

Experimental Water Information Interface Webpage Product Description Document 8/28/19

Part I – Mission Connection

a. Product Description –

Effective on Tuesday, August 16, 2016, the Office of Water Prediction (OWP) National Water Center (NWC) began hosting water information from the National Water Model (NWM), which is an hourly, uncoupled hydrologic analysis and forecast system that provides streamflow for 2.7 million river reaches and other hydrologic information on 1 km and 250 m grids, on its Experimental Water Information Interface Webpage. The webpage can be found at <https://water.noaa.gov/map>.

b. Purpose –

The Experimental Water Information Interface Web page is a mapping interface which allows users to display a range of water information, such as snow depth; snow water equivalent; and the NWM output, including streamflow, streamflow anomaly, soil saturation images, and forecast hydrographs for 2.7 million river reaches for short-, medium-, and long-forecast ranges for the contiguous United States and Hawaii. A topographic map with NWM flowlines appears when the Experimental Water Information Interface Web page is first displayed (Figure 1).



Figure 1. Experimental Water Information Interface Webpage

Interactive Forecast Chart

Use the “+” zoom-in button in the upper left-hand portion of the webpage to zoom into your area of interest to more precisely identify a particular river reach. Click on the map to select a river reach. In this case, the Ohio River at Louisville has been selected and is highlighted in yellow (Figure 2).

