



Oregon Water Quality Index (OWQI)

Oregon Roundtable on Sustainable Forests: May 12, 2010

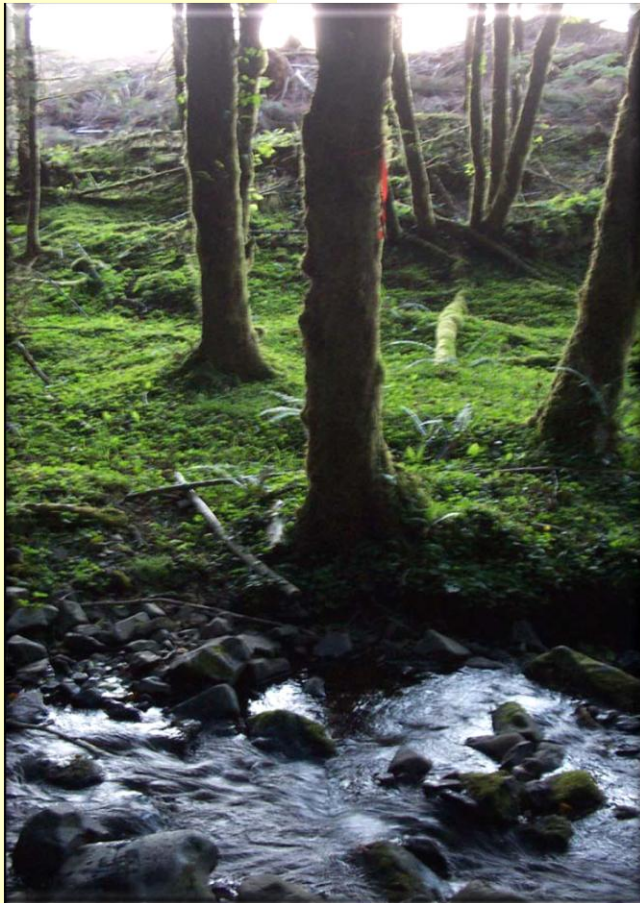


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Who created the OWQI?



- David A. Dunnette 1979
- Modified by Curtis Cude in February 2001 (EPH)



Why was the OWQI created?

- The index was developed to create a simple and concise method of evaluating the water quality of Oregon's streams.





How were the indicators selected?

- Delphi method.
- Impairment Categories
 - Oxygen depletion
 - Eutrophication or excessive biological growth
 - Physical characteristics
 - Dissolved substances
 - Health hazards





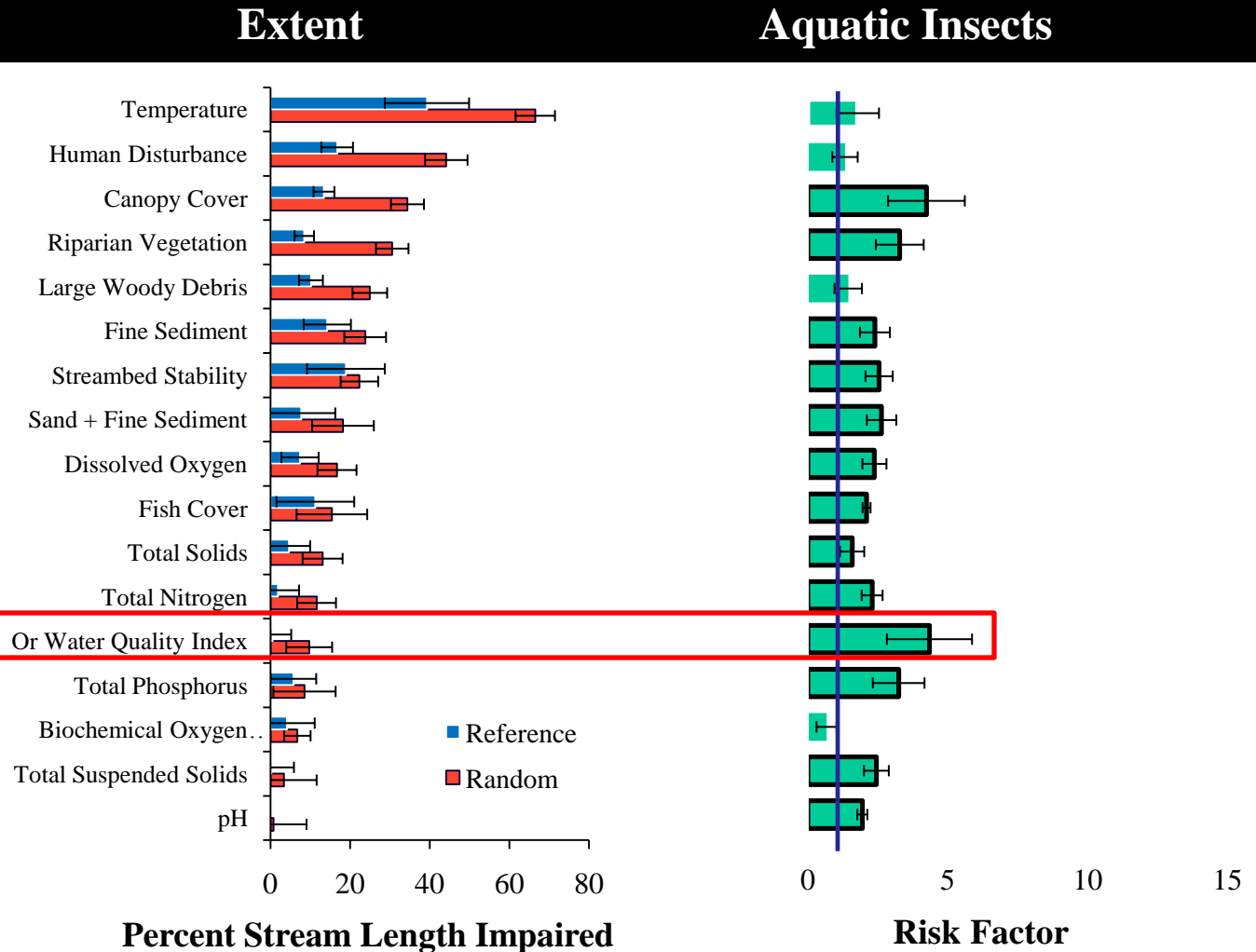
What water quality parameters make up the OWQI?

