

# New CWA 303(d) Measures Pilot Results

2014 National Training Workshop on CWA 303(d)  
Listing and TMDLs

Shepherdstown, West Virginia

May 6, 2014

# Outline

Overview of new CWA 303(d) measures

Overview of catchments

Discuss results of the CWA 303(d) measures pilot

- Example Tennessee Key Performance Measure (WQ-27)

Discuss Lessons Learned

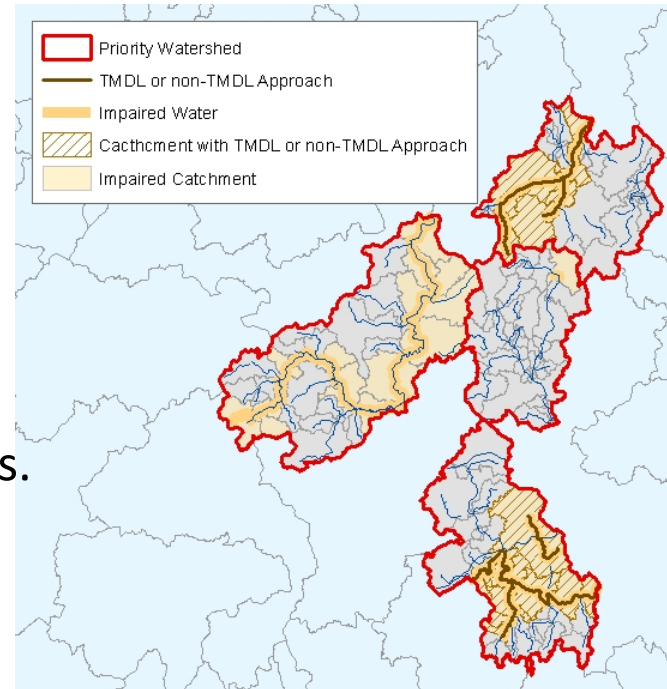
Identify topics that require further discussion

## Overview of new CWA 303(d) measures

- Designed by States and EPA
- Approved by OMB
- Reduced burden for EPA and States
- Improved data systems to track information
  - ATTAINS Redesign
  - Funding and technical support

# New CWA 303(d) Measure (WQ-27)

**Extent of priority areas** identified by each State that are addressed by EPA-approved **TMDLs or alternative restoration** approaches for **impaired** waters that will achieve water quality standards. These areas may also include **protection approaches** for **unimpaired** waters to maintain water quality standards.



- Expressed as percentage of watershed area (by state and aggregated nationally).
- Priority areas are defined by each State in close coordination with the EPA Regions and the public.
- Alternative restoration approach is a plan and/or a set of actions pursued in near-term (other than a TMDL) that in their totality are designed to attain water quality standards.
- Protection approach is a plan and/or a set of actions pursued in the near-term that are designed to maintain or improve unimpaired waters in attaining water quality standards.
- Targets are set annually as well as long-term for 2022.

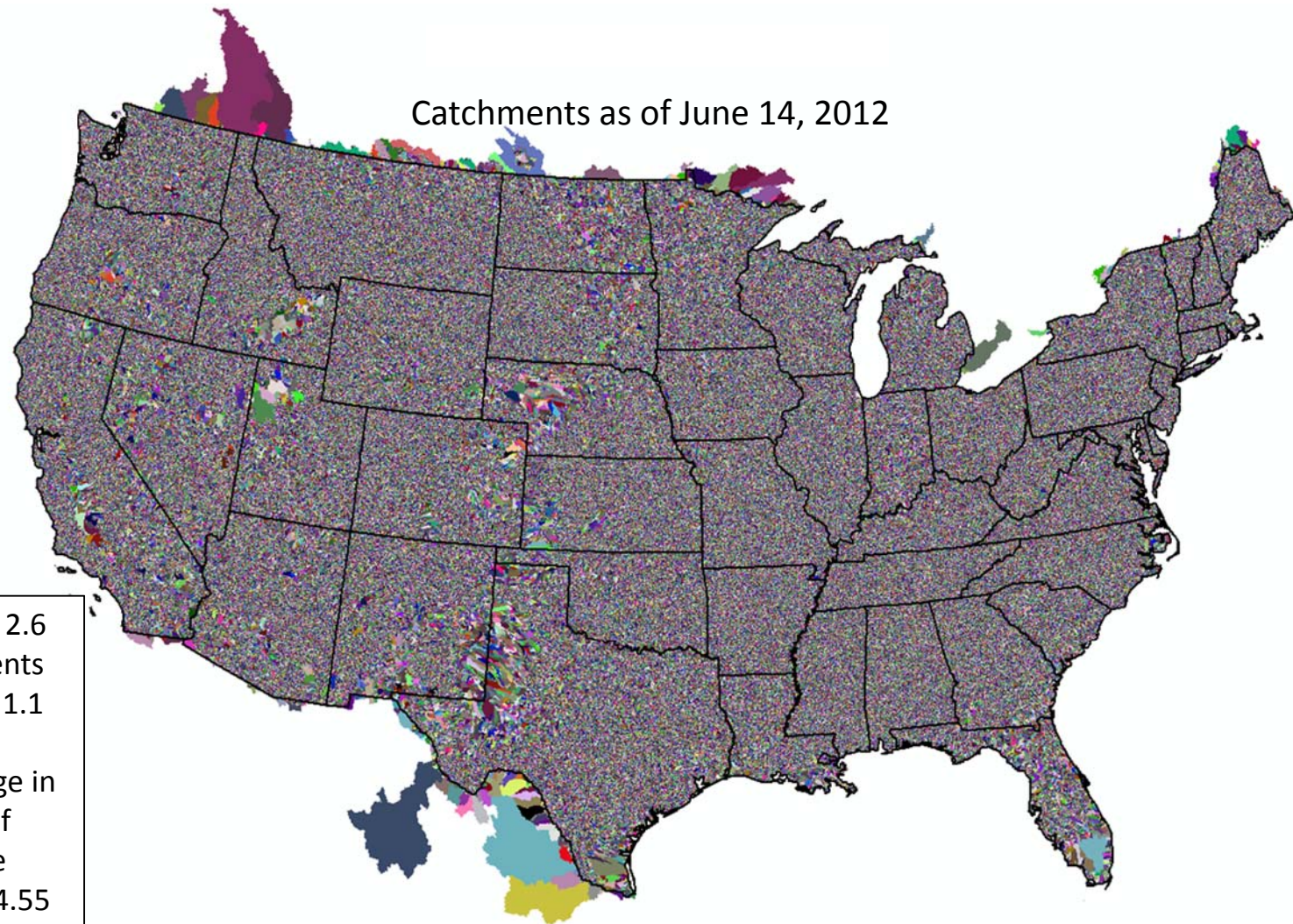
## New CWA 303(d) Complementary Measure (WQ-28)

**State-wide** extent of **activities leading to completed TMDLs or alternative restoration approaches for impaired waters, or protection approaches for unimpaired waters.**

- Indicator metric (not required)
- Allows tracking of incremental activities
- Allows tracking of activities outside of priority areas
- Opportunity to present a more complete state picture

# NHDPlus Catchments

Provide a standard geospatial unit to track state assessment decisions regardless of scale or water body type.



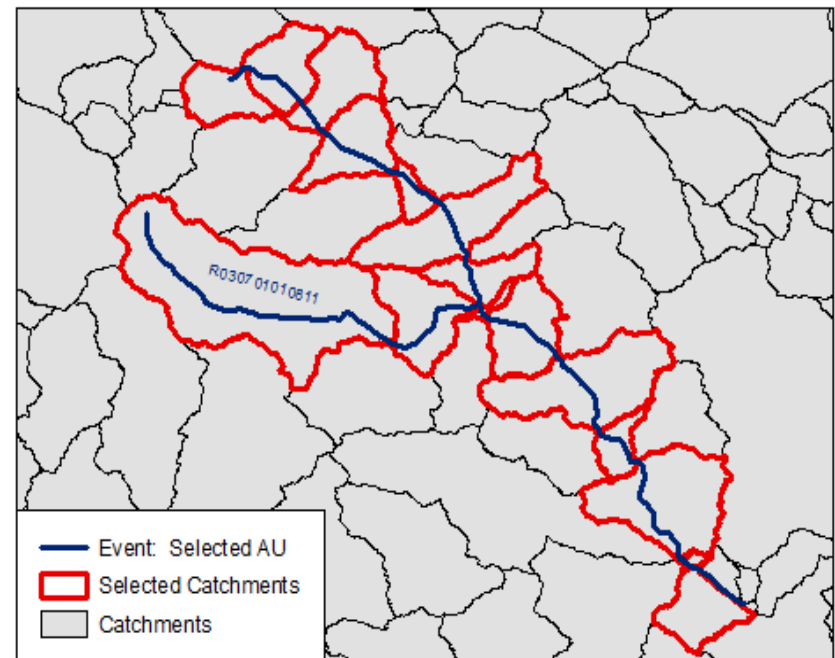
- Approximately 2.6 million catchments
- Average size is 1.1 sq. mile
- Significant range in size, but 99% of catchments are smaller than 14.55 sq. miles

## Catchment\* Approach

EPA will use automated procedures to develop a correspondence between state assessment units and NHDPlus catchments

- State geo data would be used for display purposes and the catchment correspondence data would be used for national analyses

\* A catchment is the land surface that drains to each stream segment in the 1:100,000 scale NHDPlus.



