West Virginia Assessment Unit Redesign

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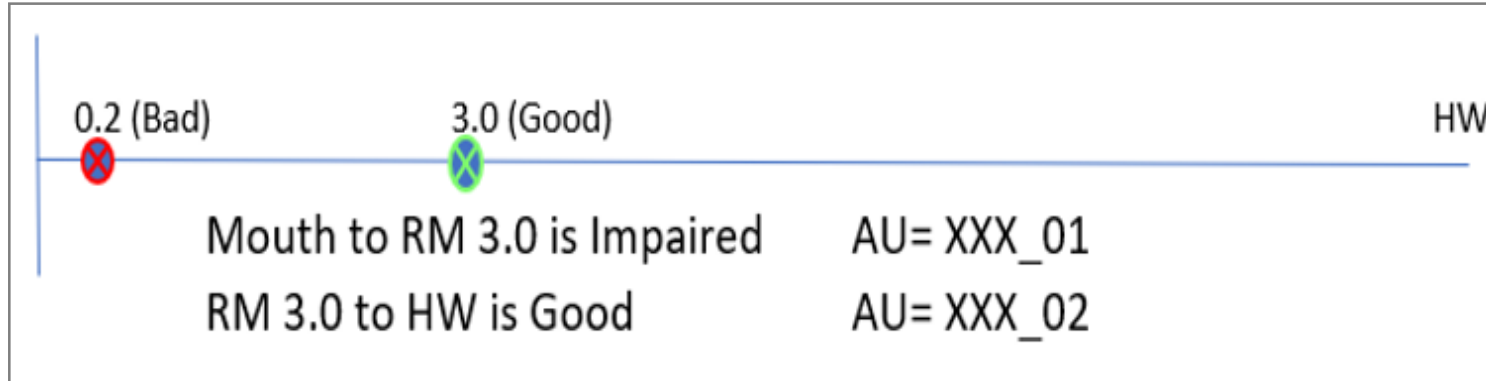# Why did we decide to re-segment streams?

ATTAINS

Old Segmentation

- Old Assessment Unit (AU) methodology - Cycle Dependent/New cycle new AUs

- Changing of the AUs did not matter - AUs not consistent

- Three reasons for segmentation:

  o Designated Use change – ex. partial trout

  o Variances in the WQS for only part of the stream

  o Generally – Based on stream monitoring data results Segmented when station data gave different attainment results
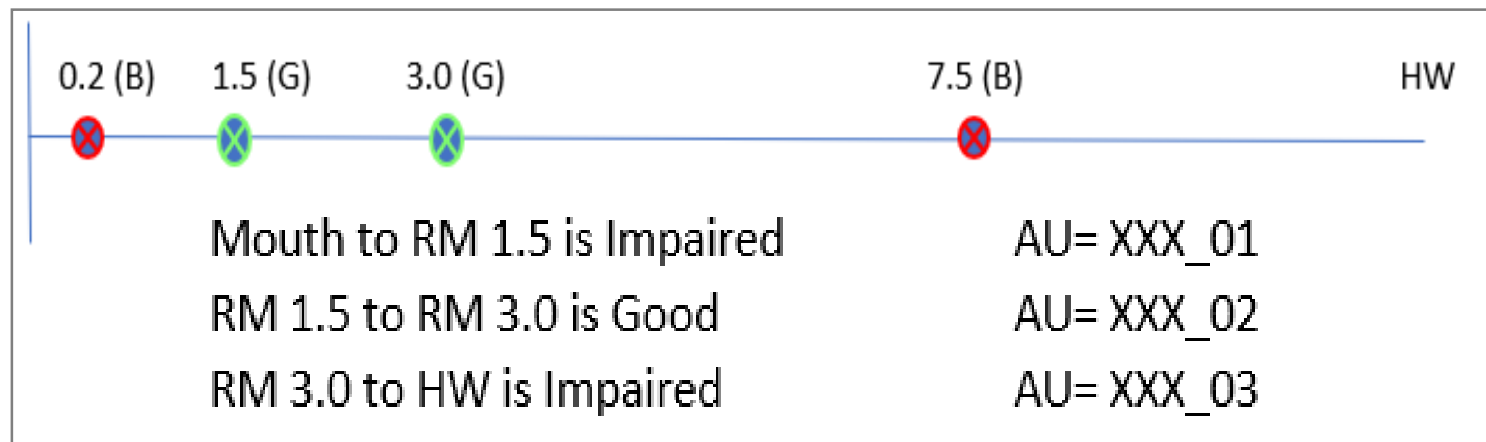
One Station – entire length – AU ended with _00