- The index combines eight water quality variables into a single number:
 - Temperature
 - Dissolved oxygen (DO)
 - Biochemical oxygen demand (BOD)
 - pH
 - Ammonia + nitrate nitrogen
 - Total phosphorus (TP)
 - Total solids (TS)
 - Bacteria (*E.coli*) formerly fecal coliform





Example of the relationship between OWQI and beneficial use





Is the OWQI useful for detecting trends in water quality?

- Yes if a **sufficient number of samples** are collected over time this is the strength of the index.
- Determines the direction and significance of any trend for each season over test period.
- Individual parameters can be assessed for trends as well.





Is the OWQI appropriate for describing water quality on forest lands?

- The index was originally designed for use at ambient monitoring sites.
 - Integrator sites which convey multiple land use stressors.
- Other parameters such as herbicides, pesticides and sediment are not captured by the index.
- Sensitive beneficial uses such as drinking water are not addressed in the OWQI.





How are categories assigned?

- A distribution of minimum seasonal average scores was calculated at 136 ambient monitoring sites and adjusted.
 - <60 is “very poor”
 - 60-79 is “poor”
 - 80-84 “fair”
 - 85-89 “good”
 - 90-100 “excellent”





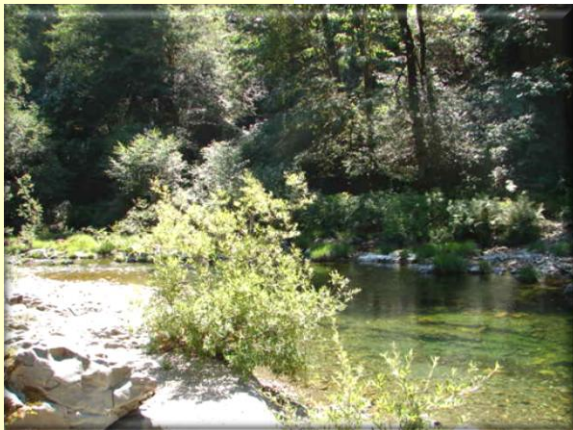
Can improvements be made in assessing water quality on forest lands?

- Use reference sites to generate benchmarks values tailored to smaller streams.
- Incorporate pesticides and herbicides data on forest lands.
- Include an additional sediment indicator such as turbidity.



Conclusions

- The index is a valuable tool for assessing general water quality and trends.
- It does relate to Clean Water Act objective of swimmable and fishable.
- With some adjustments, this index could be made more sensitive to water quality conditions on forest lands.
- It does not address toxic chemicals on forest lands.





Thank you

- Thanks to Curtis Cude for developing the OWQI.
- For more information, visit the DEQ website at:

<http://www.deq.state.or.us/lab/techrpts/docs/DEQ05LAB0036TR.pdf>

- Questions?



Statewide

- Water quality is predominantly in excellent condition
 - 77% Excellent
 - 5% Poor/Very Poor
- Biological condition is generally good
 - 53% Least disturbed
 - 24% Most disturbed



Ownership--Statewide

Ownership class (n)	OWQI (% Excellent)	PREDATOR (% Least disturbed)
Federal (623)	86	55
State (69)	75	51
Private Industrial (171)	66	58
Private Non- industrial (80)	59	35