OWP | OFFICE OF WATER PREDICTION

FLOG Meeting

Geo-Intelligence Division FIM Development Updates

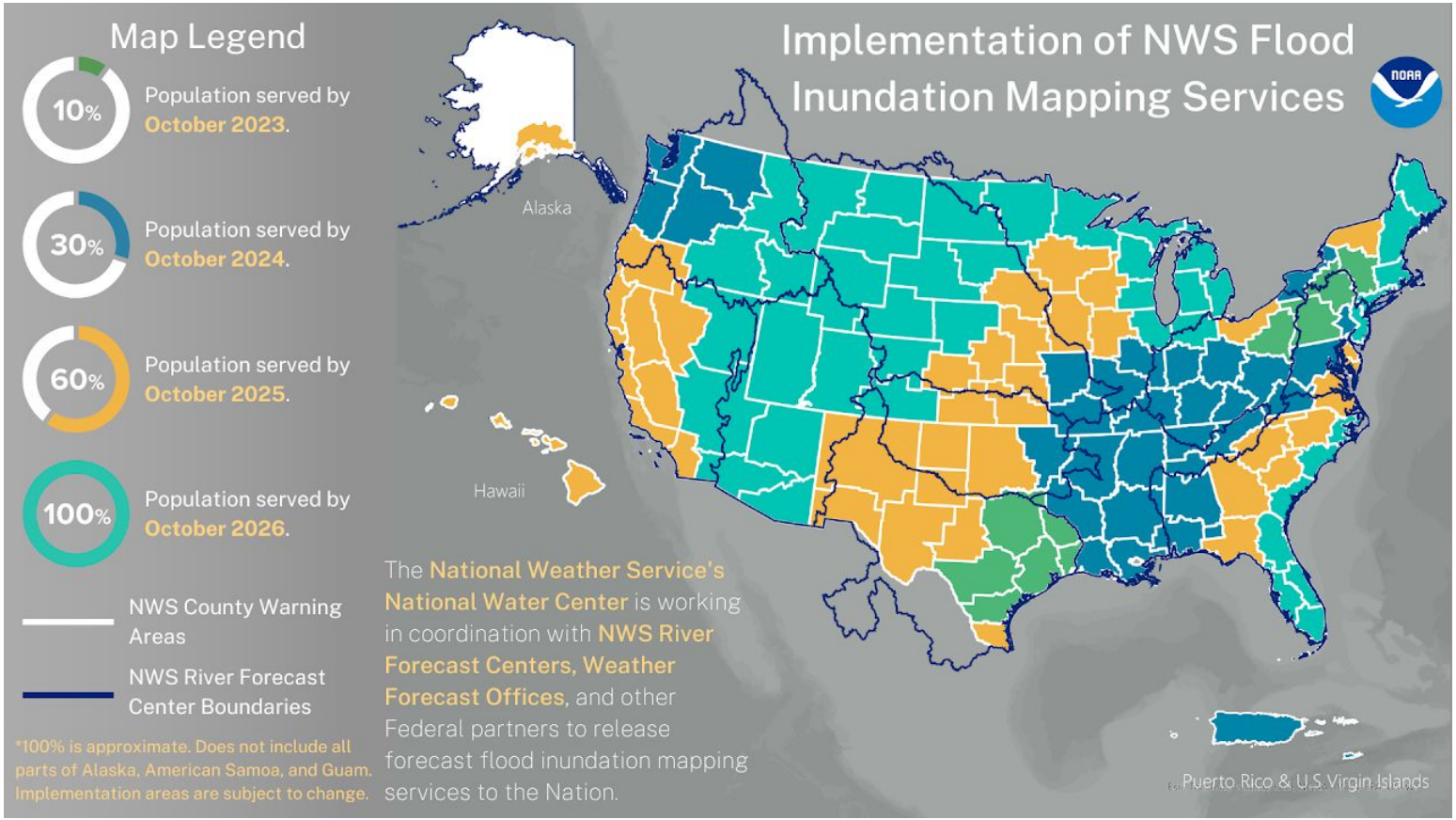
October 4th, 2024

Topics For Today

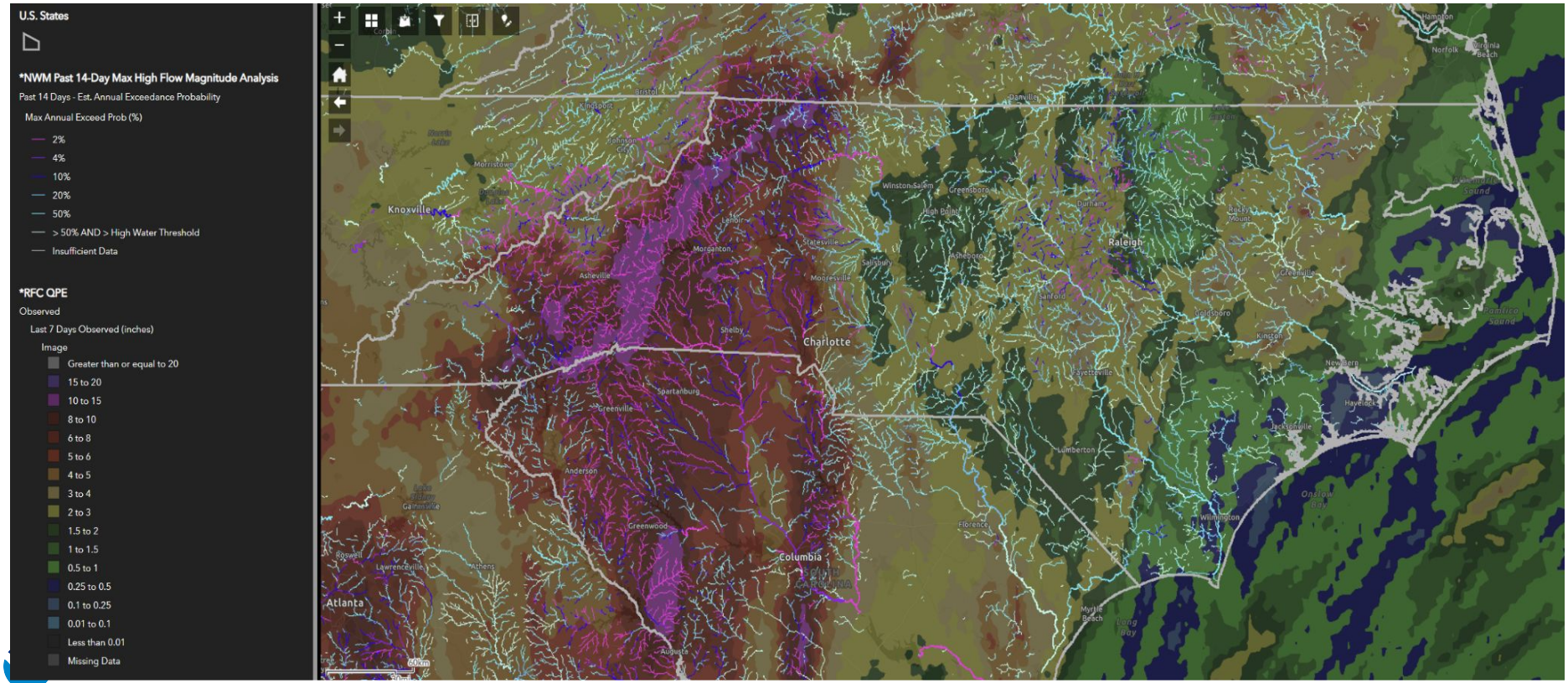
National Weather Service FIM Development Update

- We have expanded to FIM 30
- Touch on FIM Performance for Helene
- Visualization of the Newest Update FIM Version 5 - Carson Pruitt
- Update on Lidar Bridge Technique - Ali Forghani

