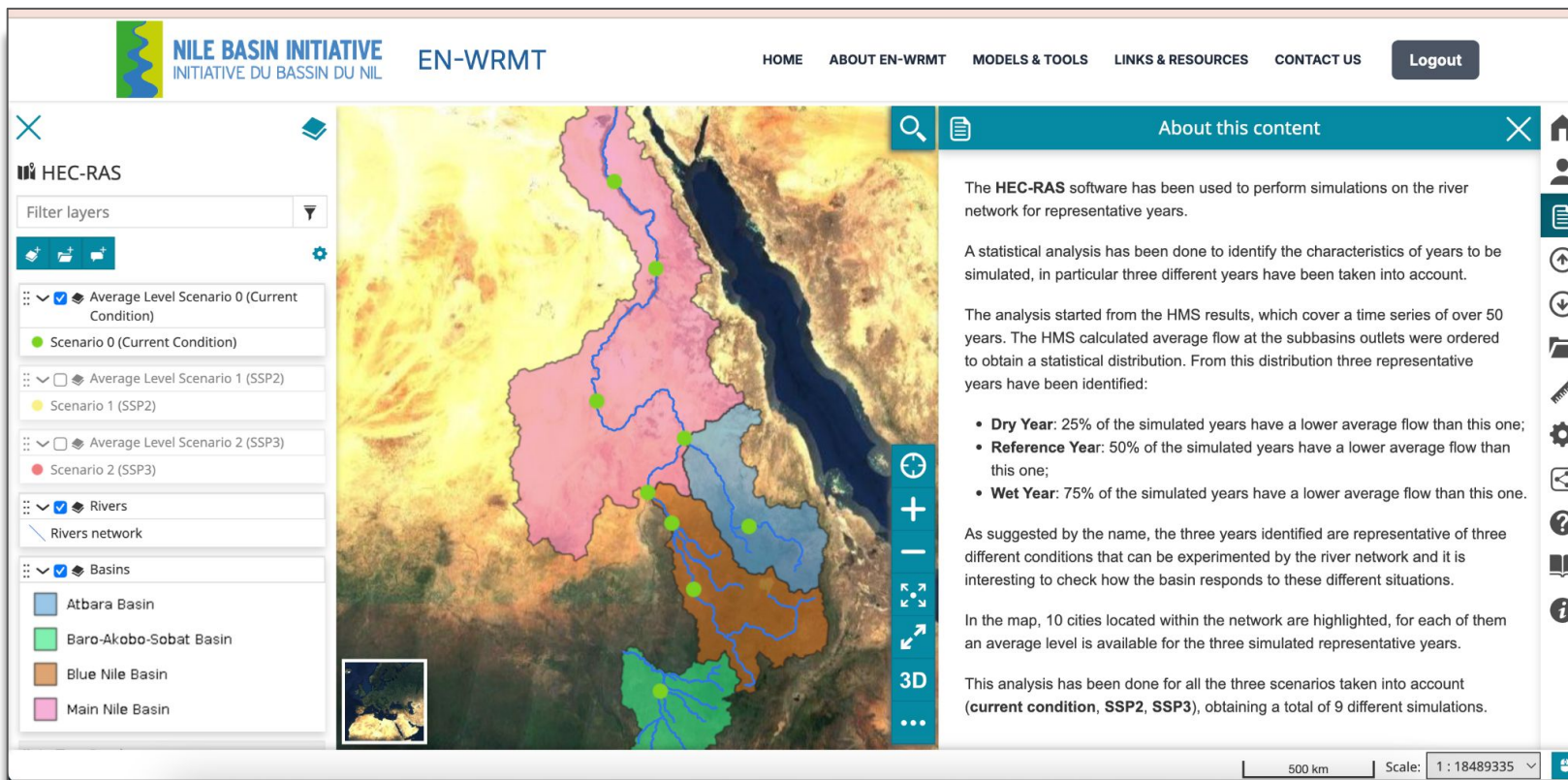
It is the Hydrologic Engineering Center's River Analysis System (HEC-RAS). This software allows the user to perform one-dimensional steady flow, one and two-dimensional unsteady flow calculations, sediment transport/mobile bed computations, and water temperature/water quality modeling. [Read More](#)

Go To Map

- ❖ **HEC-RAS - short description (A link is provided to see the details)**
  - **Go To Map** (It takes the users to the WebGIS Maps of
    - Average water level** **Average level [m a.s.l.] for a dry year,**
    - Average level [m a.s.l.] for a reference year, and**
    - Average level [m a.s.l.] for a wet year**
  - **Average Level Scenario 0 (Current Condition)**
  - **Average Level Scenario 1 (SSP2)**
  - **Average Level Scenario 2 (SSP3)**
  - **Rivers- Rivers network**