**Step K.6. Final Catchments associated with the selected Event (AssessmentUnit).**

# 303(d) Measures Pilot Process: WQ-27

Step 1: Identified states to participate in pilot

Step 2: Requested information from states

Step 3: Reviewed state information

Step 4: Identified and processed state geospatial data to catchments

Step 5: Conducted QA on the catchment output

Step 6: Prepared instructions to calculate the measures

Step 7: Calculated the universe of priority areas

Step 8: Identified priority catchments that contain waters with completed TMDLs, alternative plans, or protection plans (Cycle A)

Step 9: Identified priority impairment(s)/pollutant(s)\* that were still on the State 303(d) list to remove those catchments from consideration

Step 10: Calculated the total area of catchments identified in Steps 8 and 9, and recorded this information in the computations spreadsheet

Step 11: State to fill in "targets"

Step 12: Repeated Steps 8, 9, and 10 for Cycle B

\* The terms impairment and pollutant are often used interchangeably. Generally, we refer to causes of impairment in relation to the states 303(d) list, and pollutants in relation to TMDLs



# 303(d) Measures Pilot Process: Step 1

Identified 13 states to participate in the pilot

- Region 1: CT
- Region 3: MD, PA, VA
- Region 4: KY, TN, NC
- Region 7: IA, KS, MO
- Region 8: CO
- Region 9: AZ
- Region 10: AK

## 303(d) Measures Pilot Process: Steps 2 and 3

Step 2: Requested information from the states, which included:

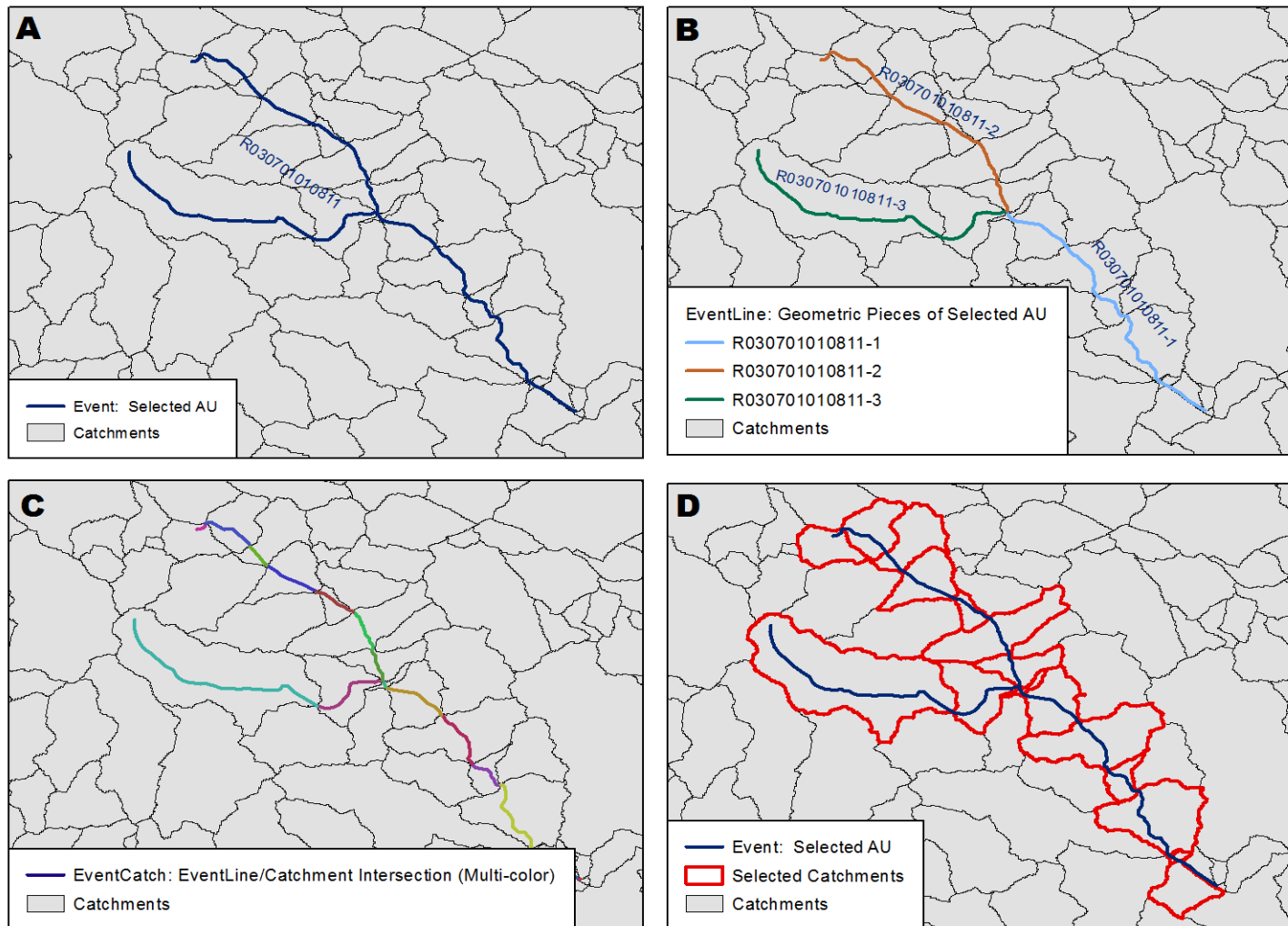
- provide a description of the priority areas;
- indicate what priority areas focus on (e.g., pollutants, designated uses);
- available GIS data for priority areas;
- identify Integrated Reporting cycle A and B;
- available information on TMDL alternatives for inclusion in the pilot;
- interest in testing the complementary (Indicator) measure.

Step 3: Reviewed state responses to questions in Step 2, and started to collect data from states or identify data in-house. Identified gaps in the data and asked states for further clarification on approach, if necessary

# 303(d) Measures Pilot Process: Step 4

Identified and processed state geospatial information (lines and polygons) to catchments (contractor). Geospatial information included state 303(d) and 305(b) data, as well as TMDL data.

## Linear to Catchment Prototype Example

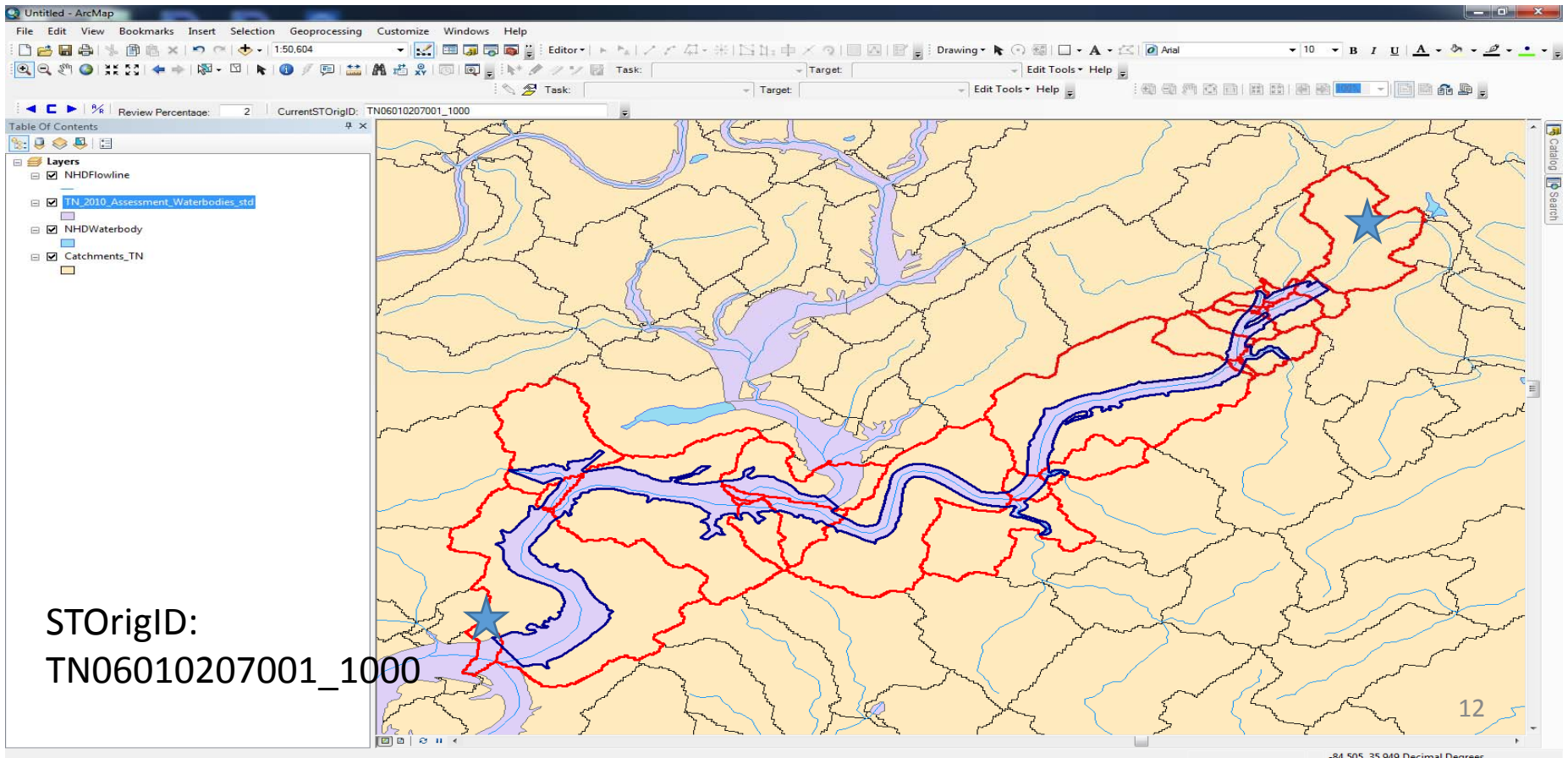


# 303(d) Measures Pilot Process: Step 5

Conducted QA on the catchment output (contractor) to identify errors in the process.

## Tennessee QA

- Line Failures. The TN files had 35 line failures to be inspected. 25 were errors that had to be corrected.
- Found several issues related to braided streams.
- Found a few cases where small catchments located on an AU failed to conflate.
- Example below shows two extra catchments added to this lake, these were deleted. ★