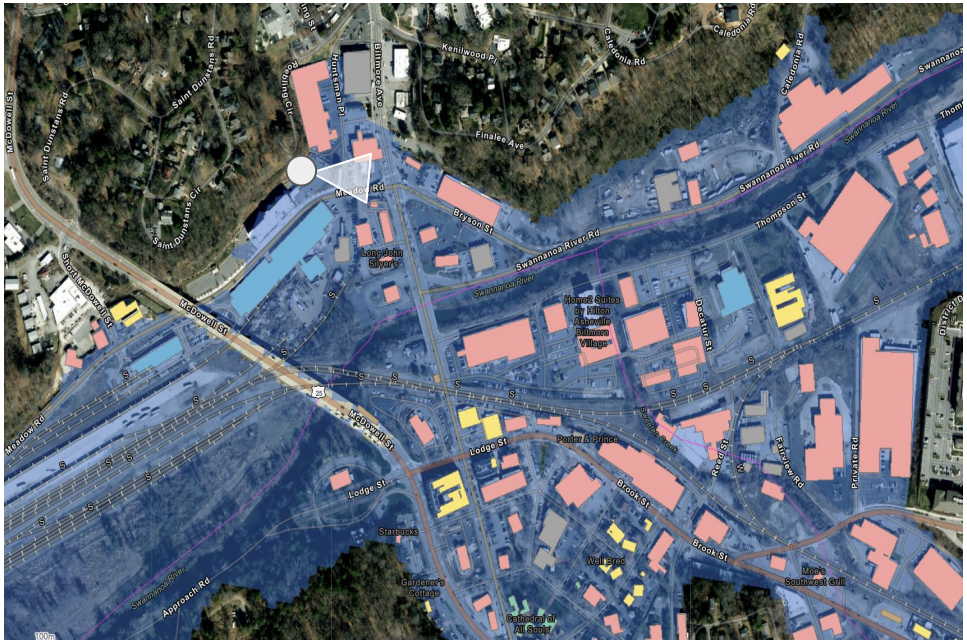
FIM 30% of the Nation Officially Released