# Sub sections: EN-Hydrological and hydraulics models:

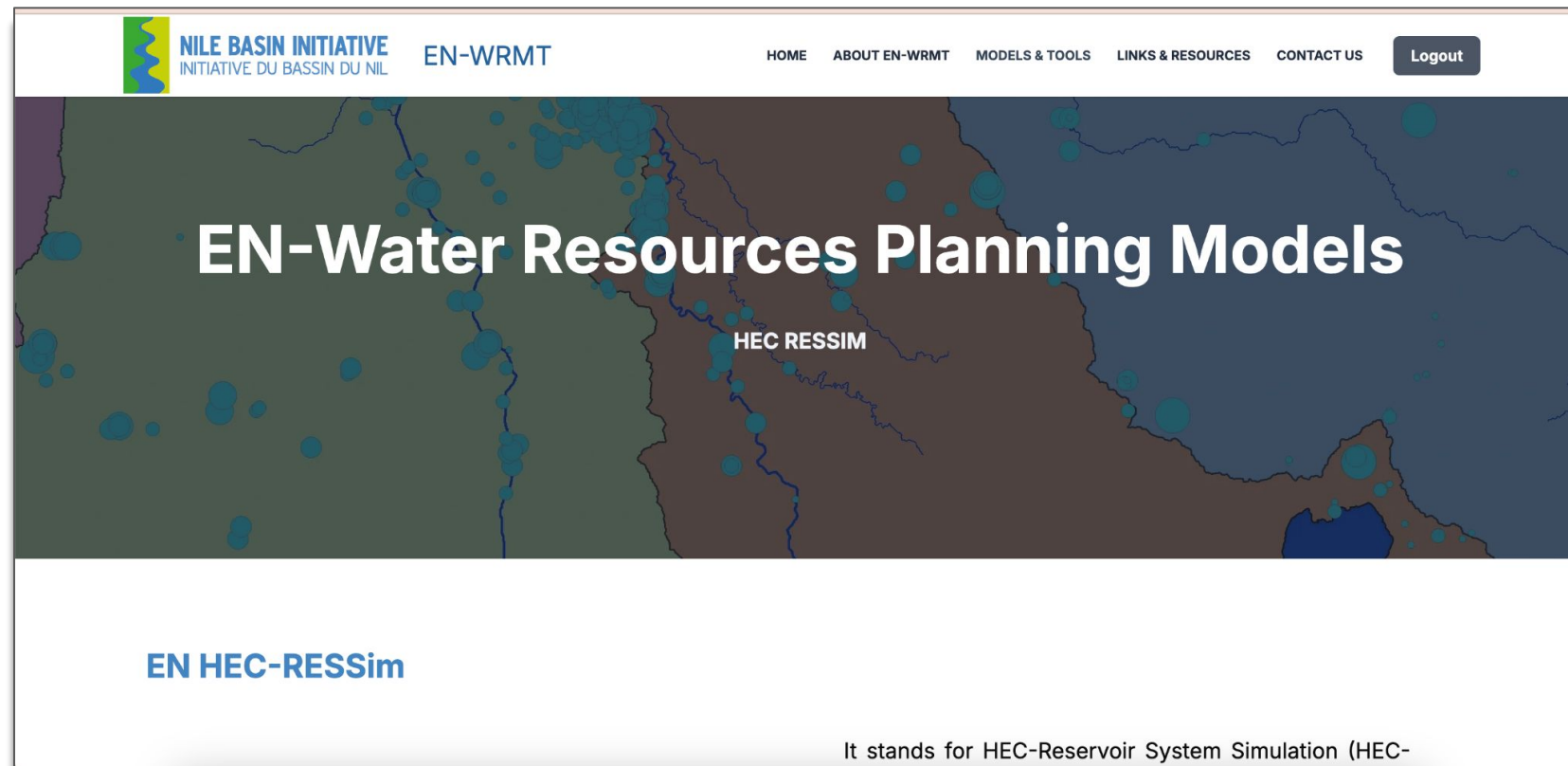
## HEC-RAS



- ❖ **HEC-RAS - short description (A link is provided to see the details)**
- **Go To Map** (It takes the users to the WebGIS Maps of
- Average water level**
- Average level [m a.s.l.] for a dry year,**
- Average level [m a.s.l.] for a reference year, and**
- Average level [m a.s.l.] for a wet year**
- **Average Level Scenario 0 (Current Condition)**
- **Average Level Scenario 1 (SSP2)**
- **Average Level Scenario 2 (SSP3)**
- **Rivers- Rivers network**

# Sub sections: EN-Water Resources Planning Models

## HEC-RESSIM



The screenshot shows the website for the Nile Basin Initiative's EN-Water Resources Planning Models. The header includes the Nile Basin Initiative logo, the text "EN-WRMT", and navigation links: HOME, ABOUT EN-WRMT, MODELS & TOOLS, LINKS & RESOURCES, CONTACT US, and a Logout button. The main banner features a map of the Nile basin with the text "EN-Water Resources Planning Models" and "HEC RESSIM". Below the banner, the text "EN HEC-RESSim" is displayed, followed by a description: "It stands for HEC-Reservoir System Simulation (HEC-".

❖ **HEC-RESSim- short description (A link is provided to see the details)**

- **Maps -** (It takes the users to the WebGIS Maps of HEC-RESSIM in the Existing Configuration and Future Configuration)

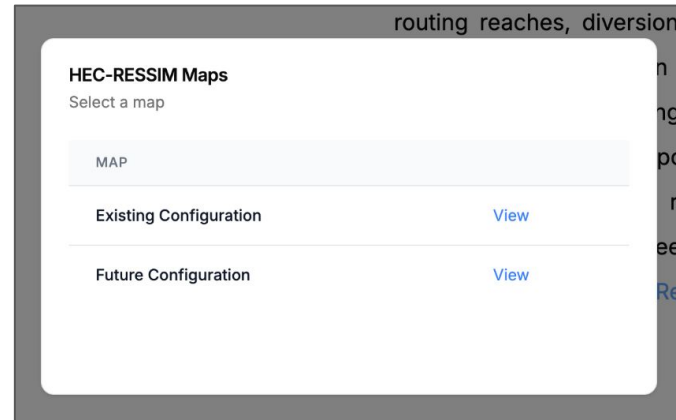
- **RESSIM Existing Configuration**  
– Point data of Existing and Rivers networks
- **RESSIM Future Configuration**  
– Point data of Future and Rivers networks