Two Stations - with different calls

0.2 (Bad)   3.0 (Good)   HW

Mouth to RM 3.0 is Impaired   AU= XXX_01
RM 3.0 to HW is Good   AU= XXX_02

NEW CYCLE – More Data - changes in segmentation

0.2 (B)   1.5 (G)   3.0 (G)   7.5 (B)   HW

Mouth to RM 1.5 is Impaired   AU= XXX_01
RM 1.5 to RM 3.0 is Good   AU= XXX_02
RM 3.0 to HW is Impaired   AU= XXX_03

Along comes ATTAINS:

- NEW Methodology – AUs NOT cycle dependent

- RETIREMENT of AUs - once retired the same AUs could not be used again

- NEW methodology - AUs stay relatively consistent

CHANGE IS <u>NOT</u> <u>GOOD</u> for ASSESSMENT UNITS

- We knew we had to come up with a **New Way to Segment**

Using the NHD for Segmenting

- Process began Mid 2018 and a draft Assessment Unit coded NHD was completed Early 2021 – 2 ½ +years

- Why did it take so long?

  - Three versions of NHDs were involved

  - Earliest version had the original 24K stream codes/latest version had complete overhaul done

  - Several thousand lines were changed or added – code conversion was often either wrong or blank for these

 - Staffing issues – New hires (twice) – lack of knowledge – steep learning curve

Preparing the NHD - delays

- Stream Codes - most important to get right – AUs were based on the codes

  - o Realized the need to identify ponds/lakes/impoundments (waterbody)

  - o Also classified lines as:

    - ▪ Braids

    - ▪ Impounded streams

    - ▪ Backwaters

    - ▪ Taglines

- Once Coded – could begin the segmentation process

While preparing NHD – some issues to address

- Valley Fill coding – changes in lines around Valley Fill – approx. 2000 segments
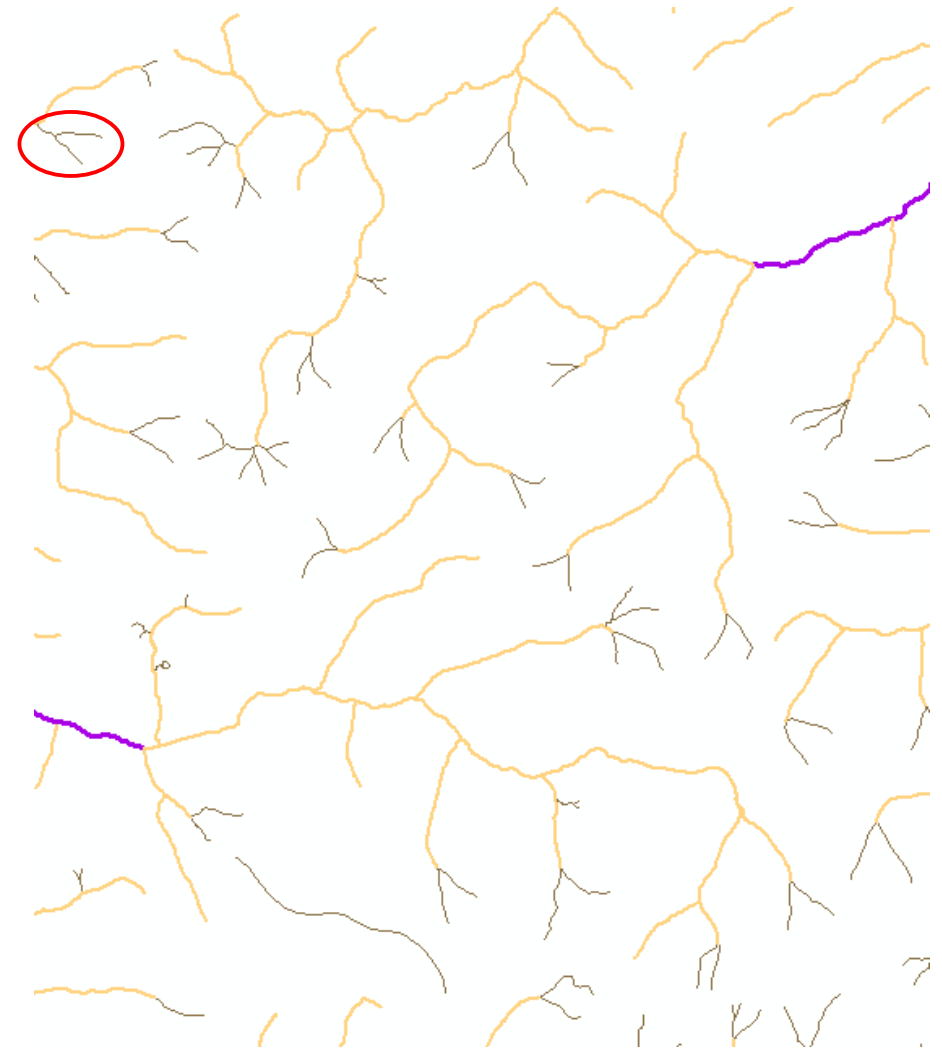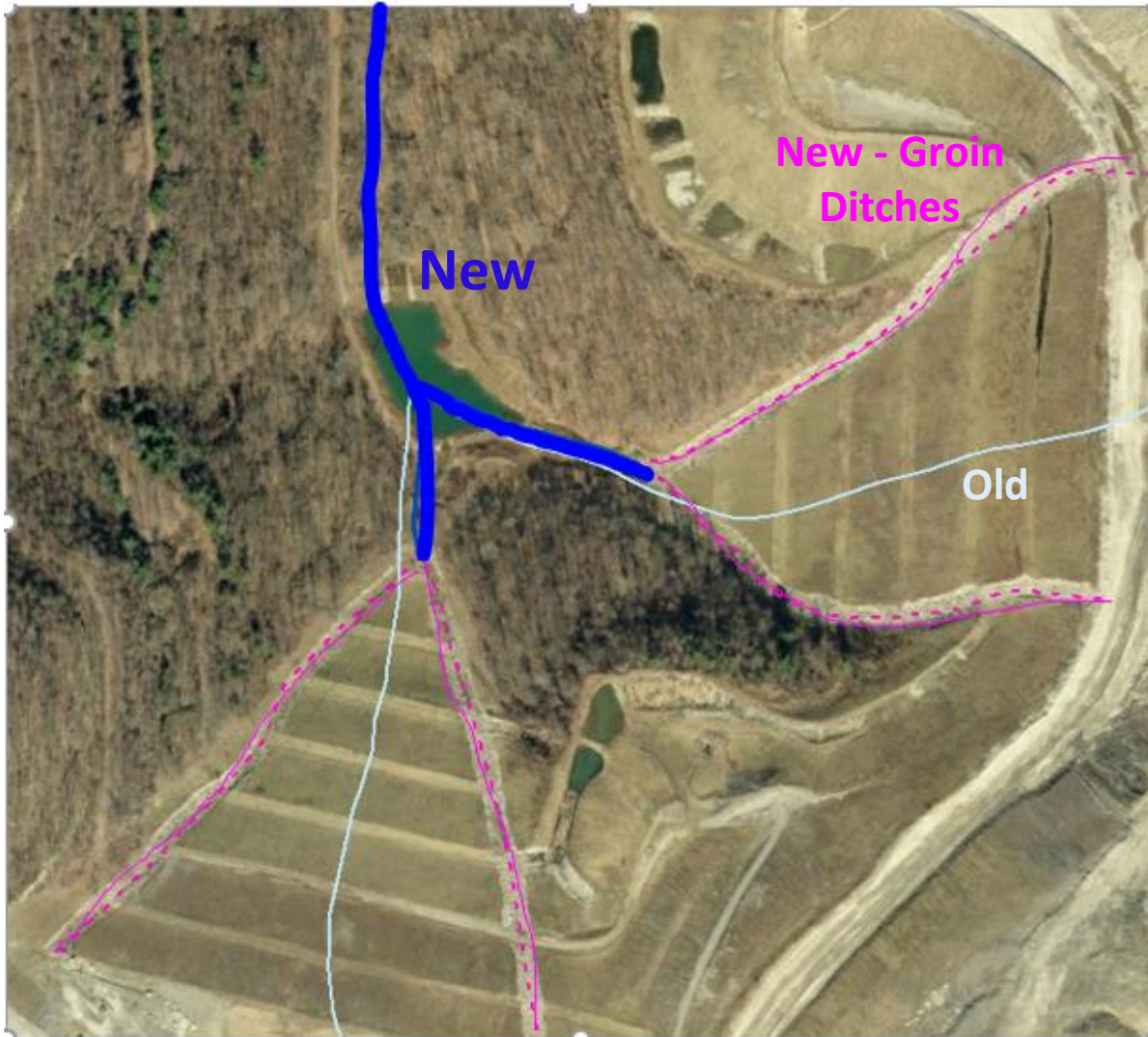
While preparing NHD – some issues to address