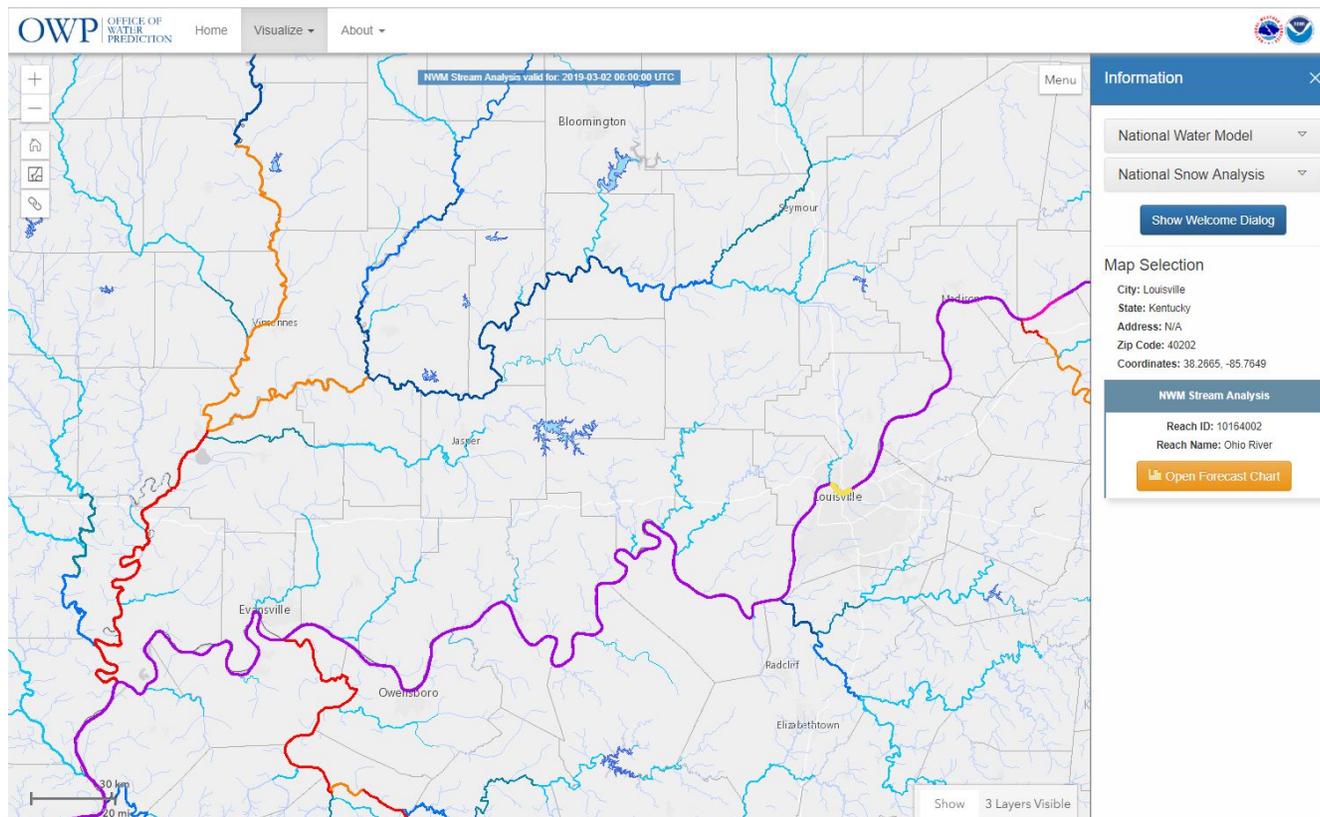


Figure 2. User-selected river reach on the Experimental Water Information Interface Webpage

The Information section to the right of the map shows additional information about your map selection, including city, state, address, zip code, coordinates, reach ID, and reach name.

Click on the Open Forecast Chart button to display a forecast hydrograph for your selected river reach (Figure 3). A hydrograph is a graph showing the rate of flow versus time past a specific point in a river.

