

# Establishing Methods and A Baseline for A National Scale Cross Section Database

Jim Coll<sup>1,2</sup>, Mike Johnson<sup>1,2</sup>, Arash Modaresi Rad<sup>1,2</sup>, Angus Watters<sup>1,2</sup>, Justin Singh-Mohupur<sup>1,2</sup>, Dami Eyelade<sup>1,2</sup>, Fernando Salas<sup>2</sup>

<sup>1</sup>NOAA Office Of Water Prediction, <sup>2</sup>Lynker,



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## A SHARED CHALLENGE

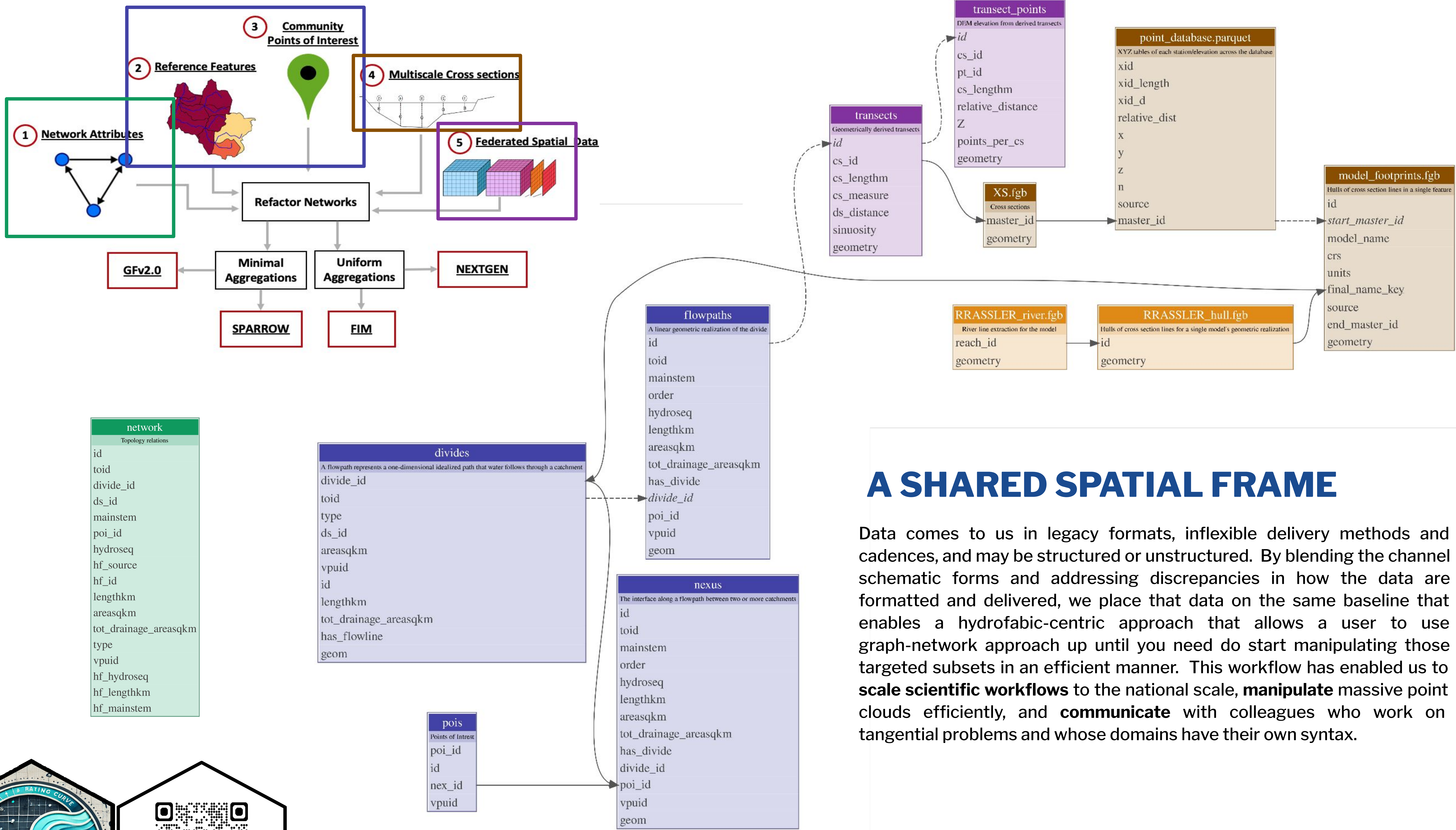