# Sub sections: EN-Water Resources Planning

## Models

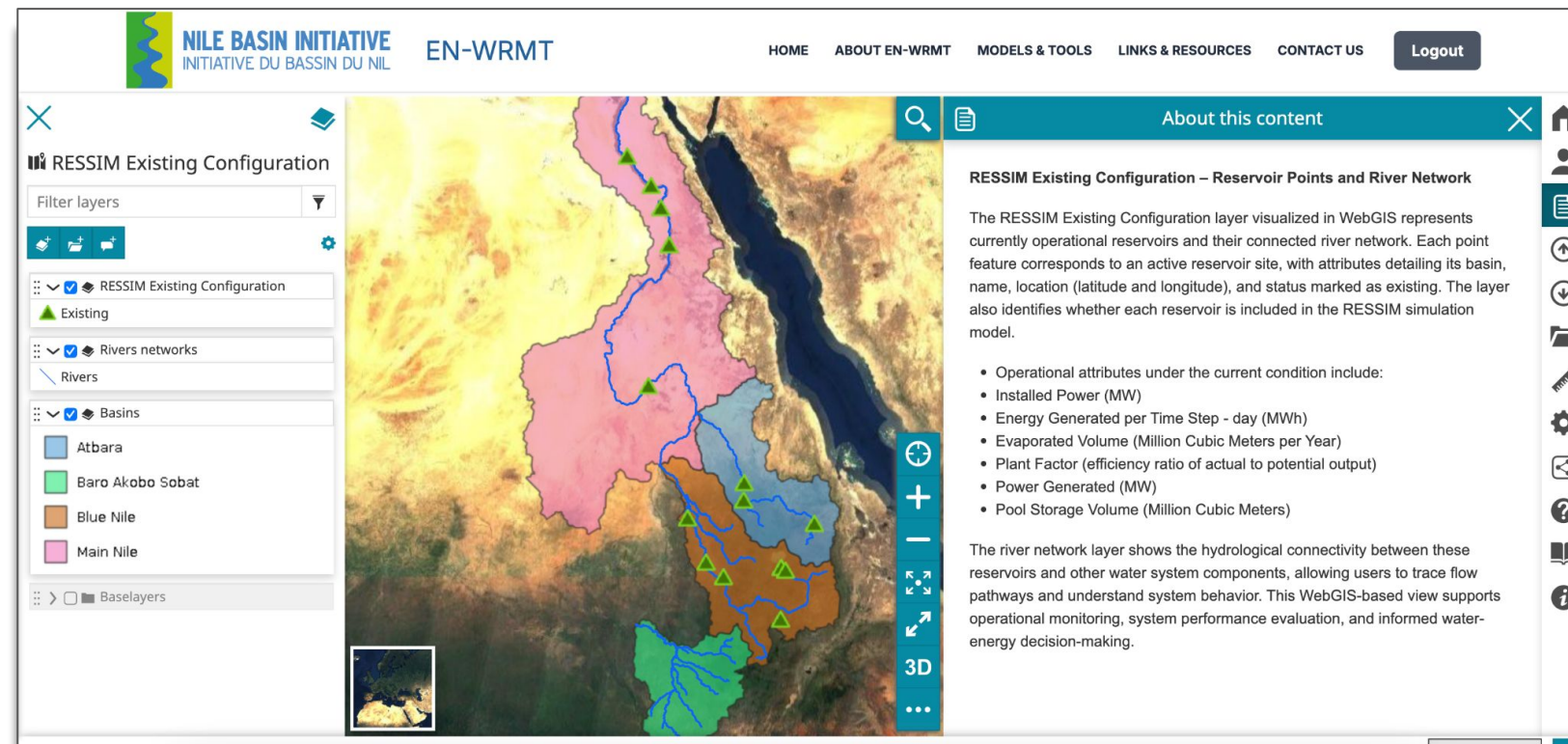
## HEC-RESSIM



- ❖ **HEC-RESSim- short description (A link is provided to see the details)**

- **Maps - (It takes the users to the WebGIS Maps of HEC-RESSIM in the Existing Configuration and Future Configuration)**

- **RESSIM Existing Configuration – Point data of Existing and Rivers networks**
- **RESSIM Future Configuration – Point data of Future and Rivers networks**

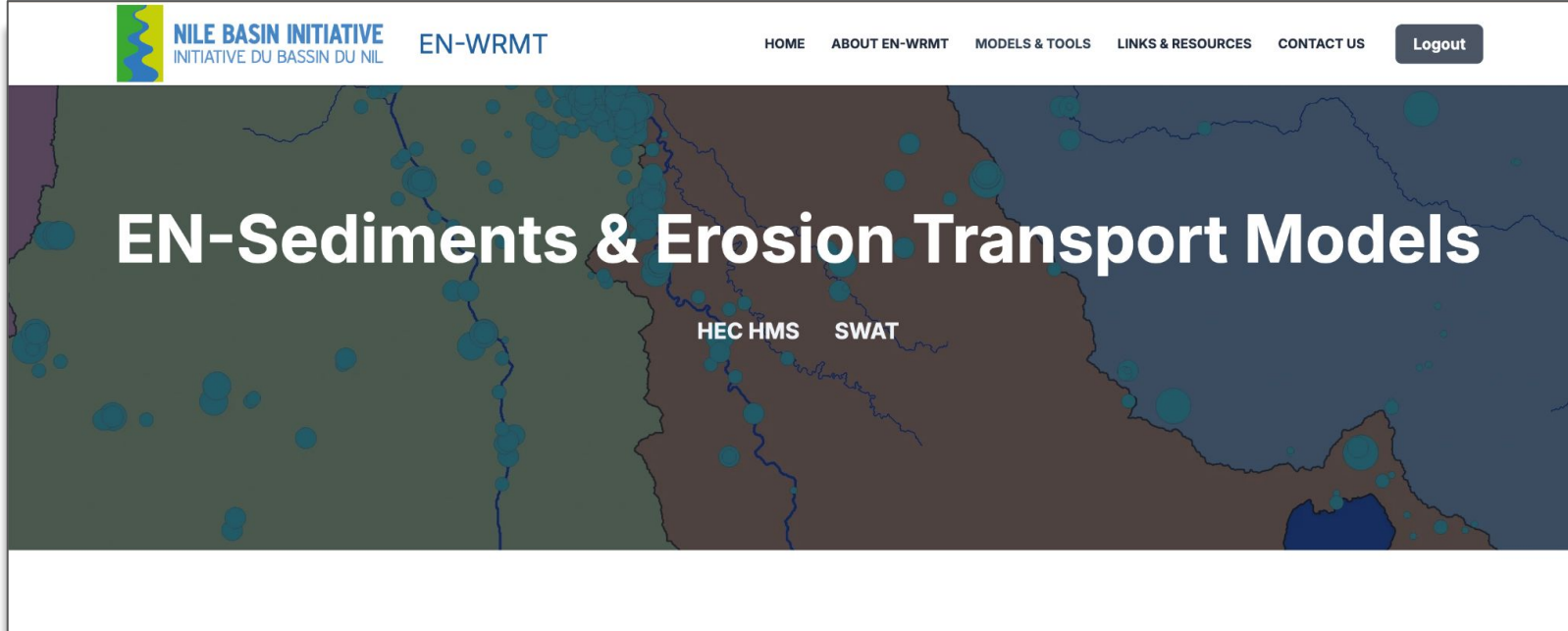




# Sub sections: EN-Sediments & Erosion Transport Models:

Sediment load, Specific sediment load, and Sediment Concentration

## HEC-HMS and SWAT



### ❖ HEC-HMS

#### ➤ Go To Map

- Atbara River Sediment, Rivers, and Atbara Basin Sediment
- Blue Nile River Sediment, Rivers, and Blue Nile Basin Sediment