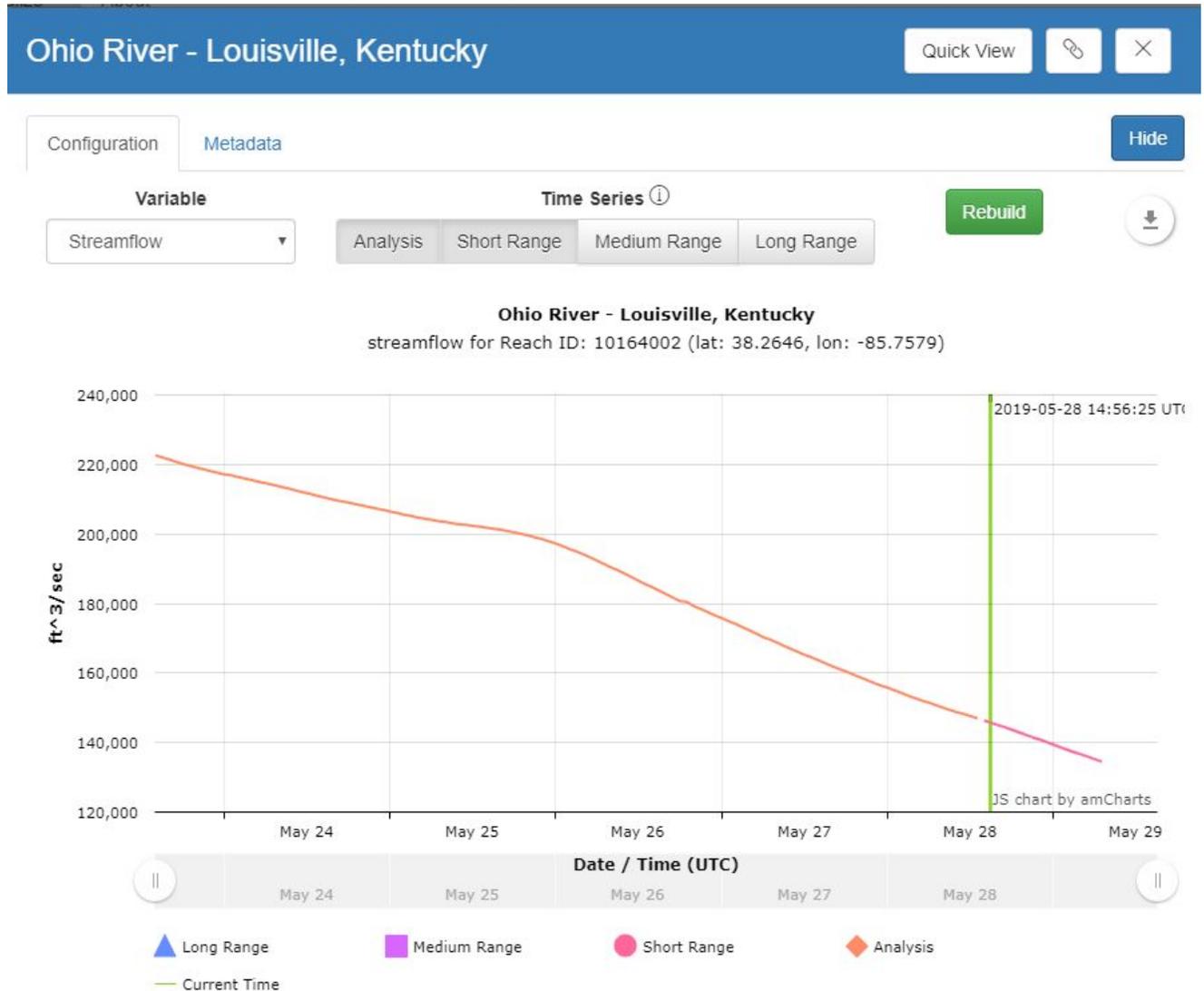


Figure 3. Experimental Interactive Forecast Chart depicting a short-range, forecast hydrograph for a user-selected river reach.

On the Experimental Interactive Forecast Chart (Configuration tab), users have the option of displaying short-range (18-hour), medium-range (10-day), and long-range (30-day) forecast hydrographs. Users can display fewer forecasts on the hydrograph by adjusting the time control buttons below the time axis. Clicking the download button on the upper right will allow a user to select Download as, Save as, Annotate, or Print from the dropdown menu. Clicking Download as gives the user the option to save the hydrograph as a PNG, JPG, SVG, or PDF. Selecting Save as gives the user the option to download the underlying time series information in CSV, XLSX, or JSON formats. Selecting Annotate brings up options for marking up the document by selecting Add, Change, Download as, Print, or Cancel. Selecting Add allows the user to add Shape or Text to the hydrograph image. Clicking Change allows the user to change Mode, annotating as Pencil, Line, or Arrow, and the Color and Opacity of the annotation. From this menu, users may also Undo or Redo the last

annotation. Download as gives the user the option to save the annotated hydrograph as a PNG, JPG, SVG, or PDF. Selecting Print brings up a full screen annotated hydrograph and the system print menu. Selecting Cancel will return the user to the main hydrograph view. Clicking Print on download button dropdown menu from the main hydrograph view brings up a full screen hydrograph and the system print menu. Metadata pertaining to the selected river reach and the streamflow forecast at that location is available via the Metadata tab. The Permalink button copies a permalink to the user's clipboard while the Quickview link at the top right copies a permalink to the hydrograph and opens the Forecast Chart Quick View page.

Experimental NWM Image Viewer

Images from the NWM for various time periods are available by clicking on the Visualize drop-down menu at the top of the Experimental Water Information Interface Webpage and selecting the Experimental Image Viewer.

From the Dataset drop-down menu, users can choose to view:

- Streamflow (Figure 4)
- Streamflow Anomaly (Figure 5)
- Near-Surface Soil Moisture (Figure 6)
- Precipitation (Figure 7)