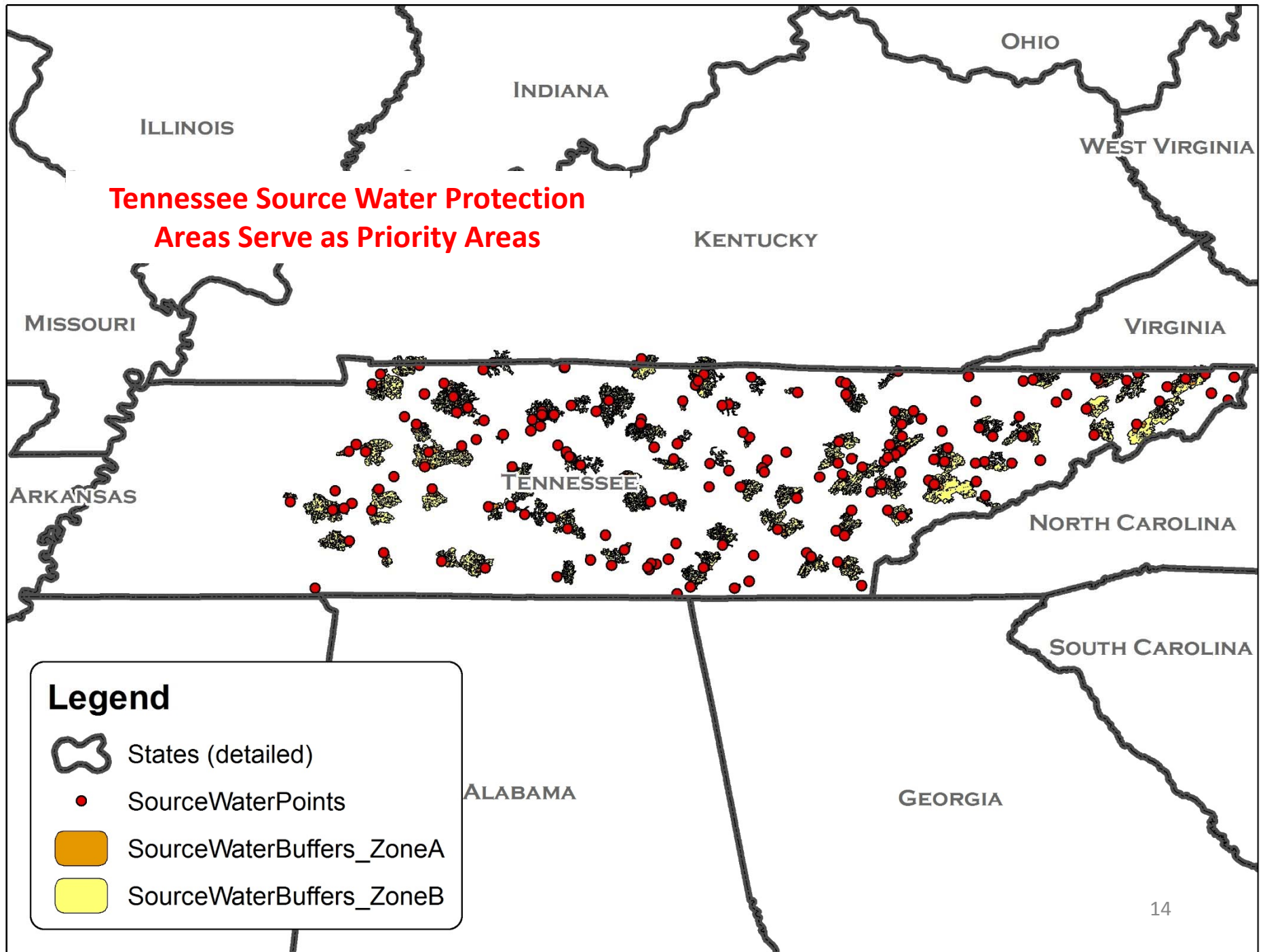
# 303(d) Measures Pilot Process: Step 6

Based on the information available, prepared instructions that outlined the process to calculate the core and, when indicated, complementary measures.

## Tennessee

- Priority area: Hypothetical: Source Water Protection Area (DU based);
  - Provided GIS data for source-water protection areas:
    - SourceWaterPoints.shp
    - SourceWaterBuffers\_ZoneA.shp
    - SourceWaterBuffers\_ZoneB.shp
- Integrated Reporting Cycles: 2010 and 2012;
  - Provided shapefiles for streams and waterbodies (lakes) for 2010 and 2012 reporting cycle
- Data for complementary measure: will use completed plans only outside of priority areas for complementary measure based on approved TMDLs
- Notes:
  - Used ATTAINS to pull TMDL information for the 2010 and 2012 segments





**Tennessee Source Water Protection  
Areas Serve as Priority Areas**





**Identify Priority Areas by  
Selecting Catchments that  
Correspond with TN  
Source Water Protection  
Points and Buffers**

**Legend**

-  Priority Catchments in TN
-  SourceWaterPoints
-  SourceWaterBuffers\_ZoneA
-  SourceWaterBuffers\_ZoneB

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community



**1. Priority Catchments Identified, in this case with a "Y"**

Table

Priority Catchments\_TN

FID	Shape	OBJECT	GRIDCO	FEATURE	SOURCE	Prior_Cats	AreaSqKM	Shape_Le	Shape_Ar	AreaDiff	DiffPct	TMDL_p2011	303d_2010	TMDL_p2013	3
179	Polygon	763519	229317	4037112	NHDFlowli	Y	3.0987	0.104465	0.000312	0.00119	0.0003		Y		Y
180	Polygon	763520	229318	4036482	NHDFlowli	Y	0.0855	0.01887	0.000009	0.00030	0.0036	Y	Y	Y	Y
181	Polygon	763521	229319	4037171	NHDFlowli	Y	12.6522	0.262347	0.001274	0.00442	0.0003	Y	Y	Y	Y
182	Polygon	763527	229325	4036448	NHDFlowli	Y	0.1503	0.023704	0.000015	0.00197	0.0131	Y	Y	Y	Y
183	Polygon	763528	229326	4036428	NHDFlowli	Y	0.1017	0.042104	0.000004	0.00000	0.0005	Y	Y	Y	Y
409	Polygon	764303	230108	4034254	NHDFlowli	Y	0.4275	0.033427	0.000000	0.00000	0.0000				Y
410	Polygon	764304	230109	4034242	NHDFlowli	Y	1.2879	0.033427	0.000000	0.00000	0.0000				Y
411	Polygon	764305	230110	4034220	NHDFlowli	Y	0.1422	0.033427	0.000000	0.00000	0.0000				Y
458	Polygon	764437	230242	4034350	NHDFlowli	Y	1.8054	0.033427	0.000000	0.00000	0.0000				Y
460	Polygon	764454	230259	4034310	NHDFlowli	Y	0.216	0.030311	0.000022	0.00006	0.0002				Y
461	Polygon	764455	230260	4034286	NHDFlowli	Y	1.4562	0.101381	0.000147	0.00044	0.0003				Y
533	Polygon	764755	230564	4034364	NHDFlowli	Y	0.3501	0.03192	0.000035	0.00165	0.0047	Y	Y		Y
968	Polygon	792770	258831	10192996	NHDFlowli	Y	2.3454	0.093176	0.000236	0.00127	0.0005				Y
141	Polygon	796499	262606	12152712	NHDFlowli	Y	2.1267	0.08834	0.000214	0.00174	0.0008	Y	Y	Y	Y
156	Polygon	796679	262788	12152730	NHDFlowli	Y	8.4321	0.178034	0.000848	0.00473	0.0005	Y	Y	Y	Y
225	Polygon	797588	263706	10182213	NHDFlowli	Y	2.8899	0.117903	0.00029	0.00081	0.0002	Y	Y	Y	Y
239	Polygon	797780	263900	10182037	NHDFlowli	Y	0.369	0.032461	0.000037	0.00082	0.0022		Y		Y
239	Polygon	797781	263901	10182021	NHDFlowli	Y	7.3872	0.190843	0.000743	0.00050	0.0000		Y		Y
239	Polygon	797782	263902	10181997	NHDFlowli	Y	1.8711	0.093643	0.000188	0.00150	0.0008		Y		Y
240	Polygon	797801	263921	10182011	NHDFlowli	Y	1.3788	0.076098	0.000139	0.00022	0.0001		Y		Y
240	Polygon	797805	263925	10183141	NHDFlowli	Y	2.3598	0.092916	0.000236	0.00039	0.0001		Y		Y
242	Polygon	797822	263943	10183137	NHDFlowli	Y	1.2654	0.075442	0.000127	0.00191	0.0015		Y		Y
250	Polygon	797949	264070	10183133	NHDFlowli	Y	5.7375	0.151593	0.000574	0.00007	0.0000		Y		Y
250	Polygon	797950	264071	10183119	NHDFlowli	Y	2.1474	0.078029	0.000215	0.00056	0.0002		Y		Y

2. Calculate Total Area of all Priority Catchments



# 303(d) Measures Pilot Process: Step 7

## Calculated the universe of priority areas

- Based on state-defined priorities, identify catchments that correspond to these priorities
- Calculate the total area for priority catchments and record this information in the computations spreadsheet

Key Performance Measure Computations (WQ-27)		
"Extent of priority areas identified by each State that are addressed by EPA-approved TMDLs or alternative restoration approaches for impaired waters that will achieve water quality standards. These areas may also include protection approaches for unimpaired waters to maintain water quality standards"		
	Number (Acres)	Percent of Total Priority Area
Number of Priority Acres	5,734,071.53	100%
Total watershed area (acres) corresponding to existing TMDLs in the priority areas in reporting cycle A	424,148.32	7%
Based on the number of existing TMDLs in reporting cycle A, estimate a "Target" for the total watershed area (acres) in the priority areas with TMDLs for reporting cycle B	0.00	0%
Total watershed area (acres) corresponding to existing TMDLs in the priority areas in reporting cycle B	524,944.92	9%

# 303(d) Measures Pilot Process: Step 8

Identified priority catchments that contain waters with completed TMDLs, alternative plans, or protection plans for Cycle A

- If priorities are based on impairment(s)/pollutant(s)\* then identify the catchments that contain waters with completed TMDLs, alternative plans, or protection plans in place for the impairment(s)/pollutant(s)\* of interest.
- If priorities are based on a geographic area, then ALL of the impairment(s)/pollutant(s)\* would need to be addressed with a completed TMDL, alternative plan, or protection plan in order to count the catchment.

Topics to discuss:

- Mercury impairments
- New impairments identified in subsequent 303(d) lists
- Priority areas with no impairments

\* The terms impairment and pollutant are often used interchangeably. Generally, we refer to causes of impairment in relation to the states 303(d) list, and pollutants in relation to TMDLs

## Identify Priority Catchments with TMDLs in Cycle A

### Legend

- Waters with TMDLs - Cycle A (Rivers/Streams)
- ☒ Waters with TMDLs - Cycle A (Lakes/Reservoirs)
- ☒ Priority Catchments in TN
- SourceWaterPoints
- SourceWaterBuffers\_ZoneA
- SourceWaterBuffers\_ZoneB