### ❖ SWAT

#### ➤ Go To Map

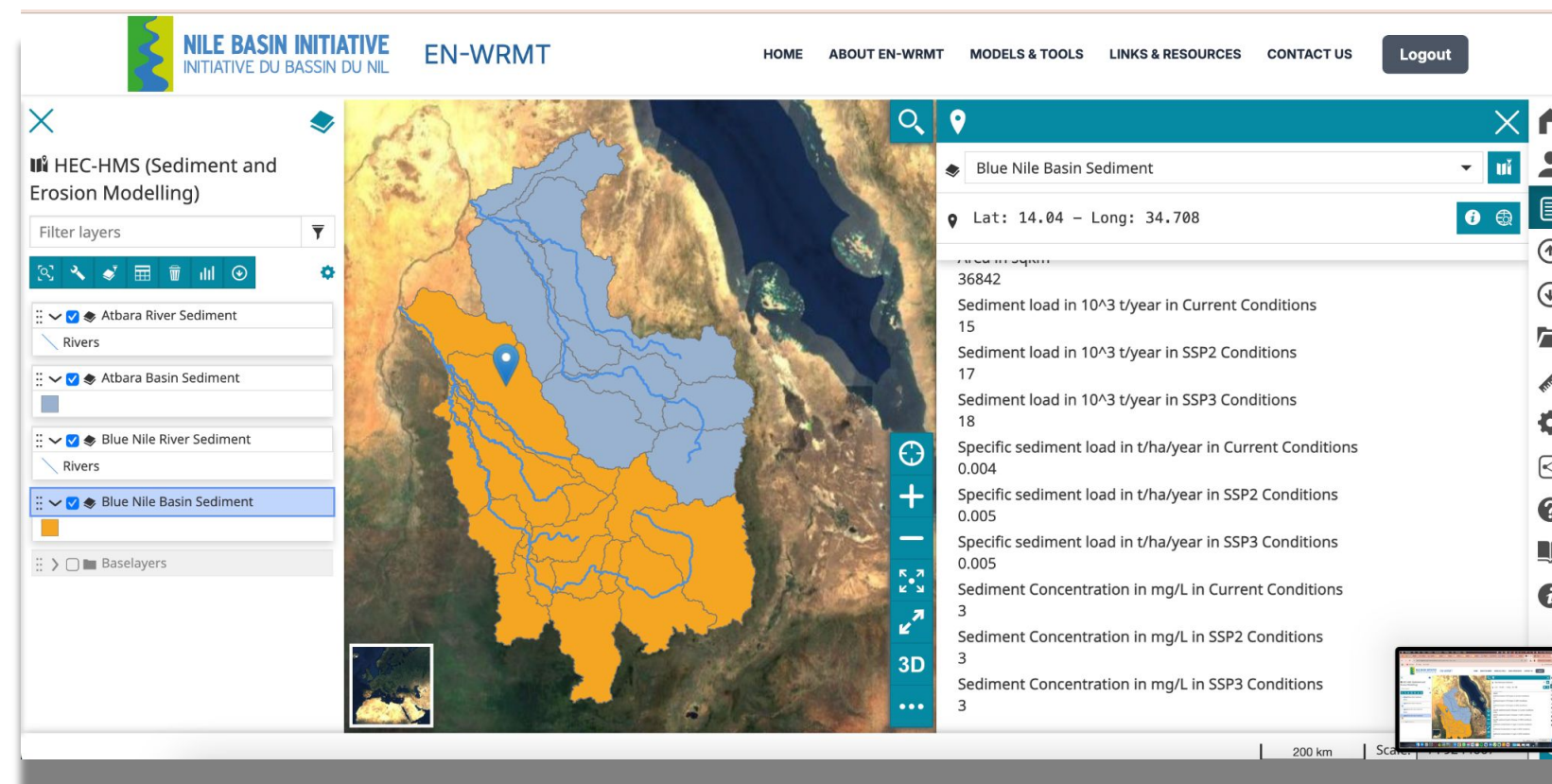
#### ➤ Scenario 0 (Current Condition), Scenario 1 (SSP2), and Scenario 2 (SSP3)

- Atbara Rivers
- Atbara Basin
- Blue Nile Rivers
- Blue Nile Basin

# Sub sections: EN-Sediments & Erosion Transport Models:

Sediment load, Specific sediment load, and Sediment Concentration

## HEC-HMS

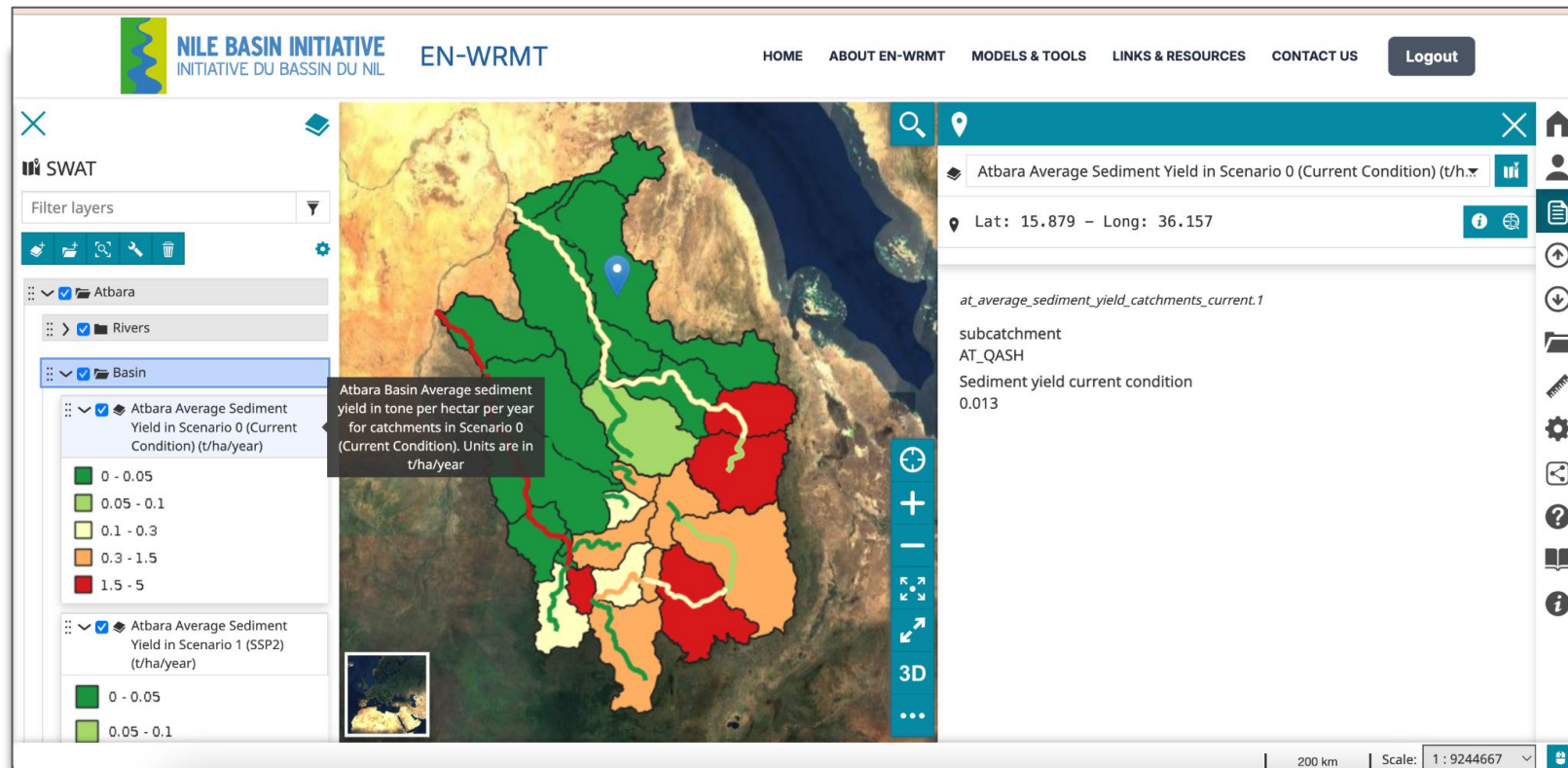


- ◆ HEC-HMS
  - Go To Map
    - Atbara River Sediment, Rivers, and Atbara Basin Sediment
    - Blue Nile River Sediment, Rivers, and Blue Nile Basin Sediment

# Sub sections: EN-Sediments & Erosion Transport Models:

Sediment load, Specific sediment load, and Sediment Concentration

## SWAT



### SWAT

- Go To Map
- Scenario 0 (Current Condition), Scenario 1 (SSP2), and Scenario 2 (SSP3)
  - Atbara Rivers
  - Atbara Basin
  - Blue Nile Rivers
  - Blue Nile Basin