- Ponds/lakes/impoundments -
Where are they? How could they impact segmentation? What criteria to use if change stream segmentation above and below?

What factors did we use to determine WHERE to segment the streams?

- **Drainage area** – a layer with drainage areas at the pourpoints of 1:24K line segments existed for an older version of the NHD
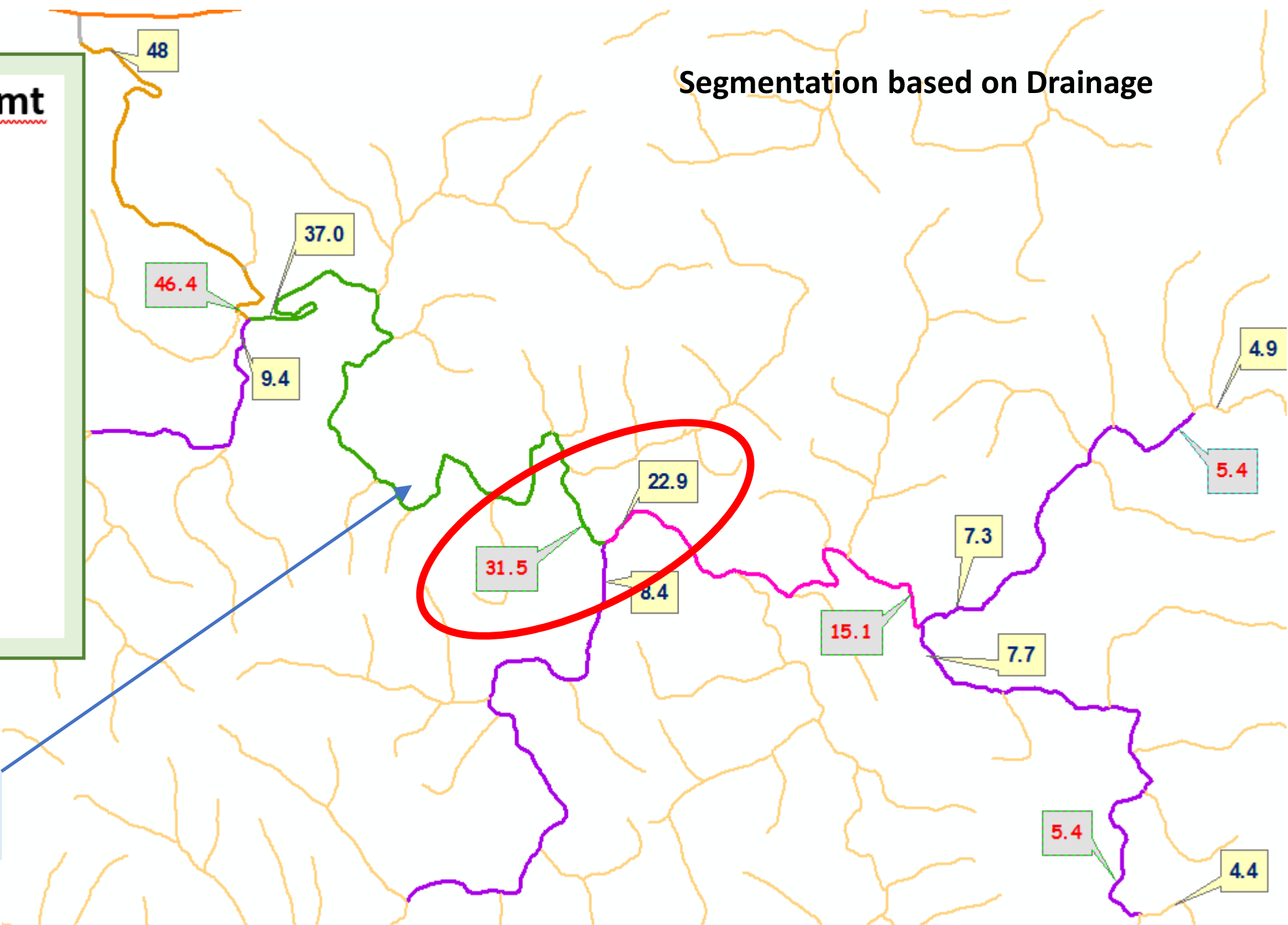
Drainage		Segment
0 - 5.0 sq mi	→	_01
5.1 - 12.5 sq mi	→	_02
12.6 - 25 sq mi	→	_03
25.1 - 50 sq mi	→	_04
50.1 - 100 sq mi	→	_05
and so on		