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community



# 1. Identify Catchments with TMDLs Established in 2010 or Before (Cycle A) in Priority Catchments

Table

Priority Catchments\_TN

FID	Shape	OBJECT	GRIDCO	FEATURE	SOURCE	Prior_Cats	TMDL_p2011	AreaSqKM	Shape_Le	Shape_Ar	AreaDiff	DiffPct	303d_201
180	Polygon	763520	229318	4036432	NHDFlowli	Y	Y	0.0855	0.01887	0.000009	0.00030	0.0036	Y
181	Polygon	763521	229319	4037174	NHDFlowli	Y	Y	12.6522	0.262347	0.001274	0.00442	0.0003	Y
182	Polygon	763527	229325	4036448	NHDFlowli	Y	Y	0.1503	0.023704	0.000015	0.00197	0.0131	Y
183	Polygon	763528	229326	4036428	NHDFlowli	Y	Y	0.1017	0.018194	0.00001	0.00036	0.0035	Y
533	Polygon	764755	230564	4034364	NHDFlowli	Y	Y	0.3501	0.03192	0.000035	0.00165	0.0047	Y
141	Polygon	796499	262606	12152712	NHDFlowli	Y	Y	2.1267					
156	Polygon	796679	262788	12152730	NHDFlowli	Y	Y	8.4321					
225	Polygon	797588	263706	10182213	NHDFlowli	Y	Y	2.8899					
341	Polygon	798924	265055	10176951	NHDFlowli	Y	Y	16.263					
341	Polygon	798925	265056	10176205	NHDFlowli	Y	Y	4.842	0.136154	0.000486	0.00420	0.0008	Y
345	Polygon	798963	265095	10176099	NHDFlowli	Y	Y	6.5052	0.163482	0.000653	0.00264	0.0004	Y
455	Polygon	800064	266214	18421197	NHDFlowli	Y	Y	2.7549	0.096829	0.000276	0.00199	0.0007	Y
455	Polygon	800065	266215	18421973	NHDFlowli	Y	Y	3.0564	0.114276	0.000306	0.00447	0.0014	Y
518	Polygon	800689	266843	18424179	NHDFlowli	Y	Y	1.8144	0.089051	0.000181	0.00201	0.0011	Y
521	Polygon	800719	266873	18421109	NHDFlowli	Y	Y	8.9514	0.215212	0.000896	0.00056	0.0000	Y
522	Polygon	800735	266889	18421123	NHDFlowli	Y	Y	0.8937	0.059766	0.000089	0.00209	0.0023	Y
531	Polygon	800822	266976	18423681	NHDFlowli	Y	Y	2.7639	0.10512	0.000275	0.00073	0.0002	Y
534	Polygon	800854	267008	18423645	NHDFlowli	Y	Y	1.3563	0.07001	0.000135	0.00439	0.0032	Y
534	Polygon	800855	267009	18423623	NHDFlowli	Y	Y	0.6075	0.041646	0.00006	0.00170	0.0028	Y
538	Polygon	800893	267048	18423587	NHDFlowli	Y	Y	2.3445	0.090878	0.000233	0.00099	0.0004	Y
541	Polygon	800921	267076	18423553	NHDFlowli	Y	Y	4.1985	0.130832	0.000418	0.00344	0.0008	Y

1 (1050 out of 10884 Selected)

Priority Catchments\_TN

## 2. Calculate Total Area of Selected Catchments

## 303(d) Measures Pilot Process: Step 9

Identified priority impairment(s)/pollutant(s)\* that are still on the State 303(d) list to remove those catchments from consideration

- Need to remove catchments for which impairment(s)/pollutant(s) still need to be addressed by a completed TMDL, alternative plan, or protection plan

\* The terms impairment and pollutant are often used interchangeably. Generally, we refer to causes of impairment in relation to the states 303(d) list, and pollutants in relation to TMDLs

# 303(d) Measures Pilot Process: Step 10

Calculated the total area of catchments identified in Steps 8 and 9, and recorded this information in the computations spreadsheet

Key Performance Measure Computations (WQ-27)		
"Extent of priority areas identified by each State that are addressed by EPA-approved TMDLs or alternative restoration approaches for impaired waters that will achieve water quality standards. These areas may also include protection approaches for unimpaired waters to maintain water quality standards"		
	Number (Acres)	Percent of Total Priority Area
Number of Priority Acres	5,734,071.53	100%
Total watershed area (acres) corresponding to existing TMDLs in the priority areas in reporting cycle A	424,148.32	7%
Based on the number of existing TMDLs in reporting cycle A, estimate a "Target" for the total watershed area (acres) in the priority areas with TMDLs for reporting cycle B	0.00	0%
Total watershed area (acres) corresponding to existing TMDLs in the priority areas in reporting cycle B	524,944.92	9%

# 303(d) Measures Pilot Process: Step 11

State to fill in “targets”

Key Performance Measure Computations		
"Extent of priority areas identified by each State that are addressed by EPA-approved TMDLs or alternative restoration approaches for impaired waters that will achieve water quality standards. These areas may also include protection approaches for unimpaired waters to maintain water quality standards"		
	Number (Acres)	Percent of Total Priority Area
Number of Priority Acres	5,734,071.53	100%
Total watershed area (acres) corresponding to existing TMDLs in the priority areas in reporting cycle A	424,148.32	7%
Based on the number of existing TMDLs in reporting cycle A, estimate a "Target" for the total watershed area (acres) in the priority areas with TMDLs for reporting cycle B	495,451.00*	8%*
Total watershed area (acres) corresponding to existing TMDLs in the priority areas in reporting cycle B	524,944.92	9%

\* For demonstration purposes only



**Identify Priority  
Catchments with  
TMDLs in Cycle B**

**Legend**

- Waters with TMDLs - Cycle A (Rivers/Streams)
- Waters with TMDLs - Cycle A (Lakes/Reservoirs)
- Waters with TMDLs - Cycle B (Rivers/Streams)
- Waters with TMDLs - Cycle B (Lakes/Reservoirs)
- ☞ Priority Catchments in TN
- SourceWaterPoints
- SourceWaterBuffers\_ZoneA
- SourceWaterBuffers\_ZoneB

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community



# 1. Identify Catchments with TMDLs Established in 2012 or Before (Cycle B) in Priority Catchments

Table

Priority Catchments in TN

FID	Shape	OBJECT	GRIDCO	FEATURE	SOURCE	Prior_Cats	TMDL_p2011	TMDL_p2013	AreaSqKM	Shape_Le	Shape_Ar	AreaDiff	DiffPct	30
129	Polygon	822214	733	19754095	NHDFlowli	Y	Y	Y	1.9413	0.091323	0.000195	7.62994	3.9303	
129	Polygon	822227	746	19753217	NHDFlowli	Y	Y	Y	4.6143	0.141854	0.000464	3.99250	0.8652	
130	Polygon	822451	974	19753237	NHDFlowli	Y	Y	Y	1.1988	0.064527	0.000121	1.1923	0.9945	
131	Polygon	822550	1074	19753199	NHDFlowli	Y	Y	Y	1.0809	0.066551	0.000109	0.59483	0.5503	
131	Polygon	822572	1097	19753077	NHDFlowli	Y	Y	Y	1.7658	0.07303	0.000178	2.20191	1.2469	
131	Polygon	822579	1106	19753235	NHDFlowli	Y	Y	Y	0.3033	0.032061	0.000031	0.19330	0.6373	
132	Polygon	822597	1126	19753127	NHDFlowli	Y	Y	Y						
132	Polygon	822630	1160	19754065	NHDFlowli	Y	Y	Y						
132	Polygon	822645	1175	19753201	NHDFlowli	Y	Y	Y						
132	Polygon	822653	1183	19753075	NHDFlowli	Y	Y	Y						
132	Polygon	822659	1189	19754149	NHDFlowli	Y	Y	Y						
132	Polygon	822675	1205	22142928	NHDFlowli	Y	Y	Y	0.1458	0.024017	0.000015	3.38584	23.222	
132	Polygon	822683	1213	22142916	NHDFlowli	Y	Y	Y	0.3501	0.031783	0.000035	1.99533	5.6993	
132	Polygon	822686	1216	22143022	NHDFlowli	Y	Y	Y	2.5002	0.157714	0.00025	12.3622	4.9444	
133	Polygon	822708	1238	22144242	NHDFlowli	Y		Y	4.3623	0.123246	0.000434	3.42105	0.7842	Y
133	Polygon	822710	1240	22144244	NHDFlowli	Y		Y	1.8513	0.073454	0.000184	1.13723	0.6142	Y
133	Polygon	822711	1241	22142920	NHDFlowli	Y	Y	Y	0.4464	0.041981	0.000045	2.52431	5.6548	
133	Polygon	822754	1285	22142940	NHDFlowli	Y	Y	Y	0.0729	0.015826	0.000007	6.35351	87.153	
133	Polygon	822757	1288	22144246	NHDFlowli	Y		Y	2.8062	0.091063	0.000279	2.09856	0.7478	Y
133	Polygon	822761	1292	22142944	NHDFlowli	Y	Y	Y	1.1547	0.078216	0.000115	0.48616	0.4210	
134	Polygon	822796	1327	22142934	NHDFlowli	Y	Y	Y	2.5947	0.129664	0.000259	3.75180	1.4459	
134	Polygon	822869	1400	22144216	NHDFlowli	Y		Y	3.5442	0.124348	0.000353	1.79240	0.5057	Y
134	Polygon	822876	1407	22142950	NHDFlowli	Y	Y	Y	0.0594	0.012872	0.000006	0.52935	8.9116	
134	Polygon	822879	1410	22143584	NHDFlowli	Y	Y	Y	0.297	0.027873	0.00003	1.41132	4.7519	

1 (1394 out of 10884 Selected)

Priority Catchments in TN

2. Calculate Total Area of Selected Catchments

# 303(d) Measures Pilot Process: Step 12

## Repeated Steps 8, 9, and 10 for Cycle B

- Step 8: Identified priority catchments that contain waters with completed TMDLs, alternative plans, or protection plans for Cycle A
- Step 9: Identified priority impairment(s)/pollutant(s) that were still on the State 303(d) list to remove those catchments from consideration
- Step 10: Calculated the total area of catchments identified in Steps 8 and 9, and recorded this information in the computations spreadsheet

Key Performance Measure Computations (WQ-27)		
"Extent of priority areas identified by each State that are addressed by EPA-approved TMDLs or alternative restoration approaches for impaired waters that will achieve water quality standards. These areas may also include protection approaches for unimpaired waters to maintain water quality standards"		
	Number (Acres)	Percent of Total Priority Area
Number of Priority Acres	5,734,071.53	100%
Total watershed area (acres) corresponding to existing TMDLs in the priority areas in reporting cycle A	424,148.32	7%
Based on the number of existing TMDLs in reporting cycle A, estimate a "Target" for the total watershed area (acres) in the priority areas with TMDLs for reporting cycle B	0.00	0%
Total watershed area (acres) corresponding to existing TMDLs in the priority areas in reporting cycle B	524,944.92	9%

# Benefits of Catchment Approach

## Simplifies tracking of site-specific outcomes

- Restoration progress for individual impaired waters and priority watersheds
- Protection of healthy waters
- Improvements co-located with implementation of TMDLs, 319 grants, etc.