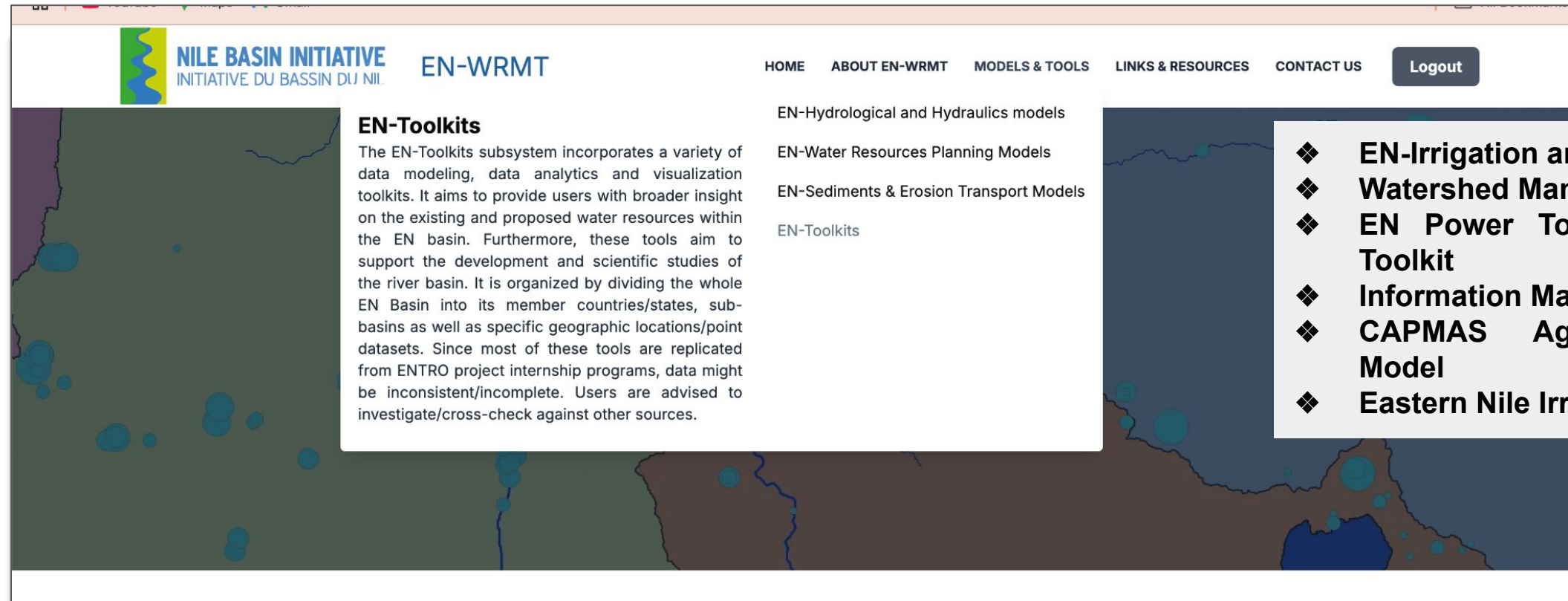


# Modified dashboard template based on the customized/ reprogrammed Map store





# Sub sections: EN-toolkits



The screenshot shows the EN-WRMT website. The header includes the Nile Basin Initiative logo and the text 'EN-WRMT'. The navigation menu contains links for HOME, ABOUT EN-WRMT, MODELS & TOOLS, LINKS & RESOURCES, CONTACT US, and a Logout button. The main content area is titled 'EN-Toolkits' and contains a paragraph describing the subsystem. To the right of the text is a list of toolkits with diamond bullet points. The background of the website features a map of the Nile basin.

**EN-Toolkits**

The EN-Toolkits subsystem incorporates a variety of data modeling, data analytics and visualization toolkits. It aims to provide users with broader insight on the existing and proposed water resources within the EN basin. Furthermore, these tools aim to support the development and scientific studies of the river basin. It is organized by dividing the whole EN Basin into its member countries/states, sub-basins as well as specific geographic locations/point datasets. Since most of these tools are replicated from ENTRO project internship programs, data might be inconsistent/incomplete. Users are advised to investigate/cross-check against other sources.

- EN-Hydrological and Hydraulics models
- EN-Water Resources Planning Models
- EN-Sediments & Erosion Transport Models
- EN-Toolkits

- ❖ EN-Irrigation and Drainage Toolkit
- ❖ Watershed Management Toolkit
- ❖ EN Power Tools and Guidelines Toolkit
- ❖ Information Management System
- ❖ CAPMAS Agriculture Database Model
- ❖ Eastern Nile Irrigation Toolkit

# Sub sections: EN-toolkits

## EN-Irrigation and Drainage Toolkit



The screenshot shows the web interface of the EN-Irrigation and Drainage Toolkit. At the top, there is a navigation bar with the NILE BASIN INITIATIVE logo, the text "INITIATIVE DU BASSIN DU NIL", and "EN-WRMT". The navigation menu includes links for HOME, ABOUT EN-WRMT, MODELS & TOOLS, LINKS & RESOURCES, CONTACT US, and a Logout button. The main heading is "EN-Irrigation and Drainage Toolkit". Below this, there is a section titled "Irrigation & Drainage Toolkits" with a sub-header "Eastern Nile Technical Regional Office (ENTRO)". A list of tools is displayed: PROJECTED SCHEMES MULTI CRITERIA ANALYSIS, IRRIGATION PROJECTS PROFILE SHEETS, IRRIGATION SCHEMES CROP WATER REQUIREMENTS & CROPPING PATTERN, and DESIGN SHEETS. To the right of the list is a globe showing the Nile basin region. A paragraph describes the toolkit's objectives: "The overall objectives are to provide solid and comprehensive profile information, crop water requirement estimates and cropping patterns for all the EN irrigation schemes (existing and projected schemes). Furthermore, it aims to assess the benefits that the investment could bring (Cost-Benefit and Multi Criteria Analysis) and present general irrigation design guidelines." At the bottom right, there is a link to the "User Guide".