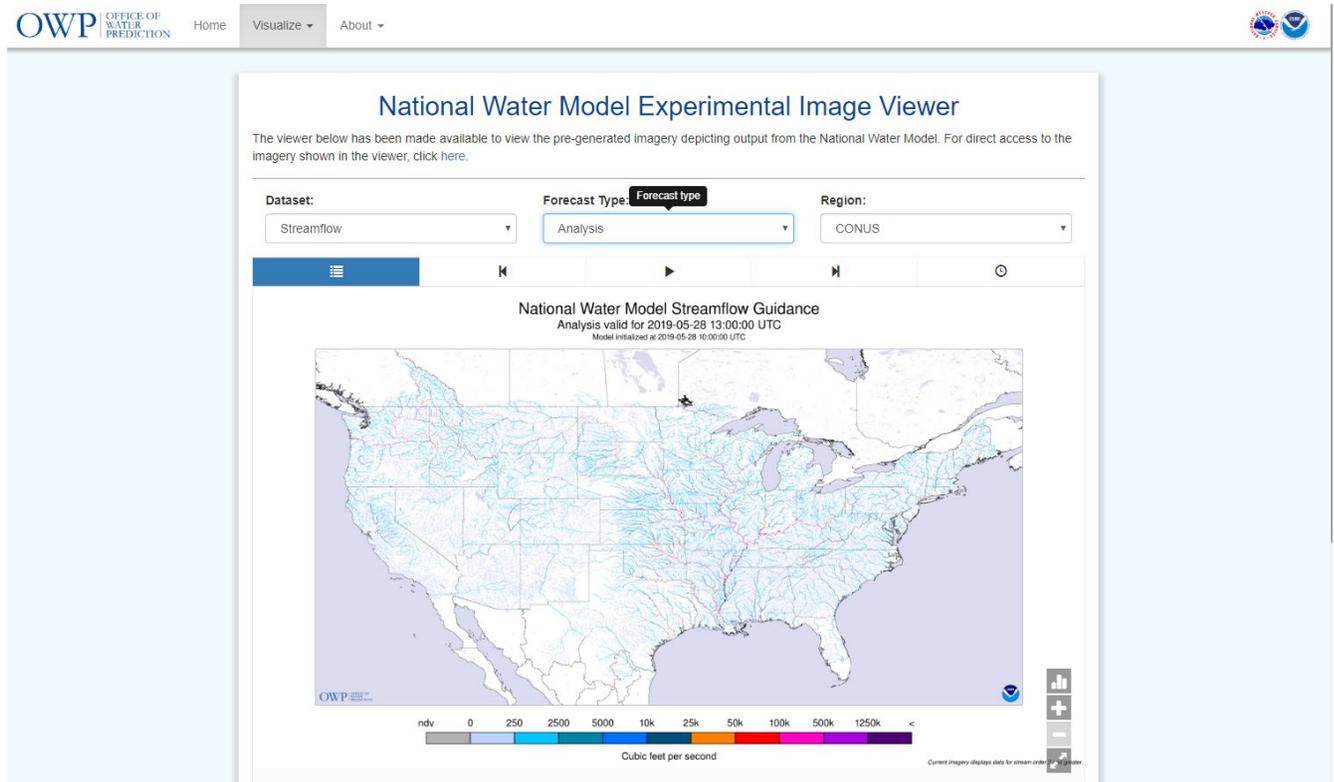


Figure 4. Experimental NWM Image Viewer – Streamflow Analysis Guidance for the contiguous United States

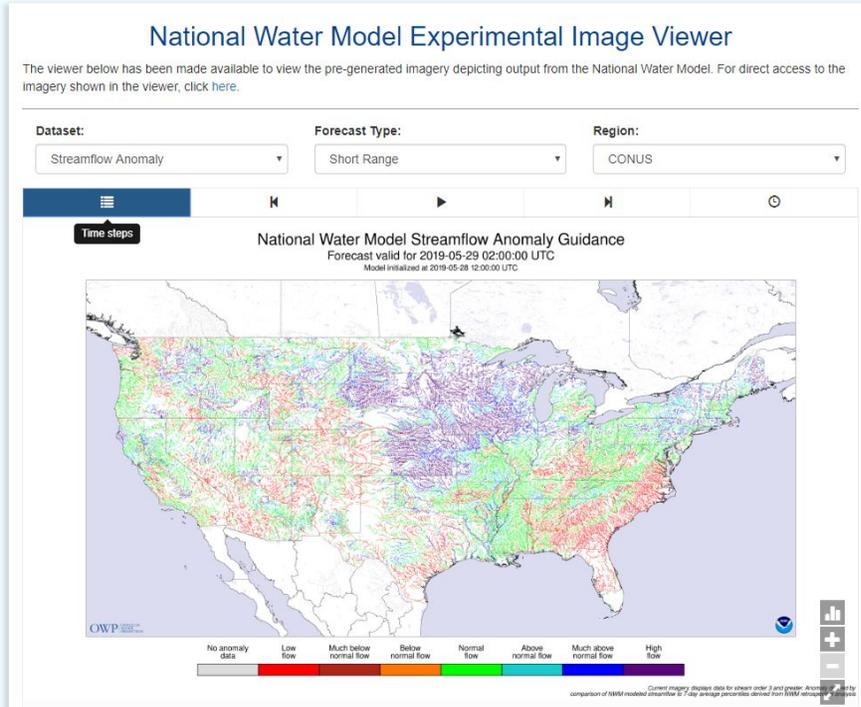


Figure 5. Experimental NWM Image Viewer – Short-Range, Streamflow Anomaly Guidance for the contiguous US