## Improves tracking output measures (i.e., 303(d) Program measure, 319 measure)

## Resolves challenges tracking current measures

- Reduces amount of manual tracking of TMDL progress
- Addresses issues of overlapping assessment units and variable size of assessment units
- Facilitates cycle-to-cycle tracking

## More transparent and results can be tracked back to an official 'system-of-record'

## Allows for better cross-program integration

## Faster and cheaper data processing costs for both states and EPA

# Lessons Learned

This process works, and we are moving in the right direction

Suggestions for improving the methodology to automate the calculation of these measures

- State data consistency
  - Assessment unit ID in the GIS features needs to match the Assessment unit ID in the 303(d) and 305(b) data
  - Generally problems with the TMDL data
- Consistent unit (automated process)
  - Use either sq km or add a field to the catchments layer to convert the area from sq km to acres
- Variation in NHD Catchments
  - Known issue; however, something for folks to continue to keep in mind

# Topics for Further Discussion

Discuss process to calculate universe, baseline, and targets

- Assumptions/Process if state does not set long-term priorities
- Assumptions/Process if state changes priorities

Address Region and state concerns about impacts to state Rotating Basin Approach

Discuss ATTAINS Redesign

- Standardize terminology
- Standardize how to describe priority areas
- Available resources

Discuss EPA support in the calculation of these measures

- Automation

Update the measures computational guidance

- Define protection
- Define alternative restoration approach

Discuss process to calculate the complementary (indicator measure – WQ-28)

- Mid to late May

Set-up meetings with individual states and Regions to discuss pilot results

- May and June

# Timeline

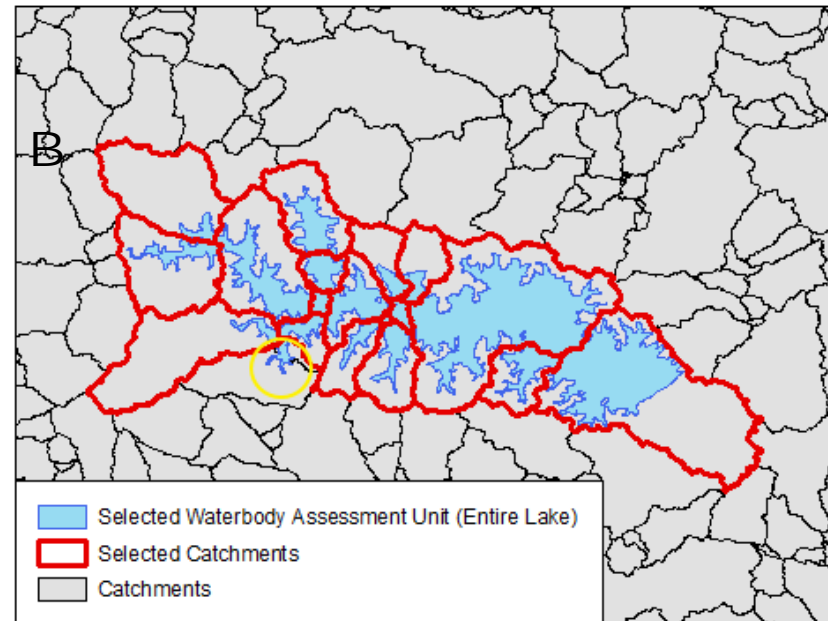
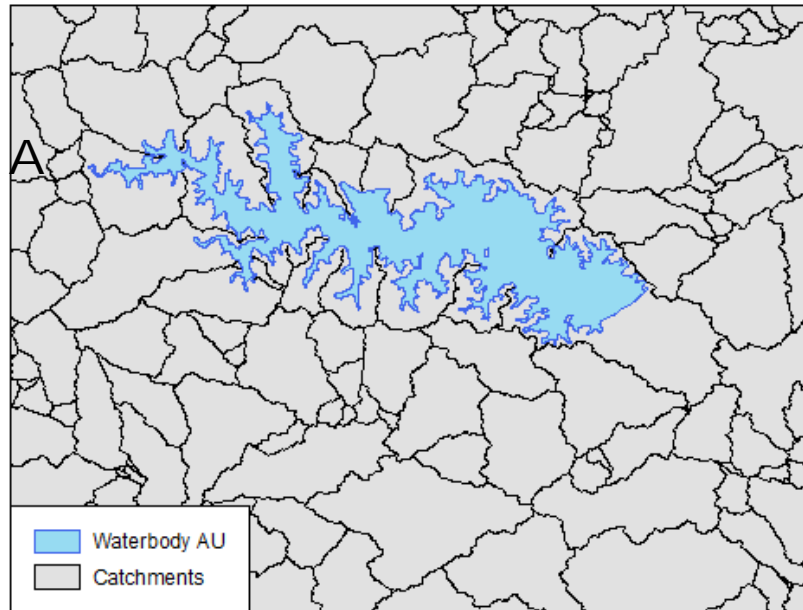
Activity	Date
Finalize Pilots (EPA and States)	January to March 2014
Discuss results with Pilot States	April 2014
Reconvene measures workgroup to discuss results of the Pilot and discuss changes to draft computational guidance	April 2014
Discuss measures at the State and EPA meetings	May 2014
Finalize computational guidance	June 2014
EPA and States work to develop and finalize FY 15 draft targets (WQ-27)	June/July 2014

# Appendix

# Additional Information on Integrated Reporting Geopilot Prototypes



# Area Waterbody to Catchment Prototype



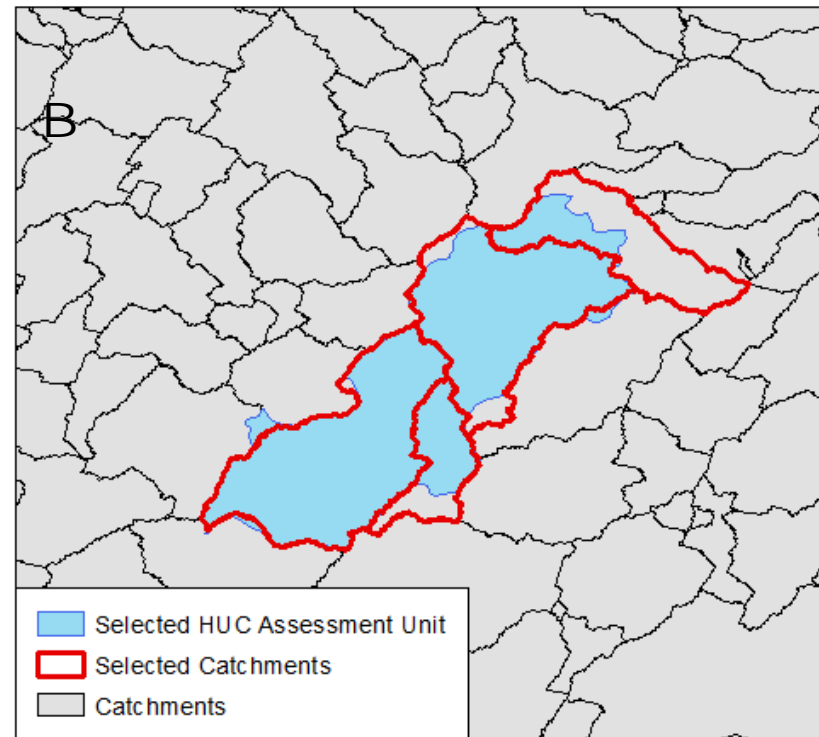
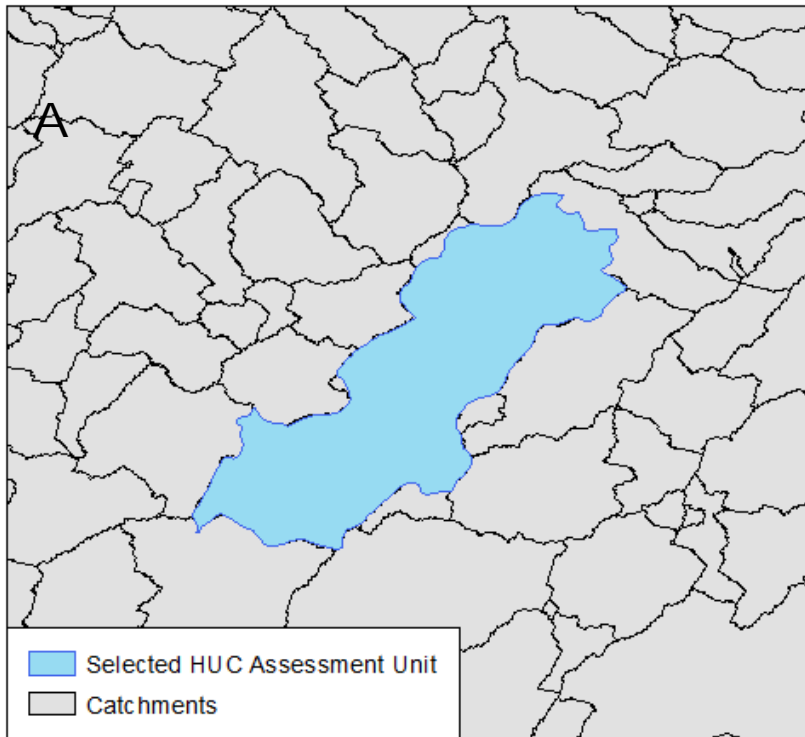
**Results: Final Catchments associated with the selected Waterbody Assessment Unit**

The Area Waterbody to Catchment prototype is simpler than the Linear to Catchment prototype, and a little less accurate.

The Area Waterbody to Catchment prototype uses an intersection of the waterbody with the catchments, and then looks at the percentage of the waterbody in the catchment, and the percentage of the catchment covered by the waterbody. It also looks at whether the catchment is designated as an Artificial Path according to NHDPlus.

This prototype tends to miss some catchments such as the area circled in yellow. The area circled in yellow shows a portion of the waterbody where catchments were not associated with the waterbody because they did not meet the requirements: the pieces were smaller than the threshold used, and they were not part of an NHD artificial path.

# HUC-like to Catchment Prototype



**Results: Final Catchments associated with the selected HUC Assessment Unit.**

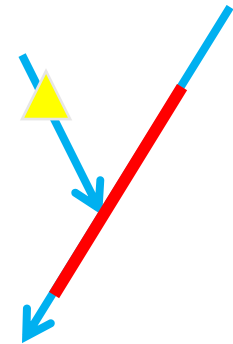
The HUC-like to Catchment prototype is simpler than the Linear or Area Waterbody to Catchment prototypes, and a little less accurate.

The HUC to Catchment prototype uses an intersection of the waterbody with the catchments, and then looks at the percentage of the waterbody in the catchment, and the percentage of the catchment covered by the waterbody. Unlike the Area Waterbody to Catchment prototype, it does not use an Artificial Path attribute

In some cases the HUC-like prototype overestimates size by picking up catchments that visually look like they shouldn't be included, and in other cases it underestimates size by not picking up other catchments. It seems to depend on how closely the HUC-like assessment units align with Watershed Boundary Dataset HUC12s.