Segmentation based on Drainage

Drainage Sq mi	Segmt #
0-5	1
5.1-12.5	2
12.6-25	3
25.1-50	4
50.1-100	5
100.1-200	6
and so on	

48

37.0

46.4

9.4

4.9

5.4

22.9

31.5

8.4

7.3

15.1

7.7

AU-XXX_04

5.4

4.4

Other factors considered for segmenting

- TMDL model subwatershed boundaries –
  Aim for TMDL SWS to have only ONE Assessment Unit code

- Not possible with very large SWS or poorly delineated SWS

- Length of stream segments
- Changes in Designated Use
- Land Use
- WQ Stations/data

SWS delineation
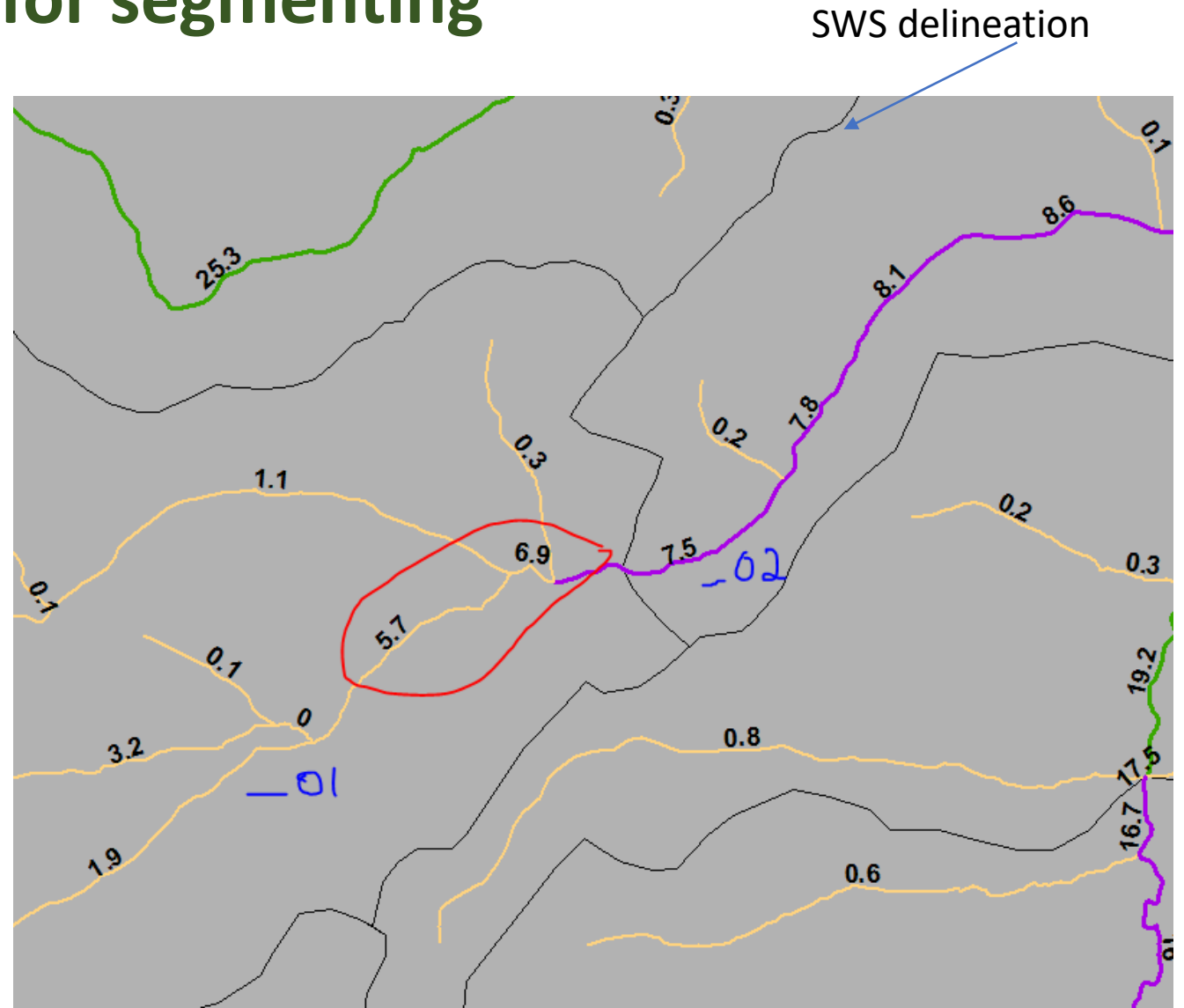
How does this Change affect WORK?

