

**RELEVANCE:
NEED TO LINK ECOLOGICAL
RESPONSES (E.G., EPT RICHNESS) AND
FLOW DEFICITS (I.E., QUANTILE
REGRESSIONS) TO ECOLOGICAL
CONDITION**

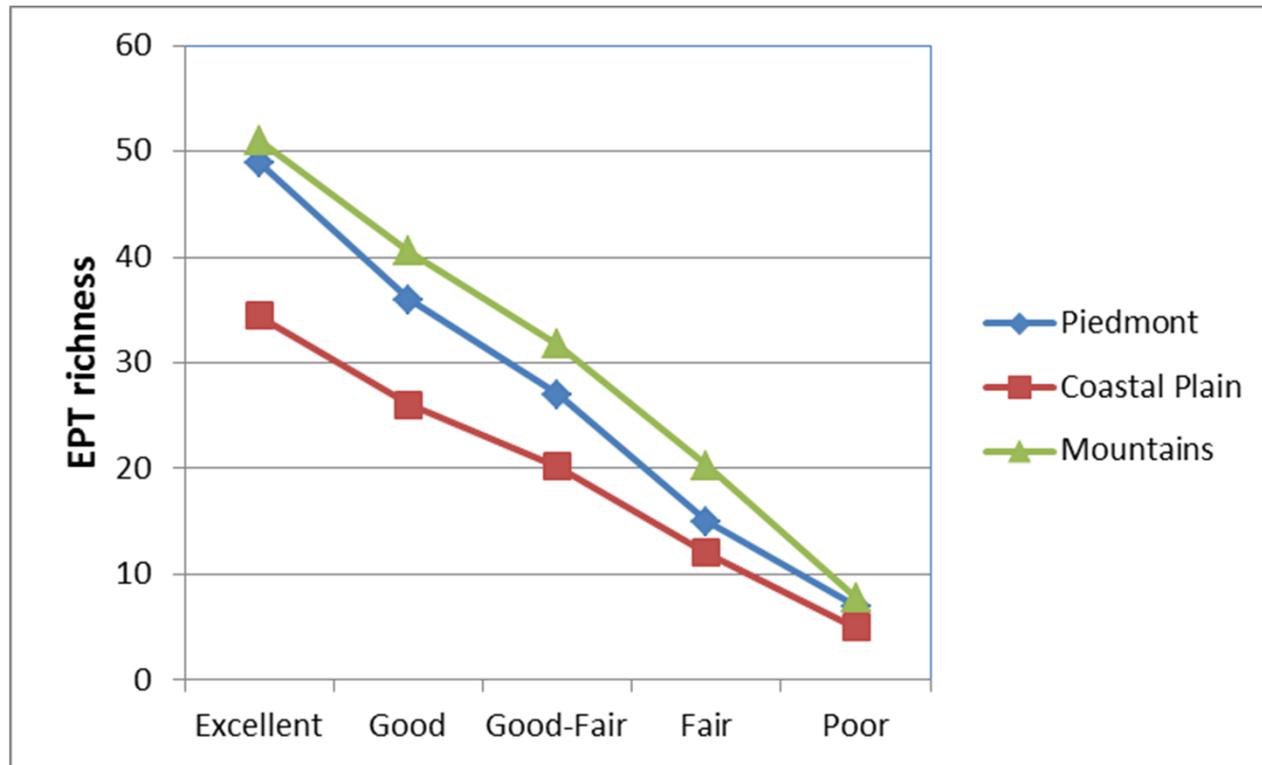
DWQ HAS ESTABLISHED INVERTEBRATE CONDITION CLASSES BASED ON EPT TAXA RICHNESS

- DWQ uses EPT richness as one means of establishing condition classes:

	Mountain	Piedmont	Coastal Plain
Excellent	>35	>27	>23
Good	28-35	21-27	18-23
Good-Fair	19-27	14-20	12-17
Fair	11-18	7-13	6-11
Poor	0-10	0-6	0-5