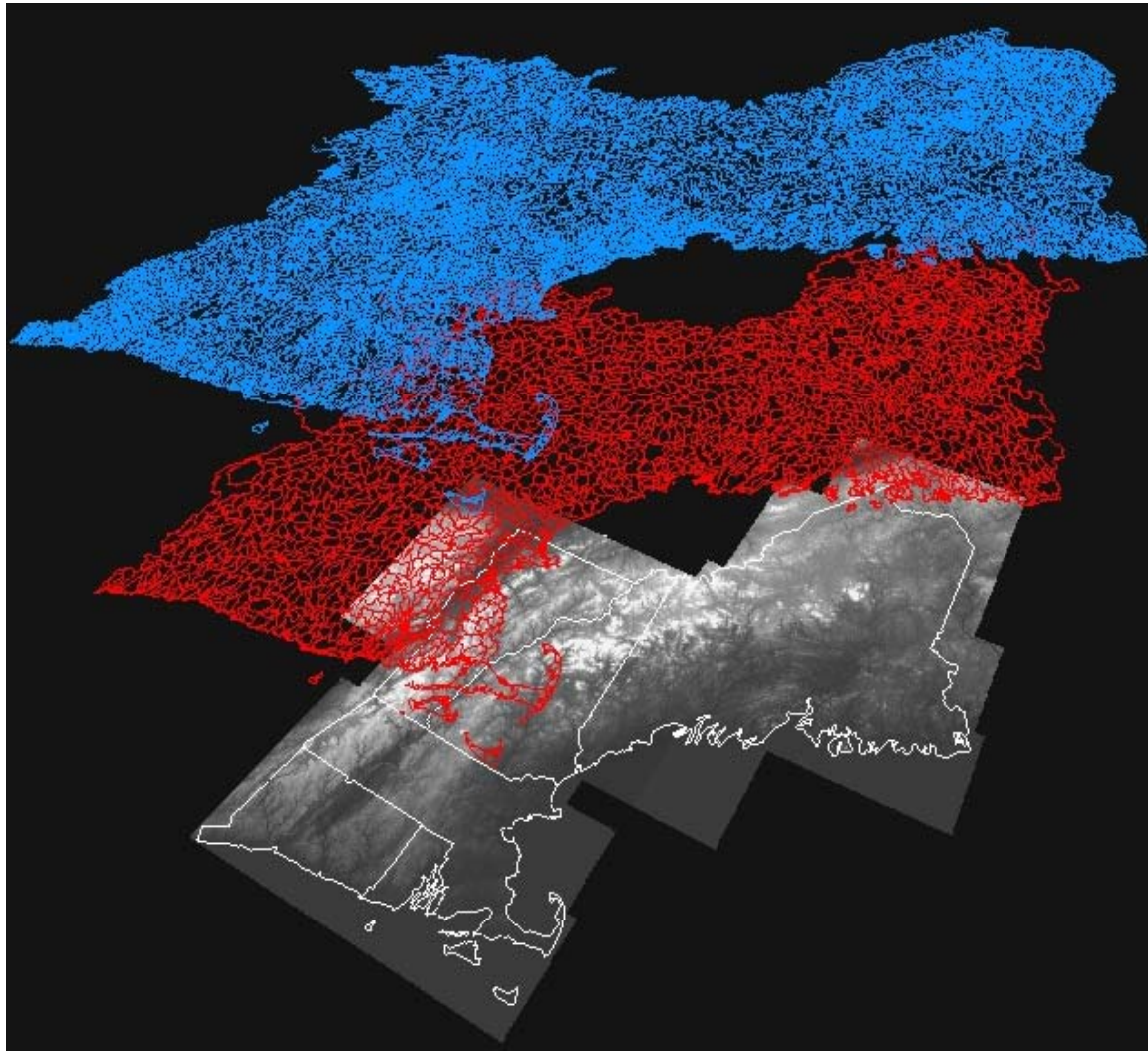
# Additional Information on the National Hydrography Dataset Plus (NHDPlus) and Catchments

# National Hydrography Dataset Plus (NHDPlus)



- NHD based upon concepts from EPA Reach File 1 (RF1)
  - Stream network with stream addresses
- Medium resolution NHD (1:100,000-scale) developed by EPA and USGS-Mapping (2000)
- NHDPlus developed by EPA and USGS-Water (2006) to provide flow volume and velocity estimates for pollution dilution modeling
  - Builds upon NHD stream network – integrated with elevation and HUC12s
  - Additional stream attributes (stream order, flow, etc)
  - Catchments and attributes (precipitation, temperature, land cover)
- Success of initial version led to much-improved NHDPlus Version 2 (2012)

# NHD*Plus* Concepts: Integration of NHD, WBD, and NED



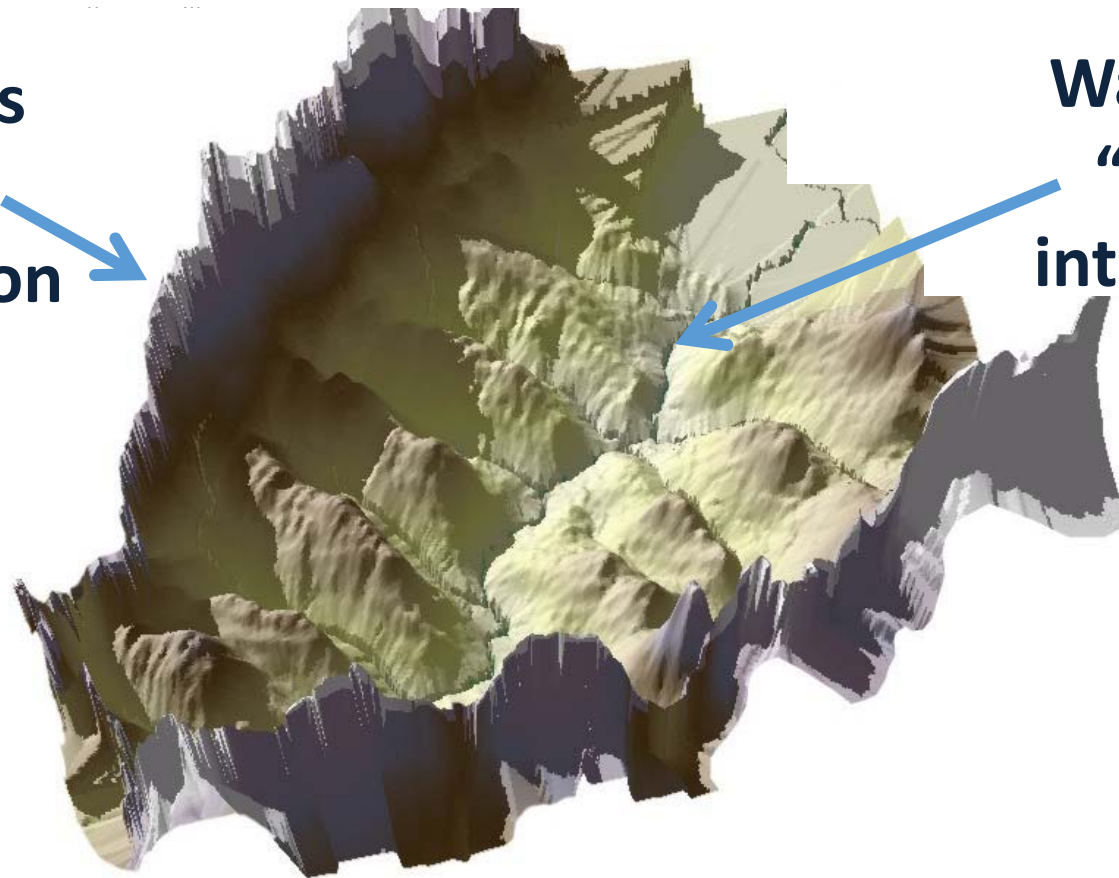
**National  
Hydrography  
Dataset (NHD)**

**Watershed  
Boundary  
Dataset (WBD)**

**National  
Elevation  
Dataset (NED)**

# NHDPlus Concepts: Integration of NHD, WBD, and NED

**WBD  
Boundaries  
“walled”  
into Elevation**



**NHD Streams  
and  
Waterbodies  
“burned”  
into Elevation**



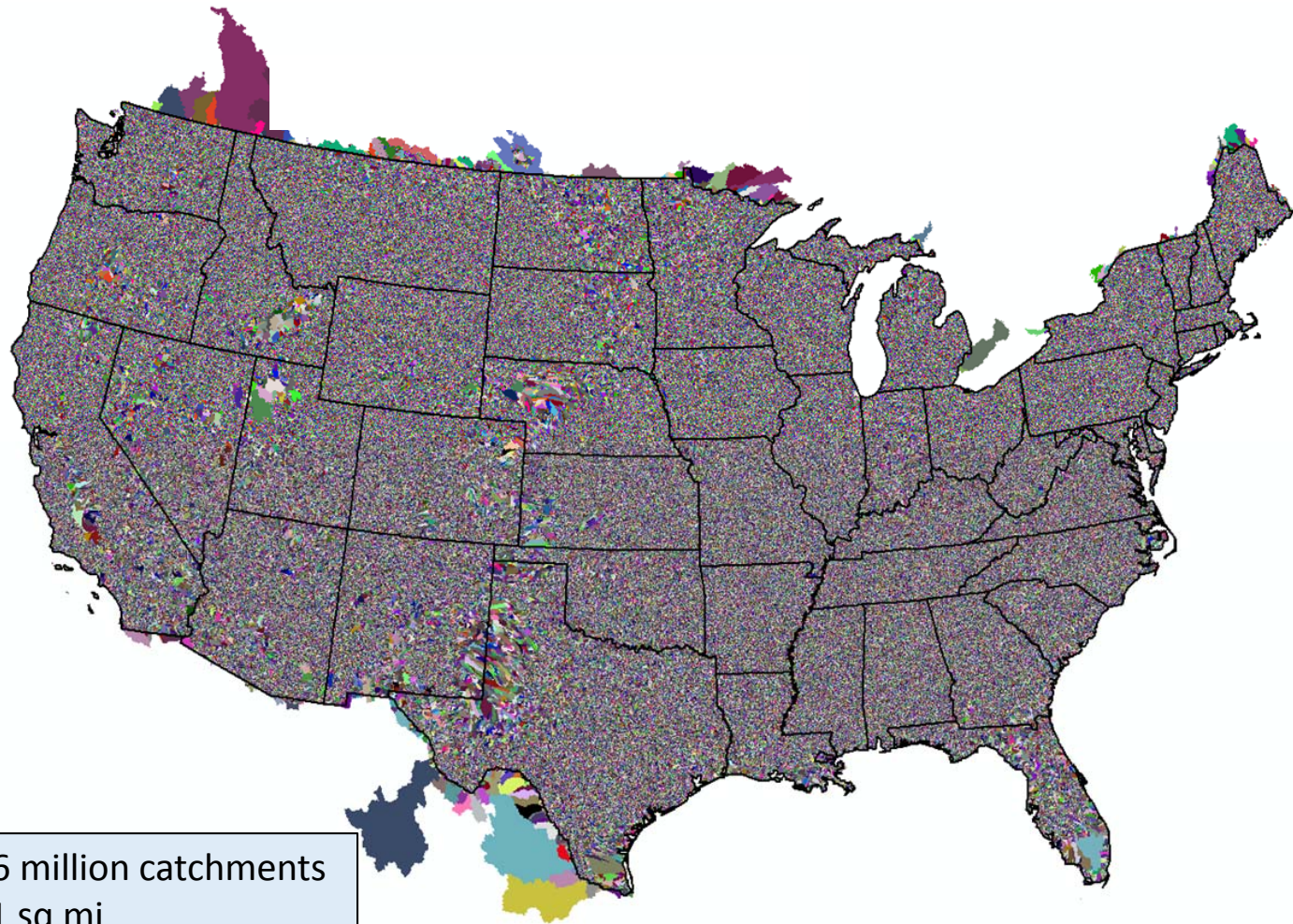
NHDPlus Concepts:  
*Link the Landscape to the Stream Network*