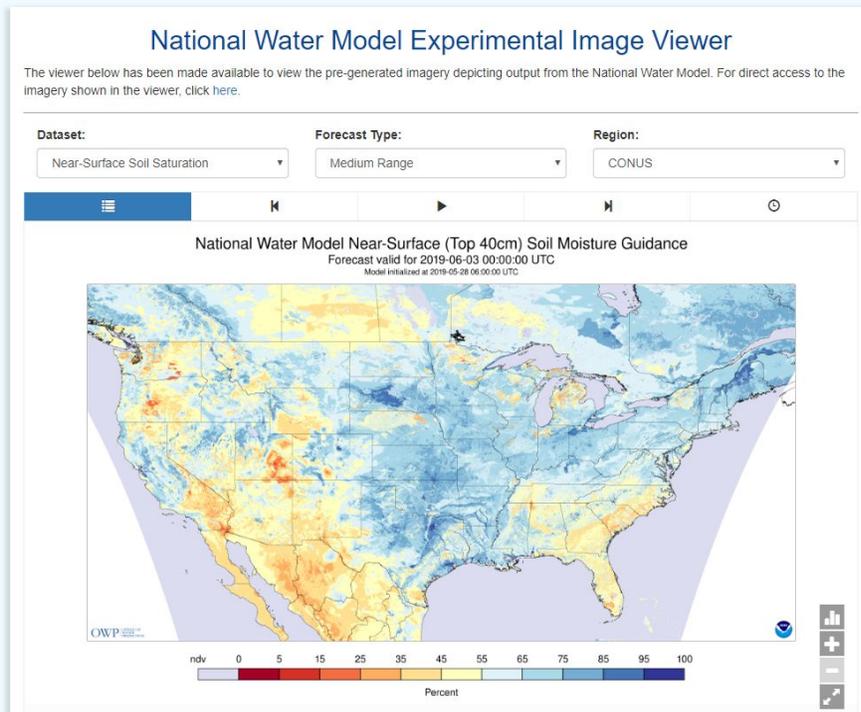


Figure 6. Experimental NWM Image Viewer – Medium-Range, Near-Surface Soil Moisture Guidance for the contiguous United States

National Water Model Experimental Image Viewer

The viewer below has been made available to view the pre-generated imagery depicting output from the National Water Model. For direct access to the imagery shown in the viewer, click [here](#).

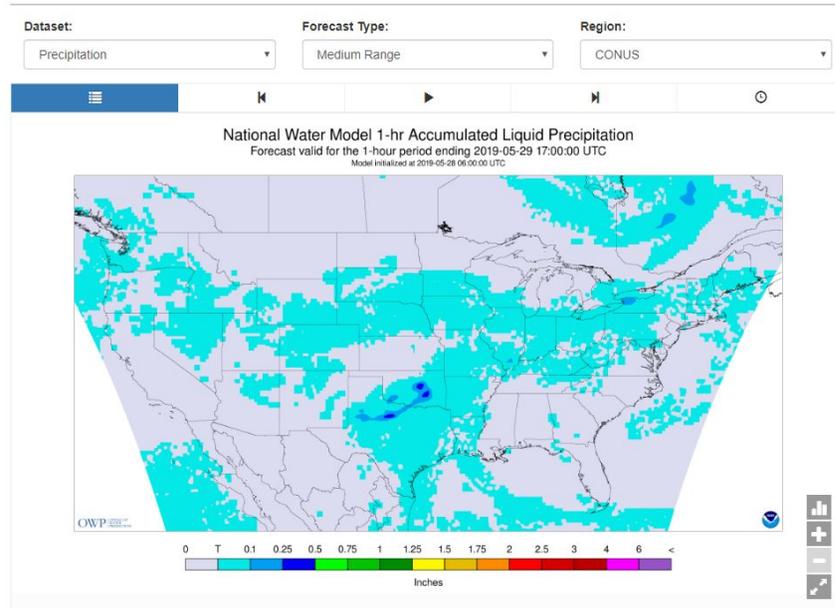


Figure 7. Experimental NWM Image Viewer - Medium Range, Precipitation Guidance for the contiguous US

From the Forecast Type drop-down menu, users can choose:

- Analysis to display a real-time snapshot of the selected dataset
- Short-Range to display 18-hour deterministic (single value) guidance
- Medium-Range to display 10-day deterministic (single value) guidance
- Long-Range to display 30-day ensemble guidance

From the Region drop-down menu, users can choose:

- CONUS to display a map of the contiguous United States
- Hawaii to display a map of Hawaii

If the Hawaii regional view is chosen, Streamflow Anomaly is no longer an option under the Dataset dropdown and Forecast Type becomes limited to:

- Analysis to display a real-time snapshot of the selected dataset (Figure 8)
- Short-Range to display 60-hour deterministic (single value) guidance (Figure 9)

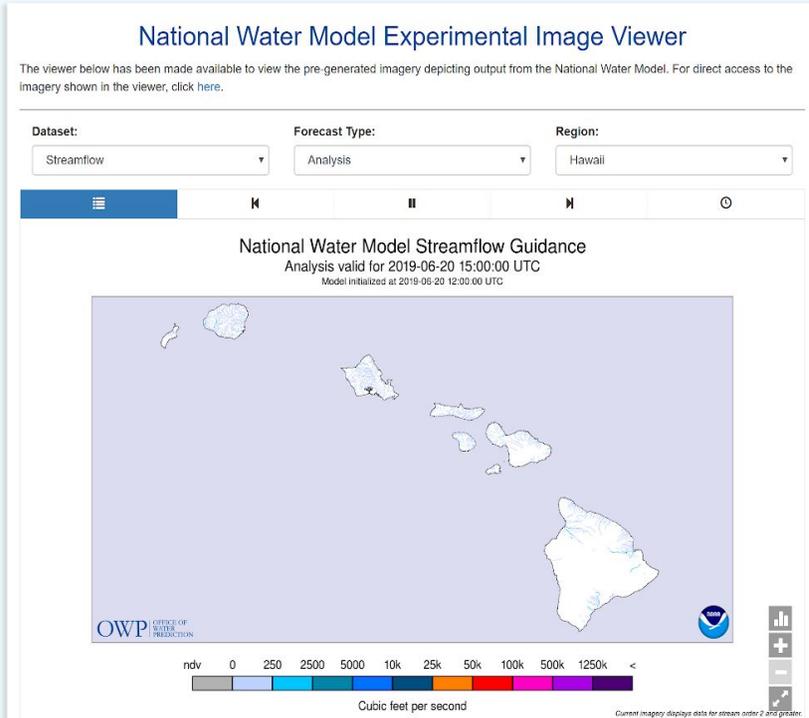


Figure 8. Experimental NWM Image Viewer - Streamflow Analysis Guidance for Hawaii

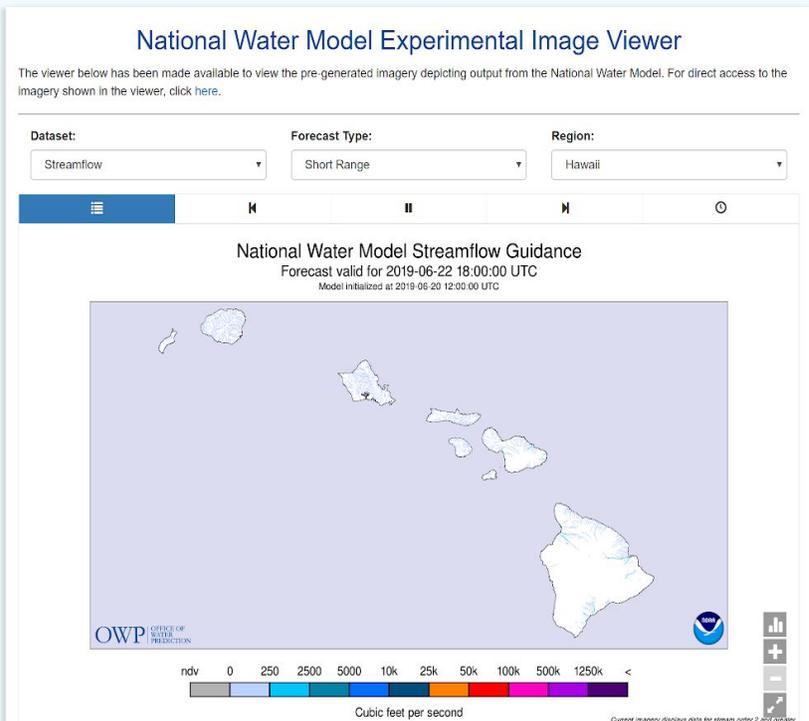


Figure 9. Experimental NWM Image Viewer - Short-Range, Streamflow Guidance for Hawaii

Use the buttons and slider control above the map to:

- Display an image at a particular time
- Stop/start the looping of images
- Loop images forward/backward in time
- Control the looping speed

Regardless of the view options chosen, at the lower right-hand corner of the map, people can use the zoom control “+” and “-” buttons for changing the zoom level of the map or to display the map in full screen and the legend control button to increase/decrease the size of the map legend or toggle it on and off.