- Change in Assessment Methodology
  - If data at a station within an AU that indicates non-attainment, the entire AU is considered impaired
  - What if there are 2 or more stations within the AU that give contradicting results?
  - Measuring WQ improvements may be more difficult
- Location where streams are segmented -
  - play a significant role in developing Monitoring Plans
  - be considered during the delineation process in TMDL development

Cons

- Possibly inaccurate assessments - multiple stations within AU with conflicting results

- Some mid-stream AUs with no data will say UNASSESSED

- Inconsistencies in some of the converted AU assessments - "retrofitting" the old AUs to the new AUs was not always "clean"
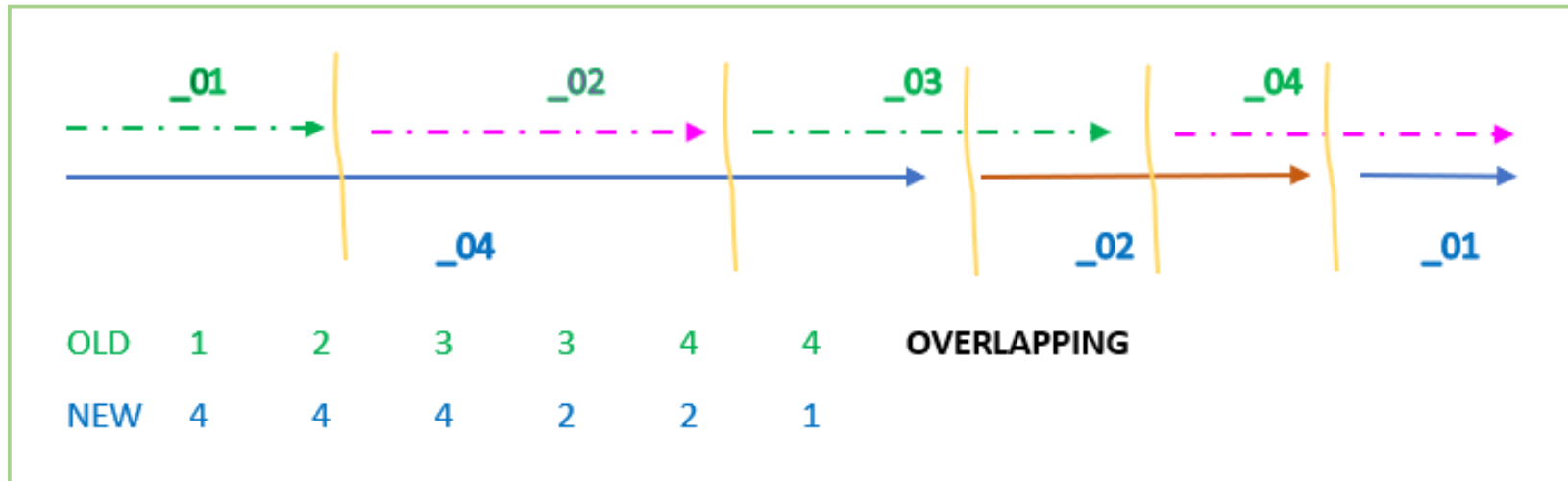
- Need new Decision Database that is structured based on the ATTAINS Methodology