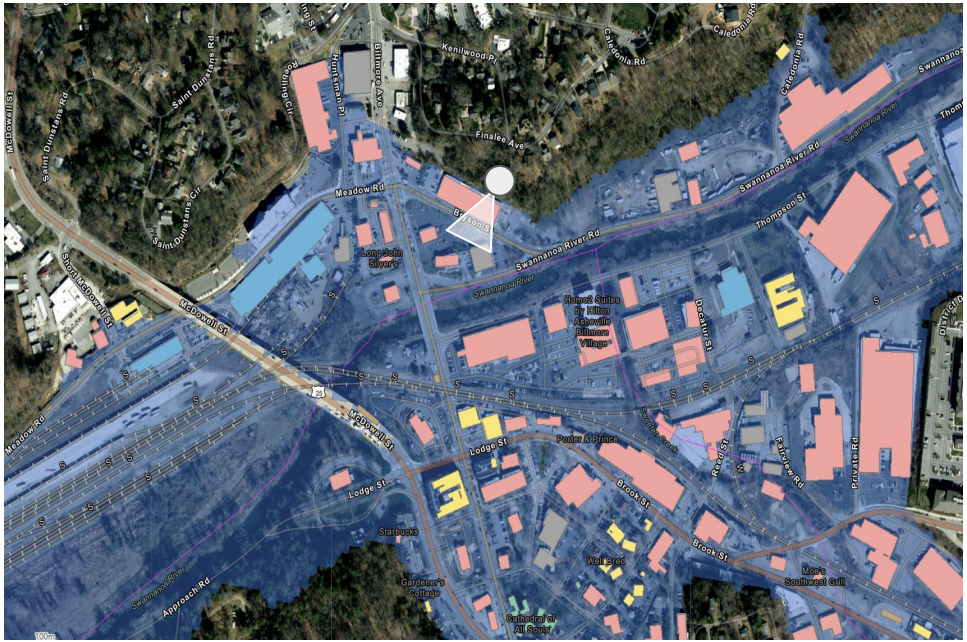
Some Remarks On Helene



Asheville North Carolina

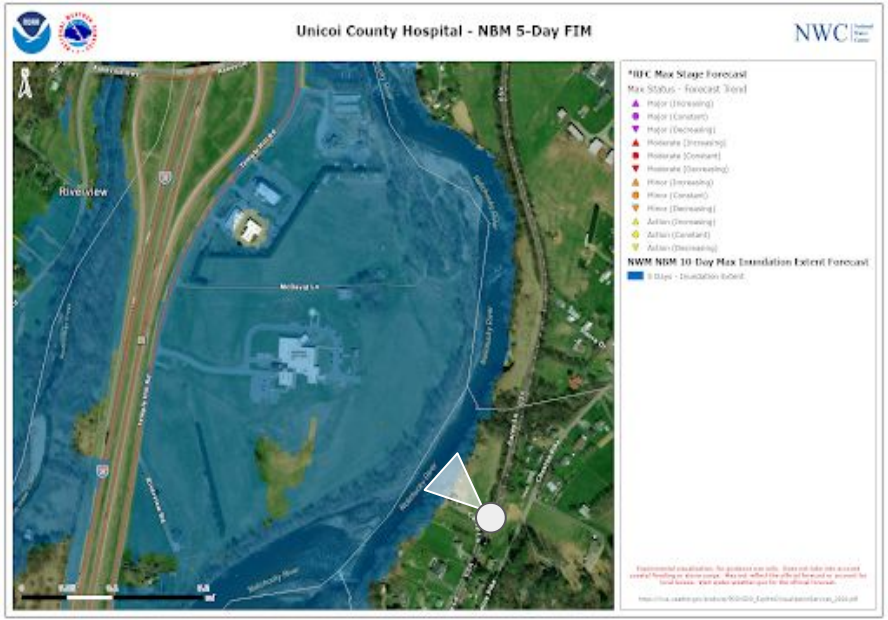


Asheville North Carolina

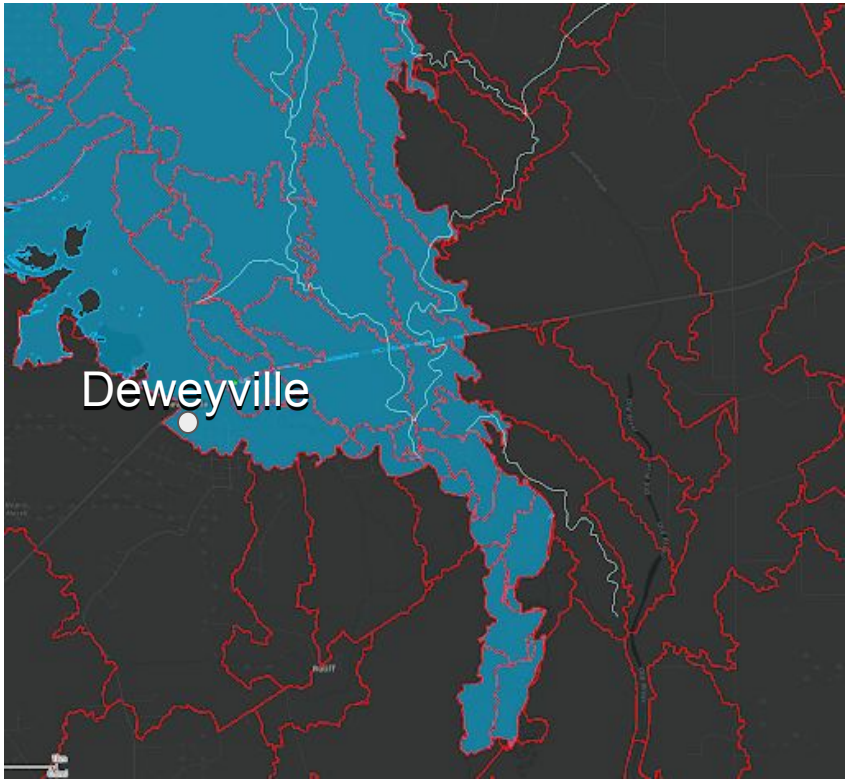


Rainbow Bridge - Chimney Rock, North Carolina

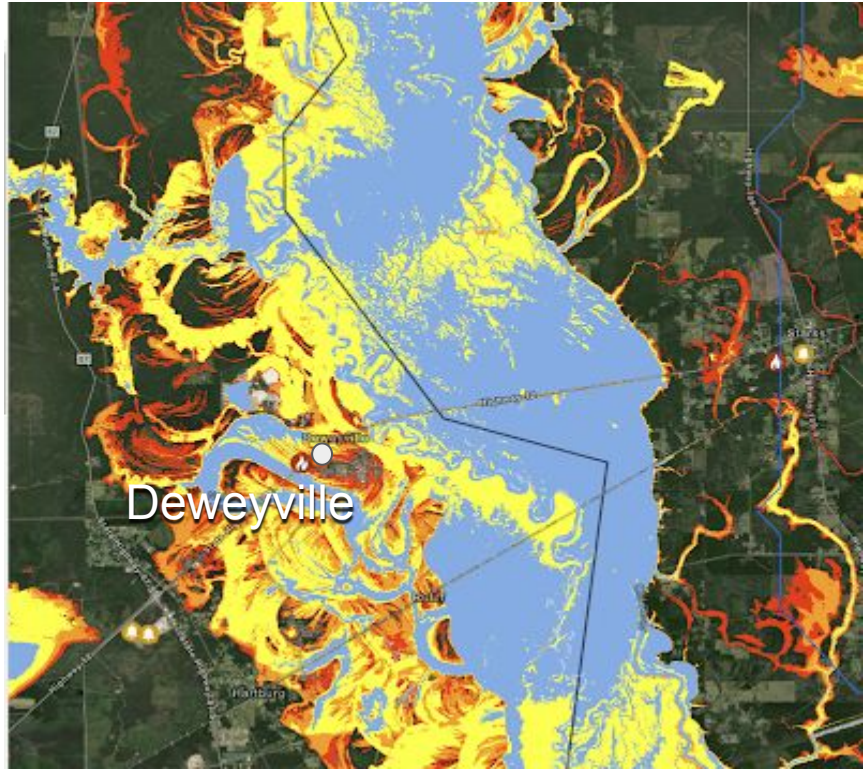
Unicoi Hospital Evacuation



Multi-model FIM Mapping Solution



HAND Version 4.4



RAS2FIM Version 2.0


Production
Staging
Suwannee R @ Wilcox, FL
Crosswalk fix eliminated erroneous inundation
RFC FIM
8/31/2024
Wannee
Old Town
Nature Coast State Trail
Andrews Wildlife Management Area
Manatee Road
FIM v4.4
FIM v5.0


Production
Staging
Broad Cr @ Laurel, DE
2 out of 5 bridges inundated
NWM GFS FIM
8/30/2024
Marvil Dr
Penn St
Locust St
Juniper St
Sussex Ave
Wilson St
Washington St
Brooklyn Ave
N Central Ave
Delaware Ave
Broad Creek Greenway
Broad Creek
Laurel River Park
Laurel
Willow St
E 4th St
E 5th St