Experimental Water Information Interface Mapping Controls

The upper left-hand portion of the webpage includes zoom, default extent, and inset map controls as well as a button to permalink the current map view. The zoom control consists of “+” and “-” buttons for changing the zoom level of the map. Clicking the default extent button sets the map extent to what was initially shown when the webpage was first displayed. The Permalink map view button copies a permalink of the current map view extent to the user’s clipboard. The Inset Map button toggles on and off the lower left inset map.

The upper right-hand portion of the webpage displays the Menu button. Under the Menu dropdown menu, Help, Basemaps, Show/Hide Data Time, Downloads, Information, Legends, and Location Search are available. Clicking on Help displays information on the main menu, reach selection, and layer list. Clicking Basemaps allows users to display water information with 7 types of base maps, including Topographic, United States Geological Survey (USGS) topographic, Delorme, Streets, Dark Grey, Light Grey, and Imagery with Labels maps. Clicking the Show/Hide Data Time button toggles on or off the valid time displayed at the top of the map. Clicking the Downloads button allows users to download National Snow Analysis (NSA) regions data in Keyhole Markup language Zipped (KMZ) format. Selecting the Information button displays information on the NWM and allows users to view snow statistics for 18 regions. The map legend is displayed by clicking on the Legends button. Selecting the Location Search button displays the Navigation controls. Users can search for a particular location by address or coordinate or quickly navigate to a specific geographic region.

The lower right-hand portion of the webpage includes Map Layer control. Users can toggle various types of NWM Lakes and Reservoirs and NWM Stream Analysis layers off and on. Clicking on the Layers Info button provides descriptions of the various types of layers that are available for display. Users can click on the New Layer button to add layers to the map.

c. Audience –

Users include National Weather Service (NWS) River Forecast Centers (RFCs) and Weather Forecast Offices (WFOs), NWS regions, National Centers for Environmental Prediction (NCEP) centers, USGS, Environmental Protection Agency (EPA), Federal Emergency Management Agency (FEMA), U.S. Army Corps of Engineers (USACE), National Aeronautics and Space Administration (NASA), United States Bureau of Reclamation (USBR), state agencies, local and regional emergency responders, the National Ocean Service (NOS), National Integrated Drought Information System (NIDIS), academia and private industry.

d. Presentation Format –

Users will be able to view water information on the Experimental Water Information Interface Webpage at <https://water.noaa.gov/map>.

All NWM output will be stored in NetCDF format in one of three file types:

- 1) 1km gridded NetCDF (land surface variables and forcing)
- 2) 250m gridded NetCDF (ponded water depth and depth to soil saturation)
- 3) Point-type NetCDF (stream routing and reservoir variables)

The two gridded file types are used for two separate rectangular domains, 1) the CONUS+ (roughly from 19N to 58N) and 2) the Hawaiian Islands, while the point NetCDF file type is used for the CONUS (including adjacent hydrologically contributing areas) and the Hawaiian Islands.

The full set of NWM output data and a subset of forcing files is available on the NOAA Operational Model Archive and Distribution System (NOMADS) and the National Centers for Environmental Prediction (NCEP) FTP server at:

<https://nomads.ncep.noaa.gov/pub/data/nccf/com/nwm>
<ftp://ftpprd.ncep.noaa.gov/pub/data/nccf/com/nwm>

e. Feedback Method –

The OWP NWC is always seeking to improve the availability and quality of its products and services based on user feedback. Comments regarding the Experimental Water Information Interface Webpage should be provided by December 31, 2019, through the electronic survey via the link provided below:

<https://www.surveymonkey.com/r/ExpWaterInformationInterfaceWebpage>

Comments may also be submitted to the NWM Implementation Project Manager at Brian.Cosgrove@noaa.gov.

Part II – Technical Description

a. Format and Science Basis –

Detailed technical information about the NWM, including NWM operational configuration, model details, general framework, analysis and assimilation, forecast ranges, and output is available at <https://water.noaa.gov/about/nwm>.

b. Product Availability –

End users will be able to view water information via the Experimental Water Information Interface Webpage at <https://water.noaa.gov/map>.

c. Additional Information - None