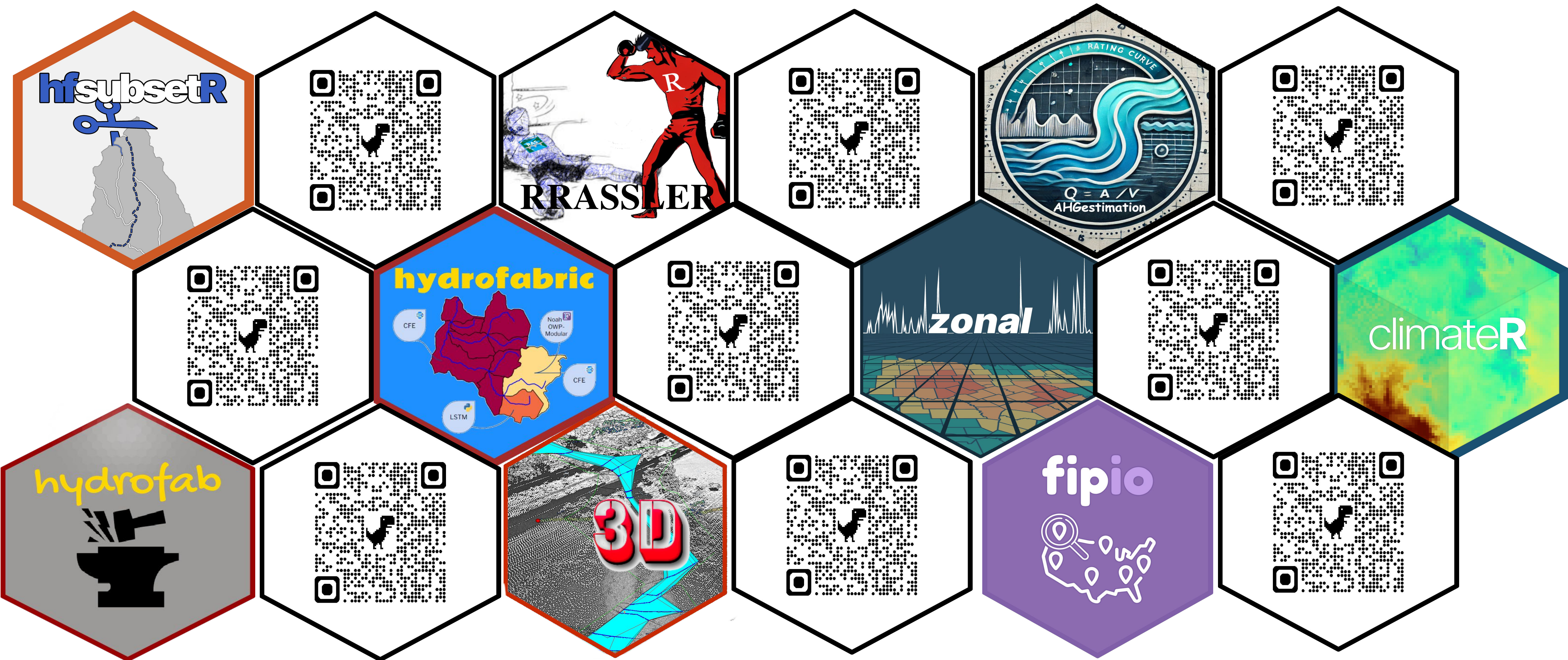
As the state of our forecasting abilities increase, there is an intense demand to integrate high and hyper-resolution datasets into the workflow. However, the scale and form of that data makes it difficult to manipulate and capitalize on all the rich efforts that occur at these high resolutions but are stymied by technical limitations like data size, processing cost, and the pain of interoperating with legacy, unwieldy, or otherwise silo'd workflows.

