



# California GIS Council Progress Report

<b>Workgroup: National Hydrography Dataset (NHD)</b> Workgroup page*: <a href="http://cgia.org/cagiscouncil/workgroups/hydrography/">http://cgia.org/cagiscouncil/workgroups/hydrography/</a> Workgroup Chair: Jane Schafer-Kramer ( <a href="mailto:jane.schafer-kramer@water.ca.gov">jane.schafer-kramer@water.ca.gov</a> ) NHD pages on the CNRA Open Data site: <a href="https://data.cnra.ca.gov/dataset/national-hydrography-dataset-nhd">https://data.cnra.ca.gov/dataset/national-hydrography-dataset-nhd</a> and <b>New!</b> <a href="https://data.cnra.ca.gov/dataset/nhd-major-features">https://data.cnra.ca.gov/dataset/nhd-major-features</a> NHD Stewardship Program page on the Department of Water Resources website: <a href="https://water.ca.gov/Programs/All-Programs/National-Hydrography-Dataset-Stewardship">https://water.ca.gov/Programs/All-Programs/National-Hydrography-Dataset-Stewardship</a>	Report Date: September 8, 2022
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\*See the workgroup page for workgroup charter, members, contact information, and prior reports.

Members of the NHD workgroup regularly interact as part of the ongoing work of the California Department of Water Resources (DWR) NHD Stewardship Program. (Stand-alone CA GIS Council NHD Workgroup meetings have not been held.) Our primary partners are the **Geographical Information Center at CSU Chico** and the **Center for Geospatial Science and Technology at CSU Northridge**. Current and recent stewardship partners are **Redwood National Park**, **Los Angeles County Public Works**, the **Marin County collaborators**, and the **US Forest Service**. New partners are always welcome.

## Requests for Council Action

No formal action.

## Status Update

### NHD and WBD to become static in 2023

USGS announced in August to the stewardship community that our ability to edit the NHD will end within the next six months. WBD editing will be cut off in June 2023. Final versions of these datasets will be published in September 2023. No further updates are scheduled for the NHDPlus High Resolution dataset for our area (Region 18.) USGS Hydrography Leads Sue Buto and Steve Aichele have stated that USGS lacks the resources to continue to maintain the current dataset maintenance system while building the new system for the 3D Hydrography Program (3DHP).

These announcements came as a surprise to many in the state stewardship community. In July, the California and Washington state stewards hosted an informal meeting at the Esri User Conference in San Diego, and it was attended by hydrography/NHD-interested people from California, Washington, Tennessee, Arizona, Montana, New Jersey, and New Zealand along with USGS staff, a couple of Esri staff (ArchHydro team) and a staff person from NV5. We shared stories, hopes for the future, and concerns, but USGS provided no indication at that time that they would cease supporting the current NHD so soon. As a result of that meeting, a new Hydrography Stewardship Community is now being hosted by NSGIC (National States Geographic Information Council) and the next meeting has been scheduled for September 15. The lead California steward (Jane Schafer-Kramer) is in the process of becoming a state government member of NSGIC.

Anyone may submit suggested edits to the NHD through the [Markup Application](#) through the end of November 2022. California NHD and WBD users can report errors directly to [nhd\\_stewardship@water.ca.gov](mailto:nhd_stewardship@water.ca.gov) through December 15, 2022.

The transition timelines were presented in a Hydrography Community Call on August 23, 2022, and the recording may be viewed at <https://youtu.be/cg5pMD9VOKM>. Here is a screenshot from a recent USGS presentation on this transition:

## + Transition period – Federal FY 2023

### Finalize NHD, WBD, NHDPlus HR

- USGS will complete queued markups to NHD and WBD
  - User markups submitted before **November 30, 2022** will be implemented
- Phase out NHD Editing by Q1 (**December 31, 2022**)
  - Discontinue new editor training
  - Halt job checkouts
  - Phase out external edit access to the database
- Phase out WBD Editing by Q3 (**June 30, 2023**)
- Halt production work on NHDPlus HR after meeting GPRA goals
- Publish static versions of NHD, WBD, and NHDPlus HR (**Sept 30, 2023**)
  - Static versions will remain available for the foreseeable future
  - Services will remain active for the foreseeable future
- HydroAdd
  - Line event functionality will be released in FY23 and will continue to work against the static NHD.
  - HydroAdd will also work with 3DHP in FY24.



### More on the 3D Hydrography Program

USGS' new approach to developing and managing the NHD, WBD, and NHD Plus is called the 3D Hydrography Program (3DHP.) Presently, NHD/WBD/NHDPlus data is maintained at the 1:24,000 scale, but the users need this data to be at a much higher resolution of 1:5,000 or better, according to the [Hydrography Requirements and Benefits Study](#) published in 2016. The 3DHP will significantly improve the level of detail, currency, and inclusion of hydrography data by deriving a 3D stream network and hydrologic units from accurate, high-quality 3D Elevation Program (3DEP) data, as well as hydrologically enhanced digital elevation and other surfaces to support applications like hydrologic and hydraulic modeling. 3DHP will improve information such as streamflow permanence which would be a numeric value based on the [Probability of Streamflow Permanence \(PROSPER\) model](#), and vastly improve the ability to account for the hydrologic cycle by connecting to wetland, engineered hydrologic systems, and groundwater data using the [Hydro Addressing Tool](#).