Elm St
Pine St
1
2
3
4
5
?
FIM v4.4
FIM v5.0


Production
Staging
Chinquapin Cr @ Spartanburg, SC
3 false positive buildings eliminated
NWM GFS FIM
8/30/2024
FIM v4.4
FIM v5.0
Pinewood Shopping Center
McCravy Dr
Wade's Restaurant
United Rentals
Pinewood Resource Center
Chinquapin Creek
Kimbrell's Furniture
Spartanburg County Public Health Dept.
Cardiothoracic & Vascular Surgery Center
Rite Aid
Food Lion
Palmetto Infusion Services
E Wood St
CVS Pharmacy
Heart Wellness Center
Skyline Imports
Spartanburg Vein Center
Starbucks

Bridge Healing Motivation

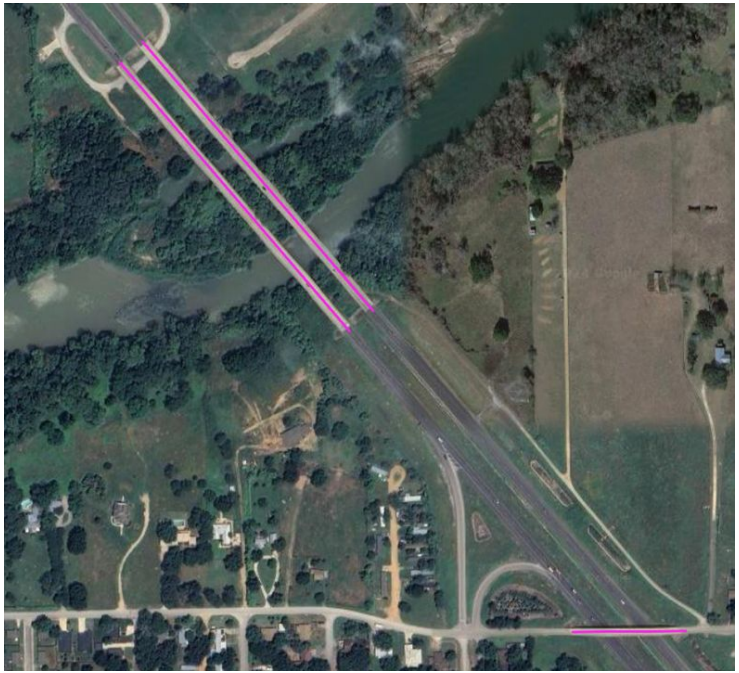
- The USGS 3DEP DEM used in HAND represents bare earth and excludes bridges.
- Therefore, the DEMs lack bridge elevations, causing more frequent unrealistic inundation.
- The goal is to restore the actual elevations of bridges in the input DEM or to integrate these elevations within the HAND methodology.