## A SHARED OBJECTIVE

Our common mission with this effort is to catalyze the Findability, Accessibility, Interoperability, and Reuse (F.A.I.R. Principles) of the collective efforts of the community while reducing duplicated efforts and advancing the skill of both our forecast and the community.

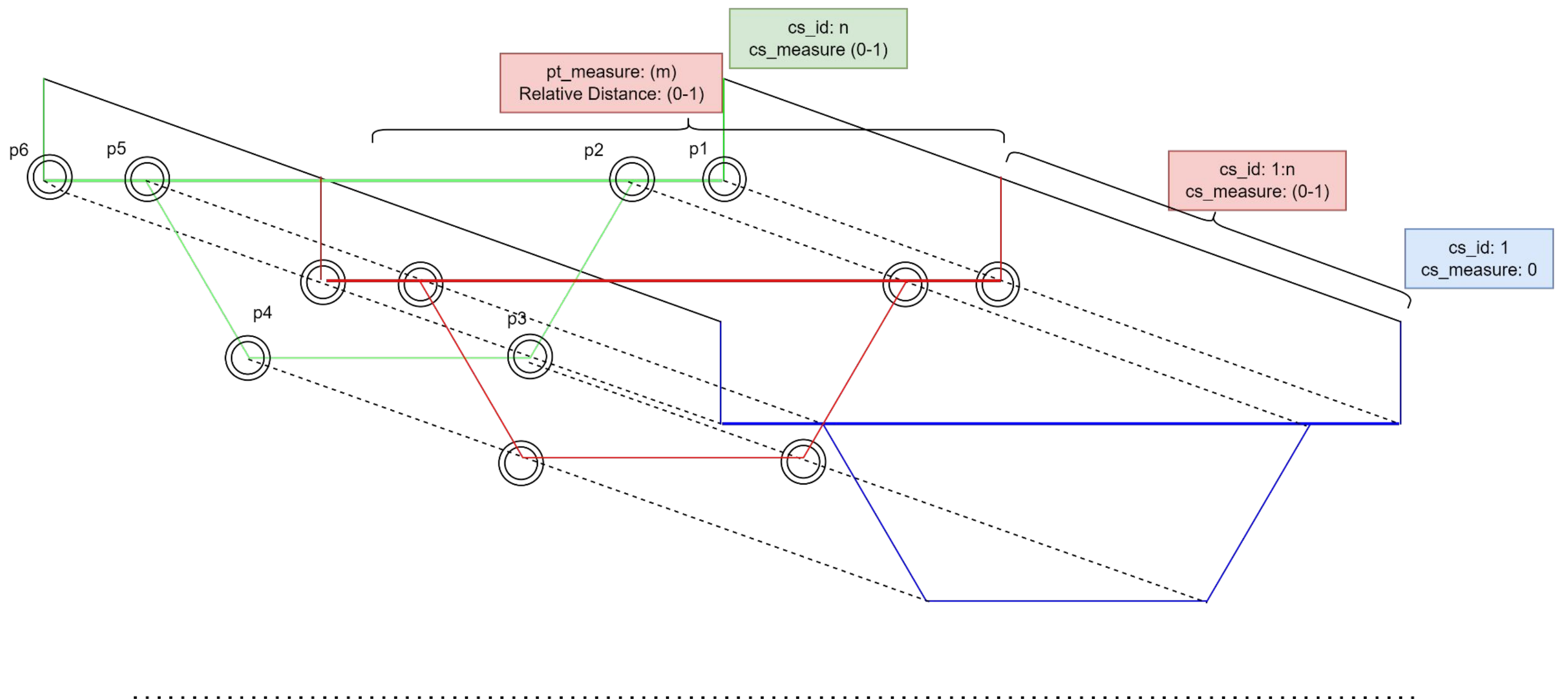
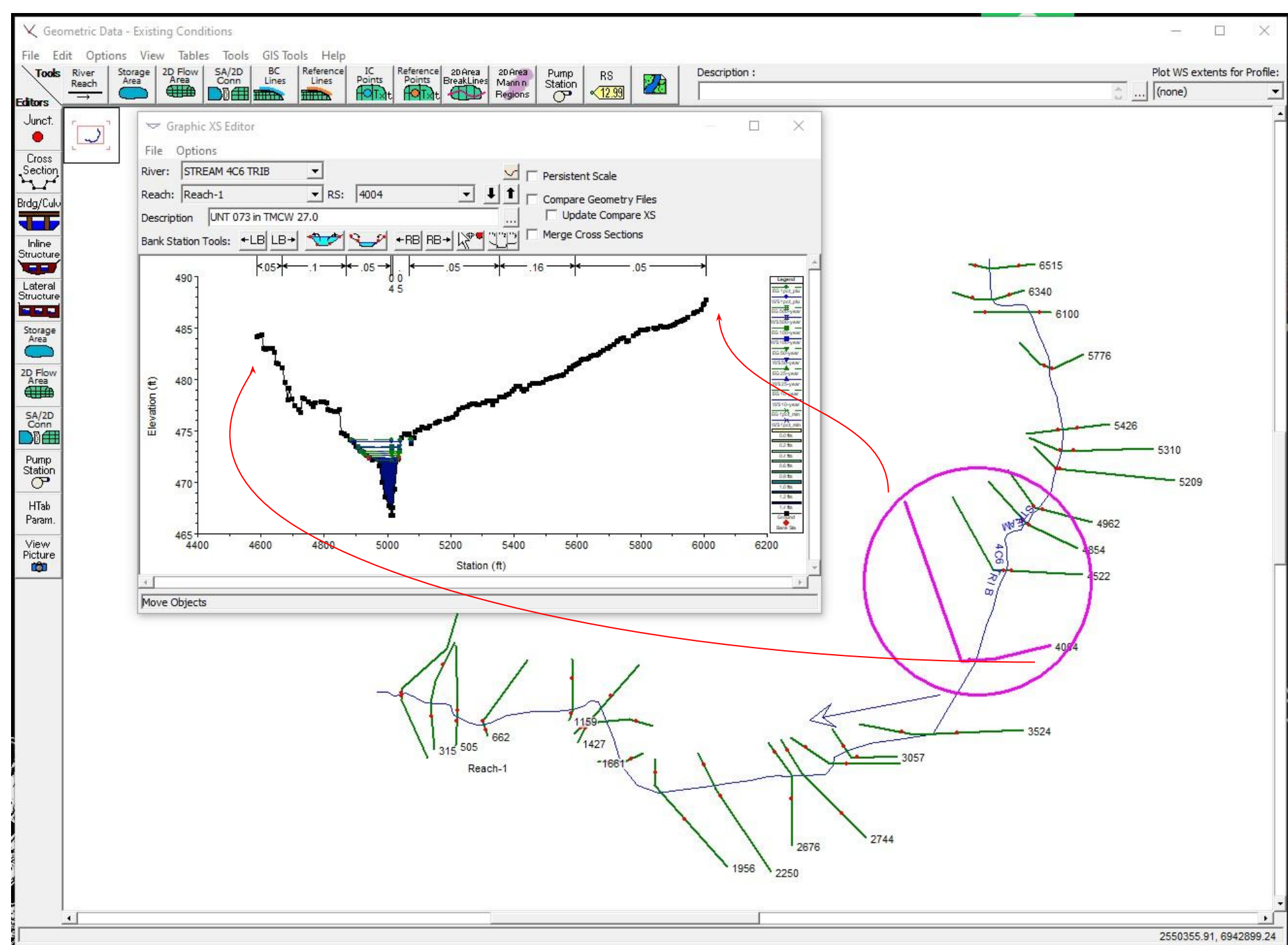
## A SHARED ECOSYSTEM OF UTILITIES