<https://www.usgs.gov/national-hydrography/3d-national-topography-model-call-action-part-1-3d-hydrography-program>

### Data Model Changes

USGS has informed us that the data model of the NHD will be simplified. The original data model for the NHD was designed to include any and all water-related features that have been portrayed on their topographic maps, resulting in a very complex schema. Over the years, this has proved to be way too much information to properly maintain in the NHD. USGS has not yet revealed the new data model, but they have told us in presentations that wetlands (SwampMarsh) and other feature types will not be included. Instead, they will provide a way to link the 3DHP with the National Wetlands Inventory, which is maintained by the U.S. Fish and Wildlife Service. We have canceled or altered planned work on the SwampMarsh, Coastline, Estuary, SpringSeep, and BayInlet features, since these feature types will not be represented in the new 3DHP. We are evaluating whether maintaining these as external datasets linked to hydrography via the [Hydro Addressing Tool](#) will be helpful to our users.



## **Ongoing Work**

**Our Interagency Agreements** with the Geographical Information Center at CSU-Chico and the Center for Geospatial Science and Technology at CSU-Northridge will allow for us to continue a portion of our work plan, but amendments will be needed to cover new work more closely aligned with 3DHP. Our stewardship team meets regularly to discuss next steps and longer-range plans.

**Maintenance on the California NHD and WBD at the 1:24,000 scale** will continue until we are cut off from editing. HU 8 subbasins that were first edited by these centers up to six years ago are being updated using recent NAIP imagery and new reference data sources. We are also planning to update NHD in USFS lands but will not be able to complete this task before the deadline.

## **Los Angeles County Department of Public Works Collaboration**

A pilot study on elevation-derived hydrography for conflation into the NHD and updating the WBD has been funded and work is commencing, although it is unknown whether we will be able to get this work completed and conflated into the NHD/WBD before it becomes static. Regardless, we do plan to incorporate it into the 3DHP when USGS is ready for that. The focus area is the Los Angeles River basin using reference datasets provided to us by Los Angeles County Public Works Department. This pilot work will inform our workflows for the 3DHP moving forward.

## **Streamgages Added to the NHD**

Work continues to bring all stream gage locations that collect flow data from the California Data Exchange Center (CDEC) <https://cdec.water.ca.gov/> into the NHD directly and with supplemental join tables to allow users to link directly from the 1:24,000 scale NHD to the CDEC website for the latest flow data. Some of these are already appearing as NHDPoint Gaging Station features, and the join tables along with hydro-linked point events will be available later in 2022 on the CNRA Open Data site.

## **Redwood National Park**

NHD improvement work within Redwood National and State Parks continues. The work is being done by USGS-trained editors in the National Park Service. It is unknown at this time how much will be completed before the deadline.

Action	Key Date
Continue NHD Update work	ongoing
Scope out future work	

## **Other Notes**

The NHD, NHDPlus High Resolution, and WBD are now available in **Geopackage** format. The attribute tables in the .gpkg files contain extra fields in order to convey the attributes residing in domains of the Esri file geodatabase format. The .gpkg files provide improved functionality over shapefiles for use in QGIS and other open-source applications. Download them at <https://prd-tnm.s3.amazonaws.com/index.html?prefix=StagedProducts/Hydrography/>

The Geopackage version lacks FType code descriptions, so we've created a join table with those descriptors and posted it on our open data site: [https://data.cnra.ca.gov/dataset/8bf94181-383a-4730-9b2d-3f367abbfe63/resource/a304fb87-0195-427e-85b2-2b7fd59c5609/download/nhd\\_ftypes.csv](https://data.cnra.ca.gov/dataset/8bf94181-383a-4730-9b2d-3f367abbfe63/resource/a304fb87-0195-427e-85b2-2b7fd59c5609/download/nhd_ftypes.csv)



The statewide extract of the NHD available for download at <https://www.usgs.gov/core-science-systems/ngp/national-hydrography/access-national-hydrography-products> was updated in August.

DWR archives the California extracts of the NHD (going back to March 2018) on the Natural Resources Agency Open Data site <https://data.cnra.ca.gov/dataset/nhd-archive> each time the dataset is refreshed on the USGS website, which normally happens two to four times each year. Also found on the CNRA Open Data site are quick links to the various NHD websites and three derivative datasets: NHD Major Rivers, NHD Major Rivers and Creeks, and NHD Major Lakes and Reservoirs. <https://data.cnra.ca.gov/dataset/nhd>. The NHD-aligned Wild and Scenic Rivers – California Designations are available for download at <https://data.cnra.ca.gov/dataset/wild-and-scenic-rivers-california-state-designations-only-2020>.

**We are actively reviewing suggested corrections to the NHD received via the [USGS Markup Application](#) and coordinating the editing work needed to resolve the errors. We have made progress on the backlog. Users of the NHD and the Watershed Boundary Dataset may report errors and omissions by way of this application or by contacting the steward at [nhd\\_stewardship@water.ca.gov](mailto:nhd_stewardship@water.ca.gov).**

## Appendix

Contact Information:

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