**Catchment: Land Surface that Drains to Each Stream Segment**

# NHDPlus Concepts: V2 Catchments

Catchments as of June 14, 2012

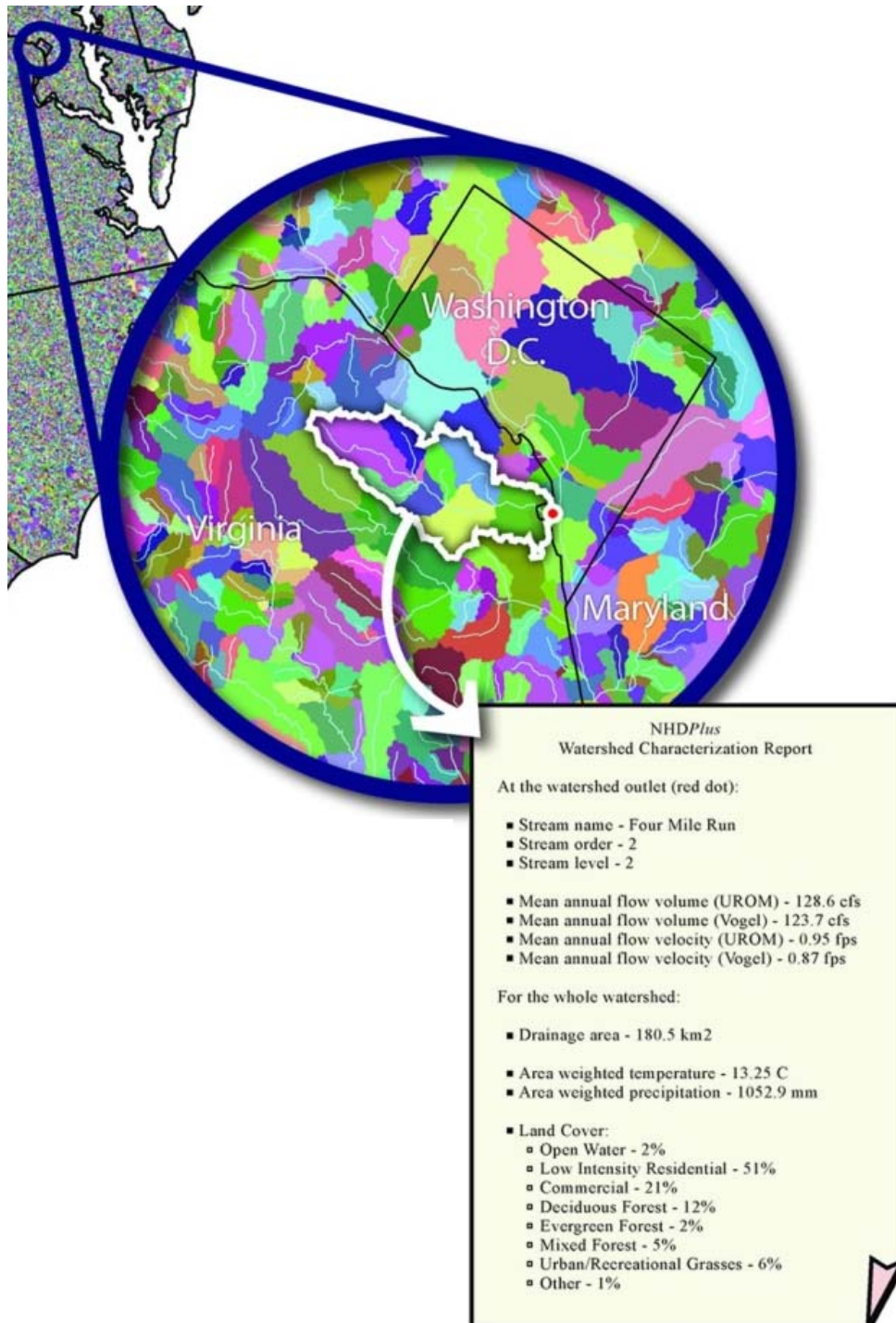


- Approximately 2.6 million catchments
- Average size is 1.1 sq mi
- Significant range in size, but 99% of catchments are smaller than 15 sq mi

Source:  
R.Moore (USGS)