- ❖ EN-Irrigation and Drainage Toolkit
- ❖ Watershed Management Toolkit
- ❖ EN Power Tools and Guidelines Toolkit
- ❖ Information Management System
- ❖ CAPMAS Agriculture Database Model
- ❖ Eastern Nile Irrigation Toolkit

# Sub sections: EN-toolkits

## Watershed Management Toolkit

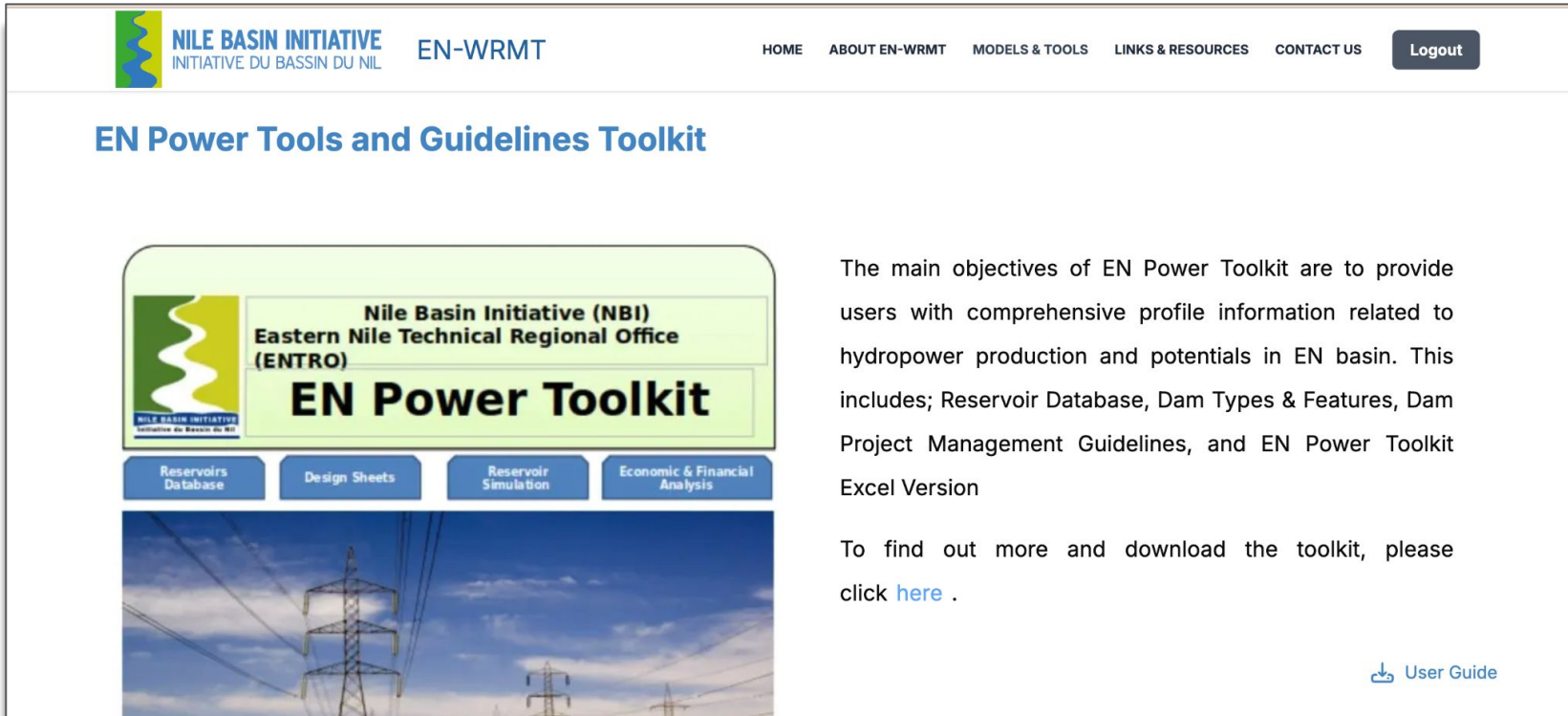


The screenshot shows the website for the EN Watershed Management Toolkit. The header includes the Nile Basin Initiative (NBI) logo, the text "ENTRO NILE BASIN INITIATIVE INITIATIVE DU BASSIN DU NIL", and "EN-WRMT". Navigation links are: HOME, ABOUT EN-WRMT, MODELS & TOOLS, LINKS & RESOURCES, CONTACT US, and a Logout button. The main heading is "Watershed Management Toolkit". Below it is a toolkit interface with a title bar "Nile Basin Initiative (NBI) Eastern Nile Technical Regional Office (ENTRO) EN Watershed Management Toolkit". The interface has five tabs: "Erosion & Sediment Analysis", "Morphological Analysis & Stream Calculations", "Watershed & BMPs", "ENWSM Knowledge Product", and "Plot WSM Interventions". Below the tabs are two images: a close-up of soil erosion with a cow in the background, and a wide view of a hilly, eroded landscape. To the right of the images, text describes the toolkit's objectives: "The overall objectives are to develop a sustainable framework for the management of the four sub-basins focusing on reducing vulnerability to shocks, enhancing sustainable livelihoods, achieving food security and alleviating poverty. The Kit Provides access to knowledge and information on WM, Simple analytical tools for erosion and sediment analysis and Guide for SWC practices for practitioners." Below this text, it says "To find out more and download the toolkit, please click [here](#) .". At the bottom right, there is a download icon and the text "User Guide".

- ❖ EN-Irrigation and Drainage Toolkit
- ❖ Watershed Management Toolkit
- ❖ EN Power Tools and Guidelines Toolkit
- ❖ Information Management System
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# Sub sections: EN-toolkits