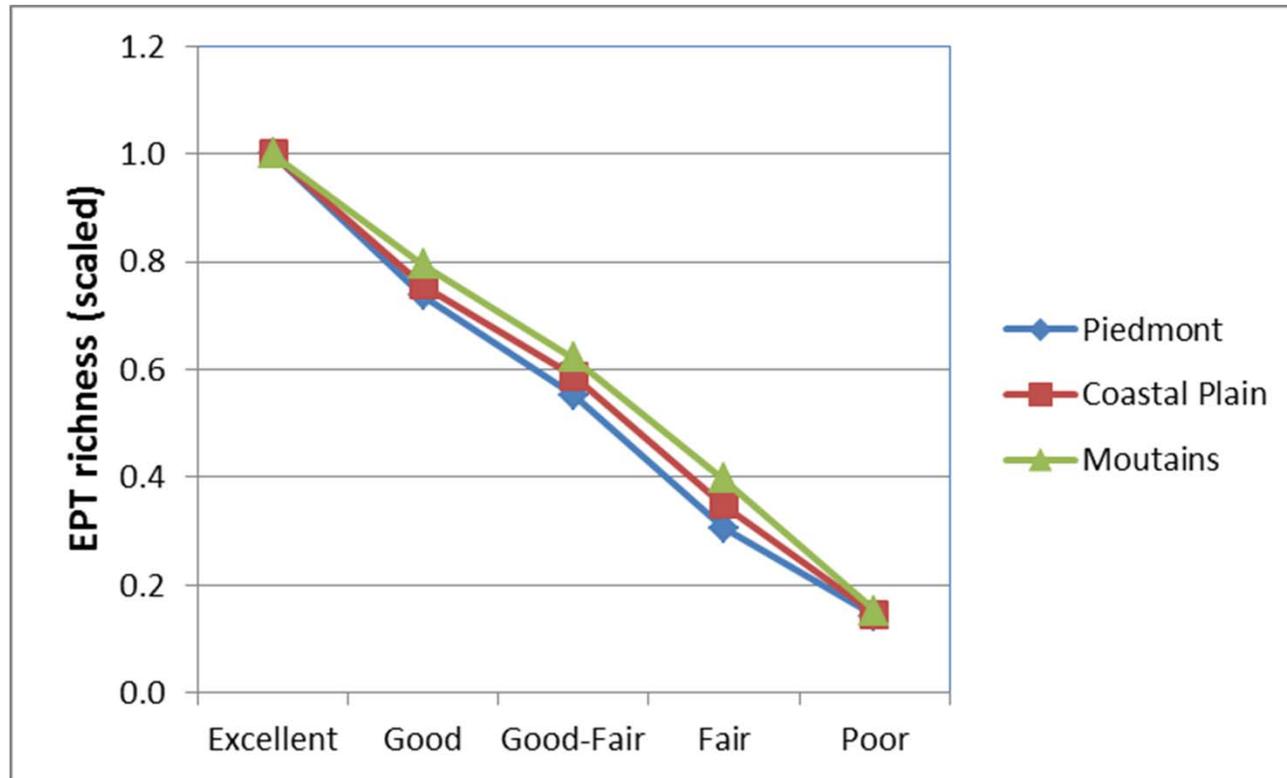
- DWQ has condition rankings for most sites and dates used in EF-SAB analyses

THEREFORE, WE CAN CALCULATE 90TH PERCENTILE FOR CONDITION CLASSES IN EACH ECOREGION



Mountains: 66 (Blue Ridge), Piedmont: 45, Coastal Plain: 63 (Mid Atlantic Coastal Plain) + 65 (Southern Plain)