Having a shared set of utilities in a common language allows for easier collaboration, faster development cycles, and greater code maintainability. It eliminates the need for developers to learn multiple languages or translate code between different systems, saving time and effort. Additionally, a shared set of utilities can lead to more consistent and reliable software with fewer bugs and security vulnerabilities. The Hydrofabric team is multilingual but our preferred language is R, and to date we've deployed several packages that collectively allow a user to weave across the different scales and domains without having to switch contexts.



## A SHARED SPATIAL FRAME

Data comes to us in legacy formats, inflexible delivery methods and cadences, and may be structured or unstructured. By blending the channel schematic forms and addressing discrepancies in how the data are formatted and delivered, we place that data on the same baseline that enables a hydrofabric-centric approach that allows a user to use graph-network approach up until you need do start manipulating those targeted subsets in an efficient manner. This workflow has enabled us to **scale scientific workflows** to the national scale, **manipulate** massive point clouds efficiently, and **communicate** with colleagues who work on tangential problems and whose domains have their own syntax.



### ACKNOWLEDGEMENTS:

The packages and work presented here are all part of the larger efforts of the Hydrofabric team and we are grateful to all who contributed both directly and indirectly to the development and deployment of these packages. See the listed repositories DESCRIPTION files. We are also appreciative of the FEMA region 6 group and the BLE data they make publicly available, and the USGS 3D Elevation Program (3DEP) seamless 1 meter DEM

### REFERENCES:

<https://noaa-owp.github.io/RRASSLER/articles/RRASSLER-format.html>

### CONTACT

Website: <https://water.noaa.gov>  
Email: [nws.nwc@noaa.gov](mailto:nws.nwc@noaa.gov)

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