## EN Power Tools and Guidelines Toolkit



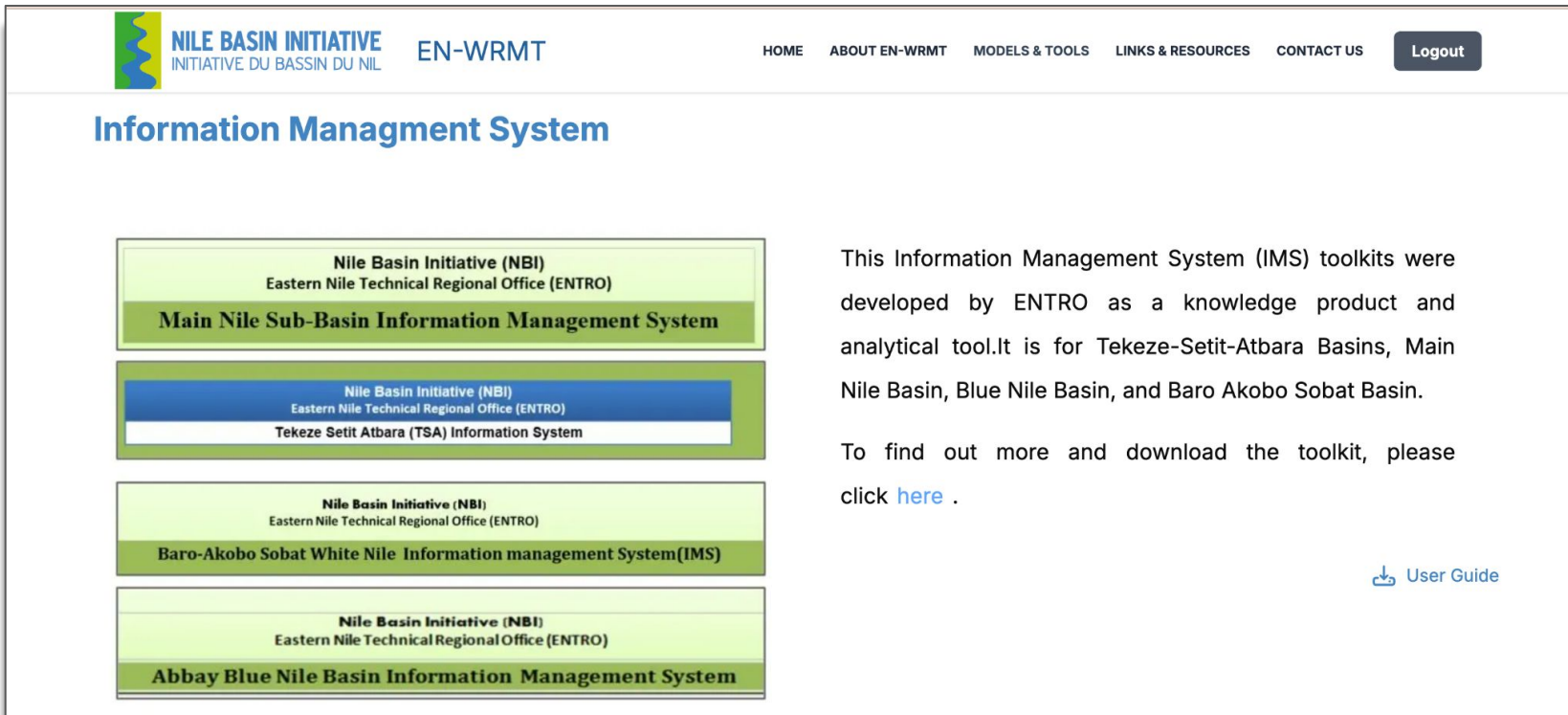
The screenshot shows the website for the EN Power Tools and Guidelines Toolkit. The header includes the Nile Basin Initiative (NBI) logo, the text "EN-WRMT", and navigation links: HOME, ABOUT EN-WRMT, MODELS & TOOLS, LINKS & RESOURCES, CONTACT US, and a Logout button. The main heading is "EN Power Tools and Guidelines Toolkit". Below this is a large green box with the NBI logo and the text "Nile Basin Initiative (NBI) Eastern Nile Technical Regional Office (ENTRO) EN Power Toolkit". Underneath the green box are four blue buttons: "Reservoirs Database", "Design Sheets", "Reservoir Simulation", and "Economic & Financial Analysis". Below these buttons is a photograph of high-voltage power lines. To the right of the image, the text states: "The main objectives of EN Power Toolkit are to provide users with comprehensive profile information related to hydropower production and potentials in EN basin. This includes; Reservoir Database, Dam Types & Features, Dam Project Management Guidelines, and EN Power Toolkit Excel Version". Below this text, it says: "To find out more and download the toolkit, please click [here](#) .". At the bottom right, there is a download icon and the text "User Guide".

- ❖ **EN-Irrigation and Drainage Toolkit**
- ❖ **Watershed Management Toolkit**
- ❖ **EN Power Tools and Guidelines Toolkit**
- ❖ **Information Management System**
- ❖ **CAPMAS Agriculture Database Model**
- ❖ **Eastern Nile Irrigation Toolkit**



# Sub sections: EN-toolkits

## Information Management System



The screenshot shows the EN-WRMT website interface. The header includes the Nile Basin Initiative logo, the text 'EN-WRMT', and navigation links: HOME, ABOUT EN-WRMT, MODELS & TOOLS, LINKS & RESOURCES, CONTACT US, and a Logout button. The main heading is 'Information Management System'. Below this, there are four boxes representing different information management systems:

- Main Nile Sub-Basin Information Management System**: Nile Basin Initiative (NBI), Eastern Nile Technical Regional Office (ENTRO)
- Tekeze Setit Atbara (TSA) Information System**: Nile Basin Initiative (NBI), Eastern Nile Technical Regional Office (ENTRO)
- Baro-Akobo Sobat White Nile Information management System(IMS)**: Nile Basin Initiative (NBI), Eastern Nile Technical Regional Office (ENTRO)
- Abbay Blue Nile Basin Information Management System**: Nile Basin Initiative (NBI), Eastern Nile Technical Regional Office (ENTRO)


To the right of these boxes, a text block states: 'This Information Management System (IMS) toolkits were developed by ENTRO as a knowledge product and analytical tool. It is for Tekeze-Setit-Atbara Basins, Main Nile Basin, Blue Nile Basin, and Baro Akobo Sobat Basin. To find out more and download the toolkit, please click [here](#) .'

At the bottom right of the text block, there is a link: [User Guide](#).

- ❖ **EN-Irrigation and Drainage Toolkit**
- ❖ **Watershed Management Toolkit**
- ❖ **EN Power Tools and Guidelines Toolkit**
- ❖ **Information Management System**
- ❖ **CAPMAS Agriculture Database Model**
- ❖ **Eastern Nile Irrigation Toolkit**

# Sub sections: EN-toolkits

## CAPMAS Agriculture Database Model


**EN-WRMT**

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[LINKS & RESOURCES](#)
[CONTACT US](#)
[Logout](#)

### CAPMAS Agriculture Database Model

**Area & Production Plants**

- Total Cultivated Area
- Crooping Area& Pro-Winter crops
- Crooping Area& Pro-summer crops
- Crooping Area&Product-Nile Crops
- Vegetables Area
- No&Area of Owen (Area Categories)
- No.&Areas-owen-Governorate

**Number & Production Animals**

- Livestock Population
- Estimated slaughtered livestock
- Estimated-Eggs& Hatchings
- Fish Production
- Haney& Wex Production
- Crude Milk Production