- Focuses on Uses – not been a major part of our assessment process

Benefits

- Data management - easier to tie things together to a consistent AU

- TMDLs and Assessments fit tightly together now

- Opportunity to reach other program goals

  o   Move to 1:24K code system

  o   Get handle on ponds/lakes/impoundments

  o   Review designated uses – trout

- ADDED VALUE:
  o Classified Stream segments
  o Stream Lengths based on NHD and more accurate due to identifying lines that are inundated
  o More descriptive location descriptions
  o US/DS miles for AUs
  o Border and Inundated streams identified and more correctly sized
  o and more

- Using a much more Accurate NHD as GIS base layer

- Most important Benefit - Makes **MY** life much easier!

Would we do it over again – would we do anything different?

- **YES - Absolutely**

- Key - have all necessary information ready and not have to develop first

  - NHD that we would be using was ready and coded

  - Drainage areas for this NHD was already calculated and added

  - Having a better handle on Valley Fills and groin ditches

  - Having the necessary info for ponds/lakes/impoundments

MISCELLANEOUS INFORMATION

Streams:
Assessment Units – Before   - 11991
                              Now   - 46991

Lakes:
Assessment Units – Before   - 132
                              Now   - 415

Added attributes to the NHD:

Segment Type – ponds/lakes/impoundments (lake), braids, streams, sinking streams, backwash, non-jurisdictional, not coded (no AUID), taglines, out of state
Trout Extent – if trout for entire or partial
Trout Length- descriptive
Lake size – eventually but not yet

- Within the codes and names of the streams- can identify if the stream line is inundated and by what lake

Have Descriptive Locations for all Assessment Units
Have an upstream and downstream milepoint for all AUs
Identified Streams Crossing border and miles
Waterbodys are measured

- Above Lake at RM 12.6 to RM 28.6
- Above Impoundment at RM 0.1 to HW
- RM 0.27 and above Lake at RM 0.53 to HW
- Above Lake at RM 1.3 to WV/VA border at RM 4.8
- Above Pond at RM 0.3 to HW
- Entire length
- Above Lake at RM 4.5 to Pond at RM 6.6 and above Pond at RM 6.8 to HW
- Above Lake to HW
- Mouth to Impoundment at RM 5.0 and above Impoundment at RM 5.4 to HW
- Mouth to Lake at RM 0.3 and above Lake at RM 1.2 up 0.2 miles to WV/PA border
- Mouth to RM 0.5 (backwater)
- Mouth to RM 18.1
- Mouth to WV/PA border at RM 7.6
- Mouth to WV/VA border at RM 0.6
- Belleville L&D at MP 203.9 to Racine L&D at MP 237.6
- MP 40 (WV/PA Boundary) to New Cumberland L&D at MP 54.4
- Re-entry at WV/MD border at RM 132.5 to Lake at RM 133.2 and above Lake at RM 133.4 to HW
- RM 36.2 to Forks
- RM 10.0 to Lake at RM 10.3 and above Lake at RM 10.4 to HW
- RM 2.8 to RM 4.7
- RM 23.3 to WV/VA border at RM 34
- WV/VA border at RM 2.3 to HW