STANDARDIZE FOR 90TH PERCENTILE CONDITION IN EACH CONDITION CLASS WITHIN EACH ECOREGION



DERIVE STATE-WIDE CONDITION CLASSES BASED ON AVERAGE STANDARDIZED VALUES



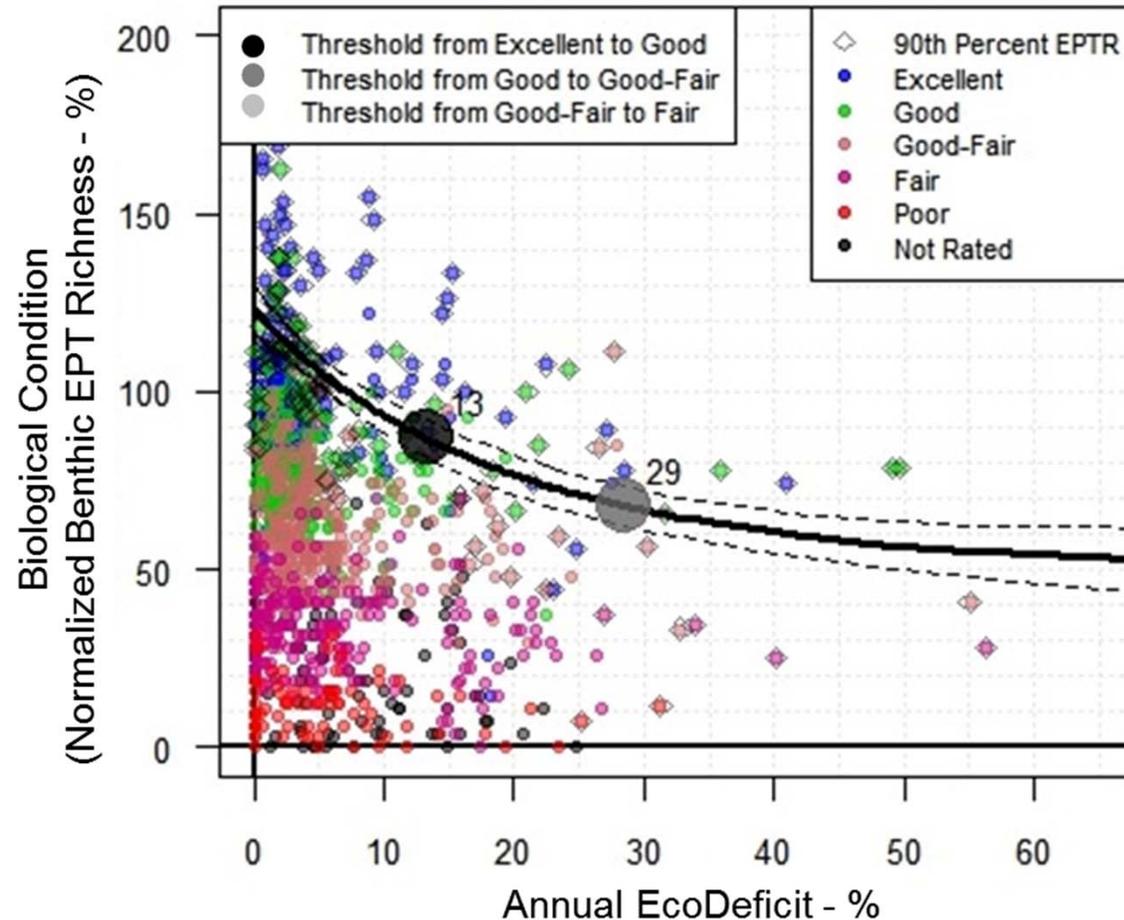
STATE-WIDE CONDITION CLASSES BASED ON 90TH PERCENTILE

	EPT richness ¹
Excellent	≥ 0.868
Good	0.868 - 0.675
Good-Fair	0.675 - 0.469
Fair	0.469 - 0.249
Poor	< 0.249

¹EPT taxa richness scaled by 90th percentile in mountains, Piedmont, and Coastal Plain

Screening criteria: if a planned water withdrawal results in a flow deficit (annual, summer, winter, etc.) that pushes the site into a lower condition class then a site-specific flow-ecology study is warranted (e.g., PHABSim).

STATE-WIDE CONDITION CLASSES BASED ON 90TH PERCENTILE



Note: Thresholds for Good-Fair to Fair and Fair to Poor are not reached within 100% decrease in Annual EcoDeficit

ADVANTAGES OF APPROACH

- Data-driven approach for establishing ecological flows
- Relates back to NC DWQ concept of biological condition classes
- Uses state-wide flow-biology relationships for fish and benthos (based on RTI flow-biology methodology) to support determination of ecological flows
- Guards against further degradation, while taking into account of current conditions
- On-going process (adaptive management)