Data

USGS / Entwine Lidar

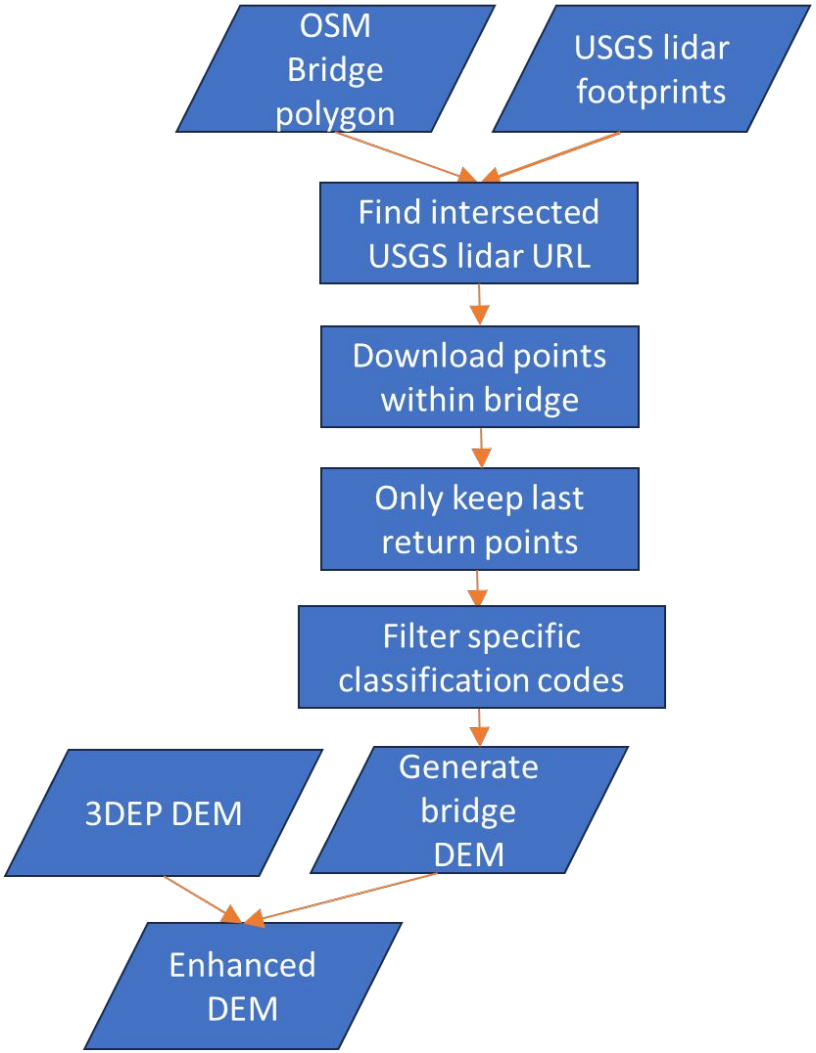
67,008,853,055,374 points in **2,151** resources