**Available Watersh Irrigation System**

- Available Water&Irrigation System
- Water Consumption in Agriculture

**Agri-Import&Ex**

- Agricultural Export
- Agricultural Import

**Agri-Income**

- Develop-Val-Pro&net Agri-Income
- Index Num of Agri-Sector

**Agriculture Input**

- Agriculture Production Input& Cost

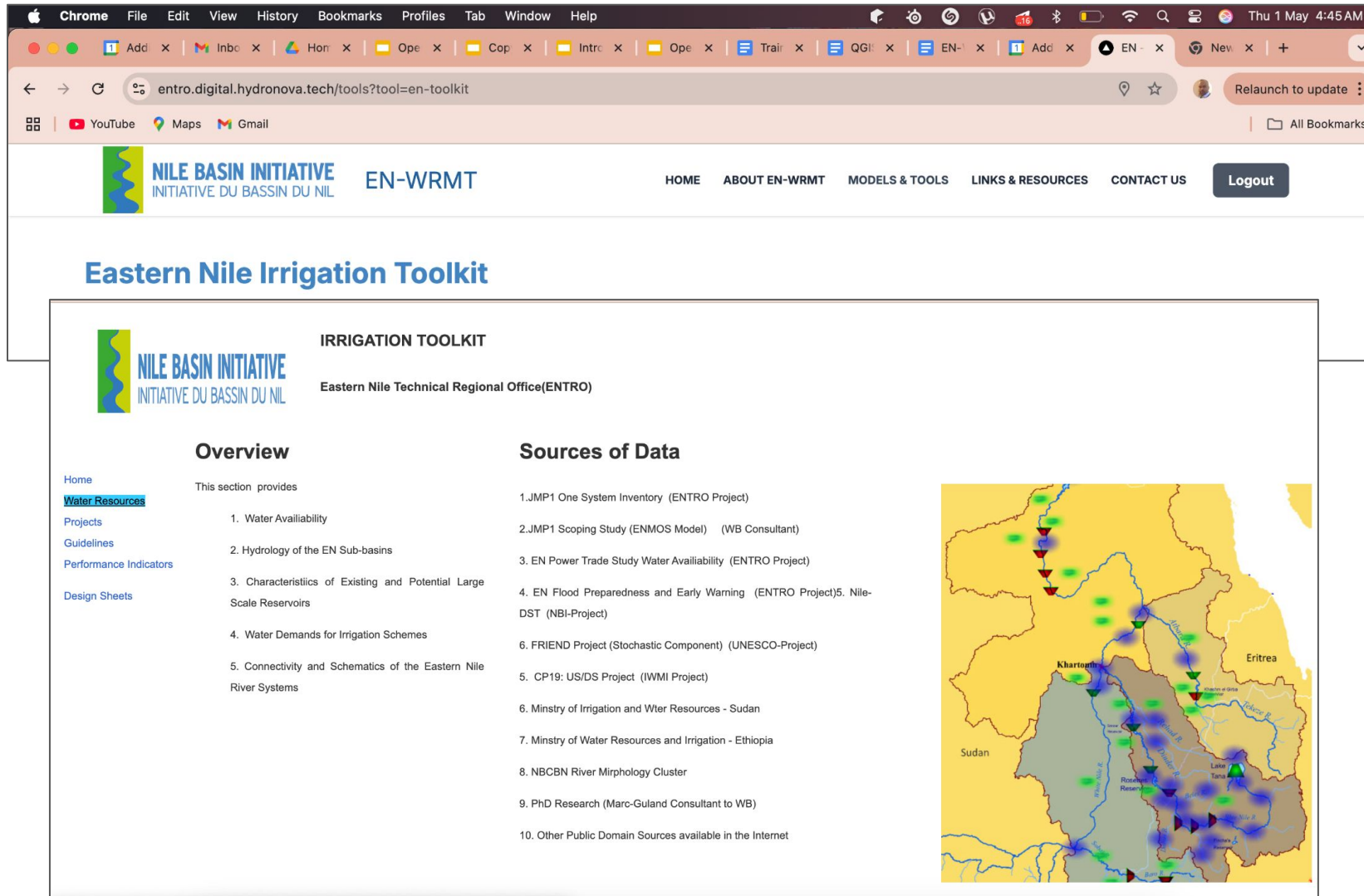
The Agricultural Statistical Agency Data Model's Structure

1. Statistical of crop areas and production plant: Data includes the size of crop and plant production (crops - vegetables - fruit)in the three lugs for oldand new lands, according to the republic governorates.
2. Irrigation and Water Resources: its includes measurement of levels and actions of the Nile, drainage projects and compare the size of cultivated land, rations of waters.
3. Livestock Statistics: Its includes estimates of the number of cattle, poultry, livestock production quantities and Insecticide.
4. Animal statistical of fish production: its includes statistical data on fish production according to species, fishing areas, months, and the value of exports and imports.
5. Estimated income from the agricultural sector : its includes data on the value of production and net farm income (plant, animal,

- ❖ **EN-Irrigation and Drainage Toolkit**
- ❖ **Watershed Management Toolkit**
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- ❖ **Eastern Nile Irrigation Toolkit**

# Sub sections: EN-toolkits


## Eastern Nile Irrigation Toolkit



The screenshot shows the web interface of the Eastern Nile Irrigation Toolkit. The browser address bar displays the URL: `entro.digital.hydronova.tech/tools?tool=en-toolkit`. The website header includes the Nile Basin Initiative logo, the text "EN-WRMT", and a navigation menu with links: HOME, ABOUT EN-WRMT, MODELS & TOOLS, LINKS & RESOURCES, CONTACT US, and a Logout button. The main content area is titled "Eastern Nile Irrigation Toolkit" and features the Nile Basin Initiative logo and the text "IRRIGATION TOOLKIT" and "Eastern Nile Technical Regional Office(ENTRO)". A sidebar on the left contains a "Home" link and a "Water Resources" link. The main content is divided into two columns: "Overview" and "Sources of Data". The "Overview" column lists five items: 1. Water Availability, 2. Hydrology of the EN Sub-basins, 3. Characteristics of Existing and Potential Large Scale Reservoirs, 4. Water Demands for Irrigation Schemes, and 5. Connectivity and Schematics of the Eastern Nile River Systems. The "Sources of Data" column lists ten items: 1. JMP1 One System Inventory (ENTRO Project), 2. JMP1 Scoping Study (ENMOS Model) (WB Consultant), 3. EN Power Trade Study Water Availability (ENTRO Project), 4. EN Flood Preparedness and Early Warning (ENTRO Project), 5. Nile-DST (NBI-Project), 6. FRIEND Project (Stochastic Component) (UNESCO-Project), 7. CP19: US/DS Project (IWMI Project), 8. Ministry of Irrigation and Water Resources - Sudan, 9. Ministry of Water Resources and Irrigation - Ethiopia, 10. NBCBN River Morphology Cluster, 11. PhD Research (Marc-Guland Consultant to WB), and 12. Other Public Domain Sources available in the Internet. A map of the Eastern Nile region is displayed on the right side of the "Sources of Data" column, showing the Nile River and its tributaries, with labels for Sudan, Eritrea, Lake Tana, and Khartoum.

- ❖ EN-Irrigation and Drainage Toolkit
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# Links and Resources Section



**NILE BASIN INITIATIVE**  
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## EN Models

EN-Hydrological and Hydraulics models

- > EN HEC-DSSVue
- > EN HEC-RAS
- > EN HEC-HMS

EN-Water Resources Planning Models

- > EN HEC-RESSim

EN-Sediments & Erosion Transport Models

- > EN HEC-HMS
- > EN SWAT

## EN-Toolkits

- > EN-Irrigation and Drainage Toolkit
- > Watershed Management Toolkit
- > EN Power Tools and Guidelines Toolkit
- > Information Management System
- > CAPMAS Agriculture Database Model
- > Eastern Nile Irrigation Toolkit

## EN-WRMT Training Programs (TPs)

TP1: Hydrological and Hydraulics Models Development

DSS-Vue

Recordings

Day 1

Part 1
Part 2

Day 2

Part 1
Part 2

Training Materials

Exercise Day 1
Exercise Day 2
Presentations
BearValley
DSS Training
Entering Nile Data Example

QGIS

Recordings

Day 1


Part 1
Part 2

Day 2

Part 1



# Forum Section



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