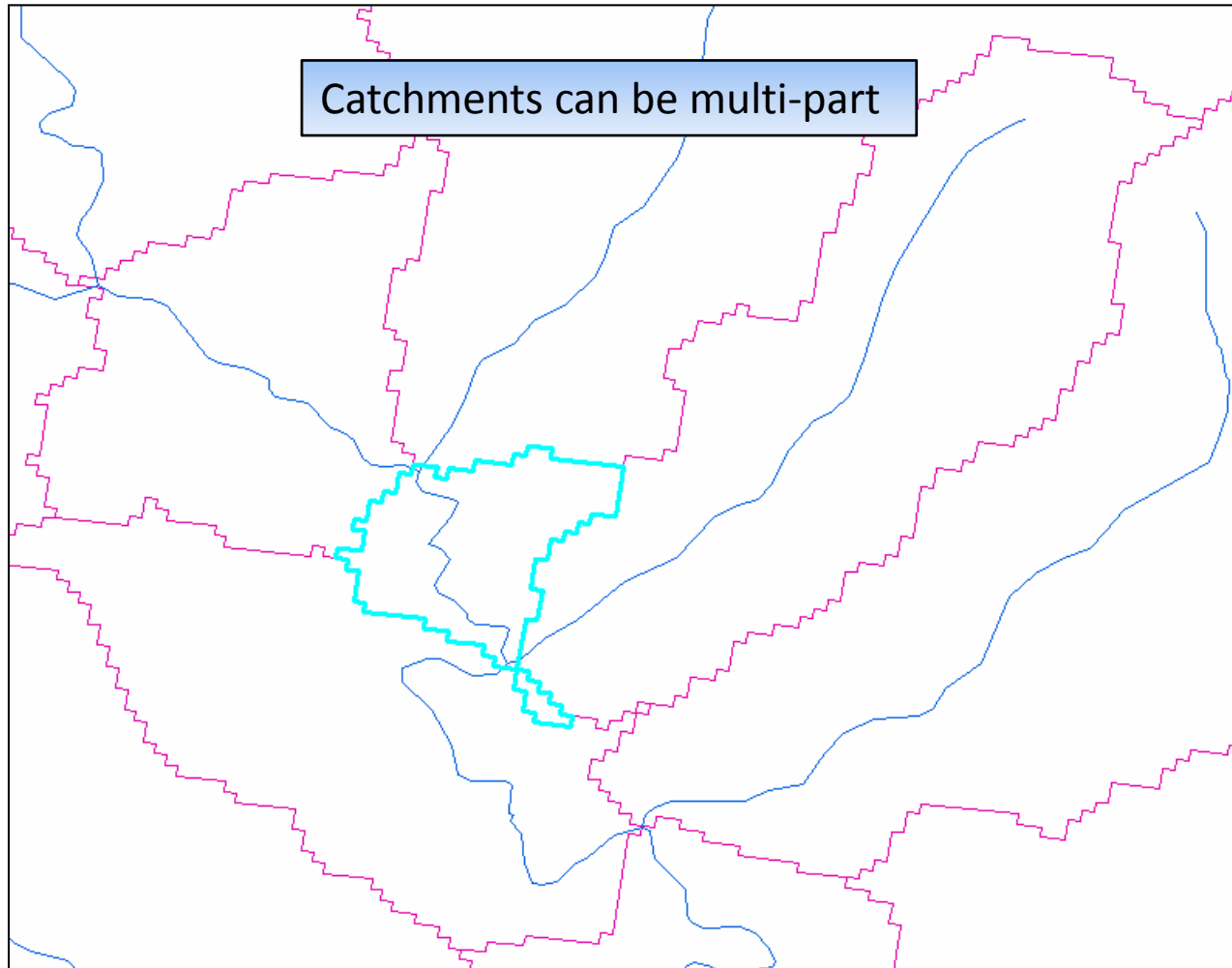


# NHDPlus Concepts: Watershed Delineation and Attributes

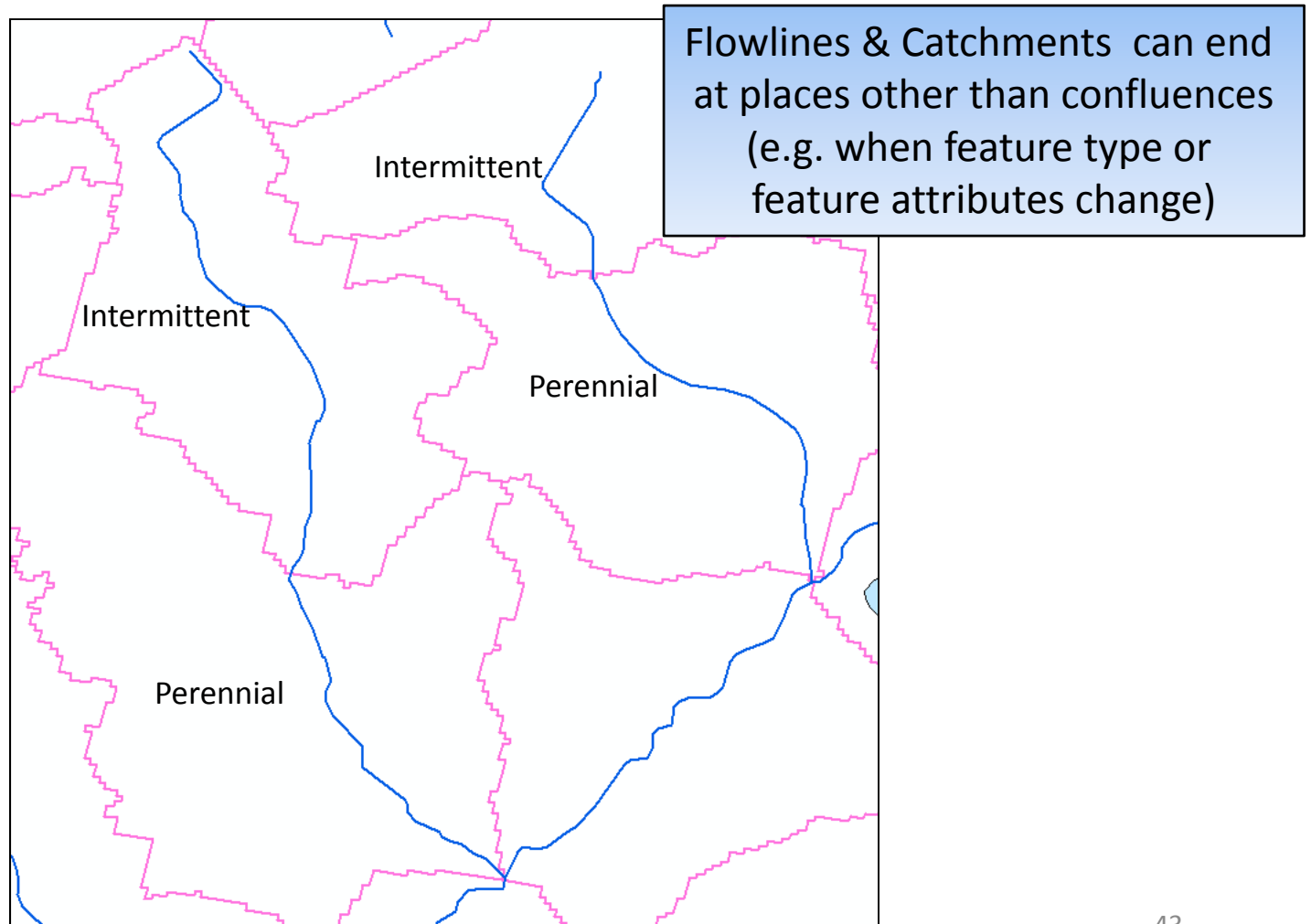


The inset map shows the watershed (white boundary) defining the drainage area upstream from the mouth of Four Mile Run (red dot) and a report of associated watershed characteristics – both produced using NHDPlus. The underlying NHD network identifies the upstream catchments that comprise the watershed.

# NHDPlus Concepts: *Catchment Facts*

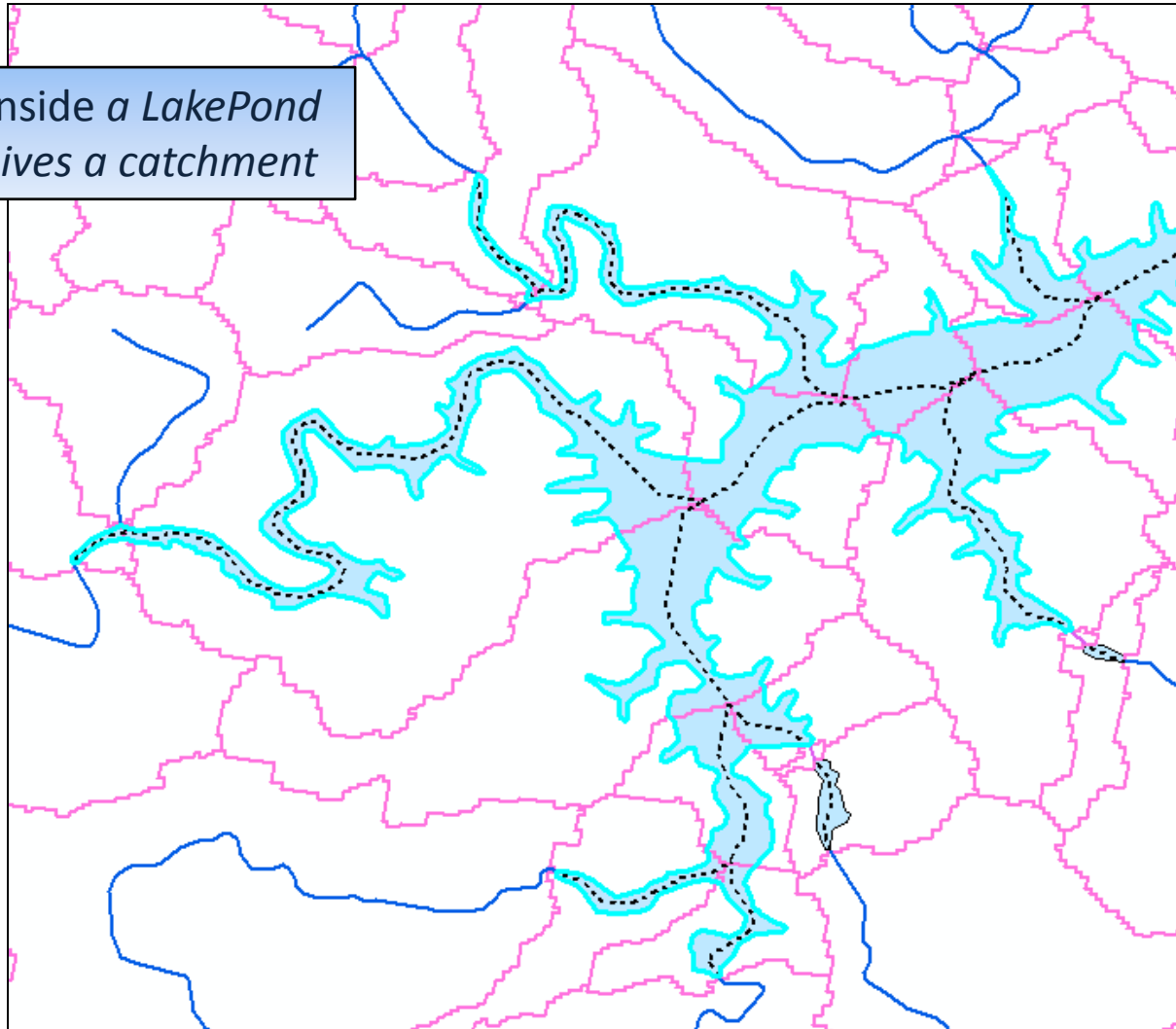


# NHDPlus Concepts: Catchment Facts

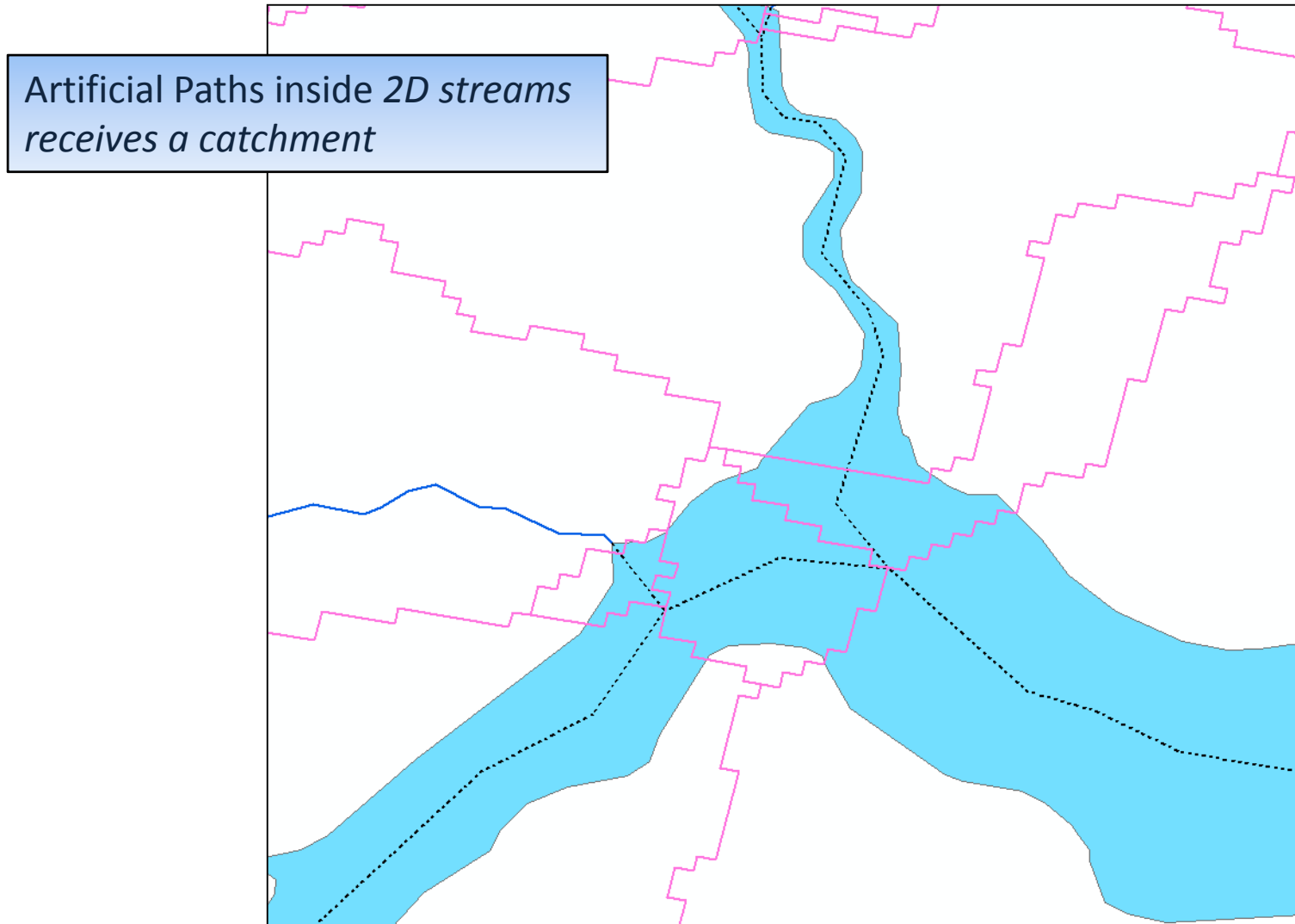


# NHDPlus Concepts: Catchment Facts

Artificial Paths inside a *LakePond*  
Waterbody receives a catchment



# NHDPlus Concepts: Catchment Facts



# NHDPlus Concepts: *Catchment Facts*

- Total Coastline Features: 23,590
- Total Coastline Catchments: 23,177
- Define areas that drain to the coast
- Are not connected to the network