Open Street Map (OSM) bridge lines



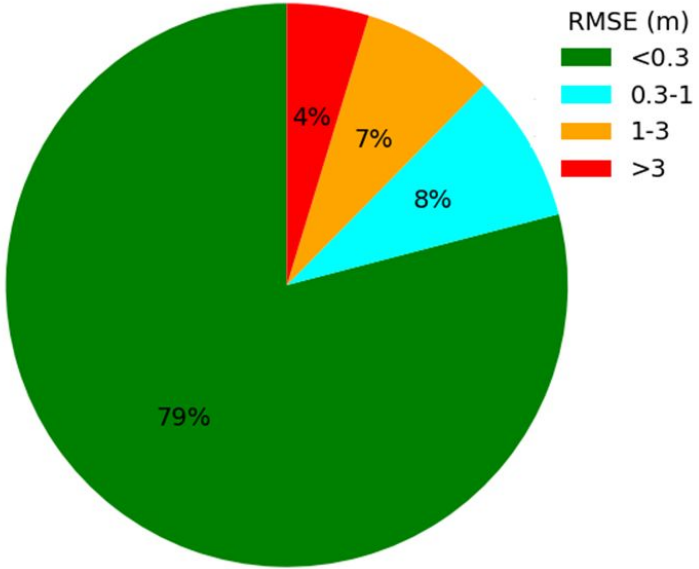
There are ~720K OSM bridges, with 89% of them covered by USGS lidar data.

Workflow


OSM Bridge polygon
USGS lidar footprints
Find intersected USGS lidar URL
Download points within bridge
Only keep last return points
Filter specific classification codes
3DEP DEM
Generate bridge DEM
Enhanced DEM

Benchmarking lidar-generated tif files

- Used bridge tif files created for TX-Bridge Flood Forecaster project
- Compared elevations at random sample points within 716 bridges in HUC 12090301
- 79% of bridges show discrepancy of less than 1ft (0.3m)



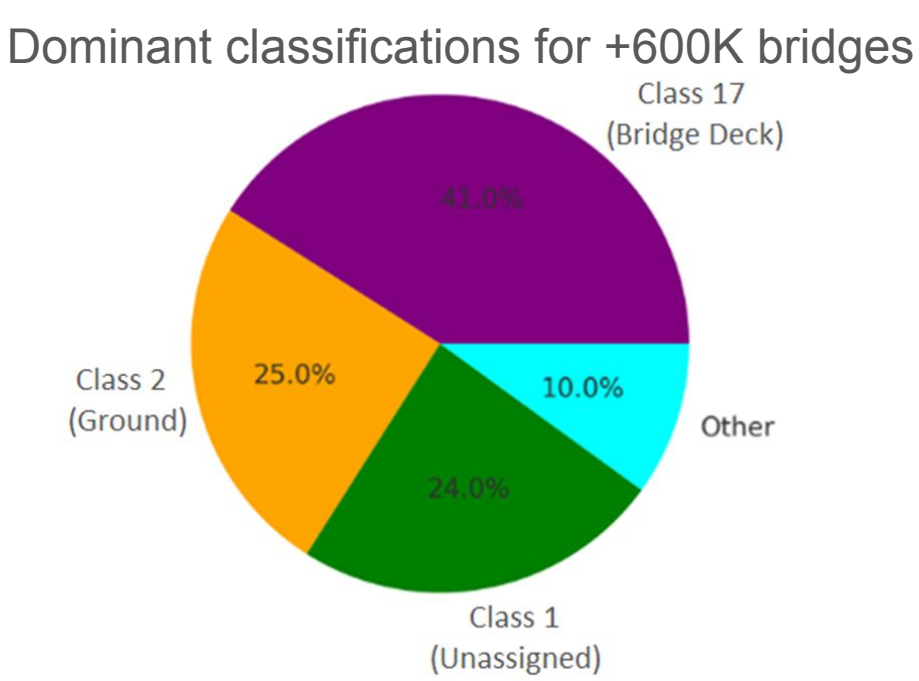
- 90% of lidar points belong to class code 13.

Which classification codes to use?

For ~640K OSM bridges, downloaded last return lidar points and analyzed classification codes:

Sample Results

osmid	class_code	count	count %
368044	2	1	0
368044	17	589	100
3129874	1	233	51
3129874	17	222	49
3144039	1	2	1
3144039	2	13	4
3144039	17	345	96
3144312	1	257	45
3144312	7	1	0
3144312	17	309	54
3886657	1	66	4
3886657	17	1686	96



Will use classification codes 17, 2, 1, and possibly 13 (the older code for bridge deck).