

US EPA ARCHIVE DOCUMENT

# Biological criteria for cold water streams based on a survey of the Oregon and Washington Coast Range

R. M. Hughes, Dynamac Corp.,  
200 SW 35th St., Corvallis, OR

S. Howlin, West Inc.,  
2003 Central Ave., Cheyenne, WY

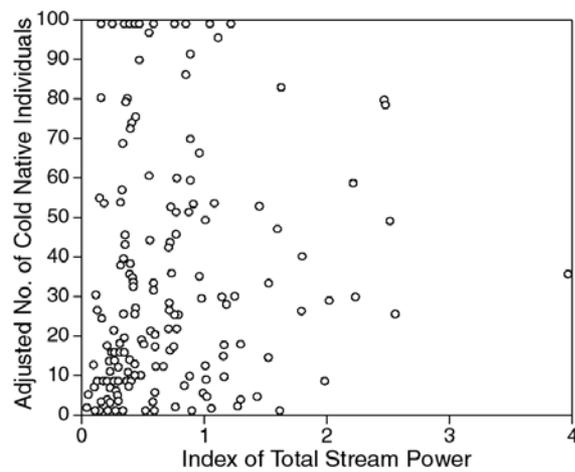
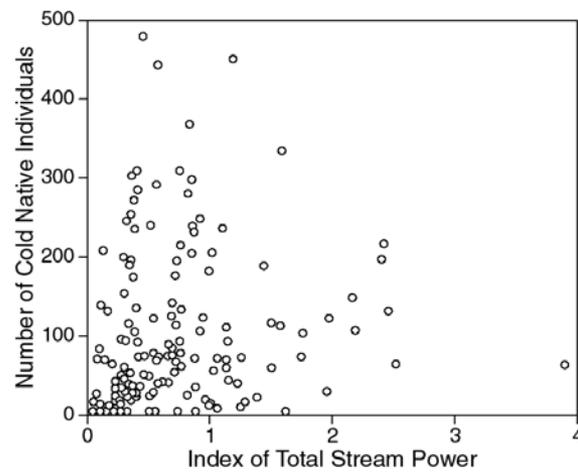
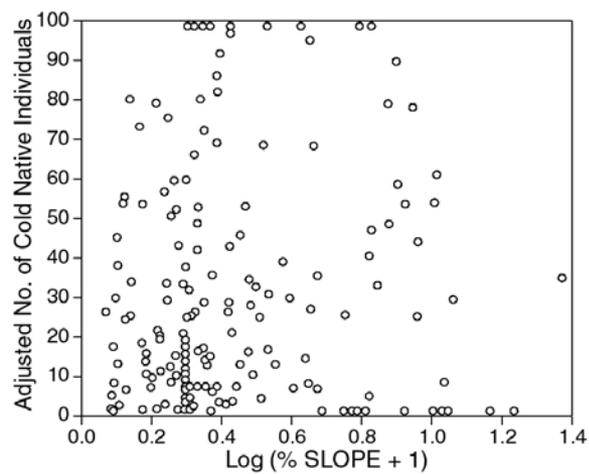
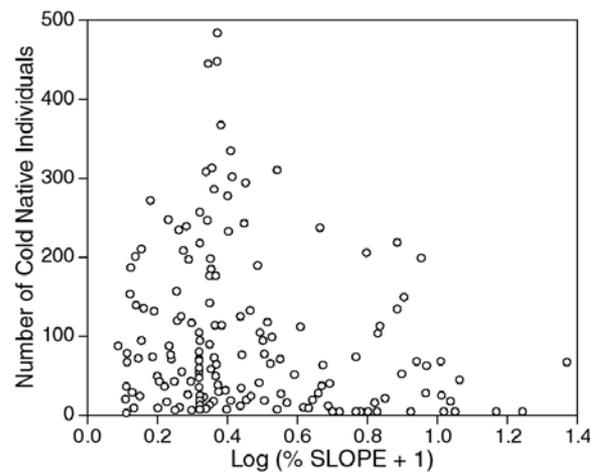
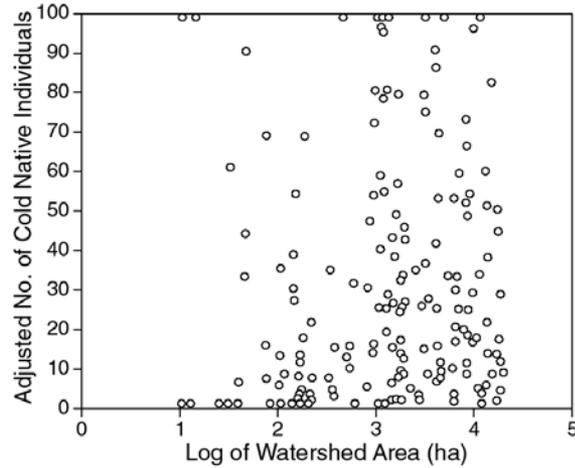
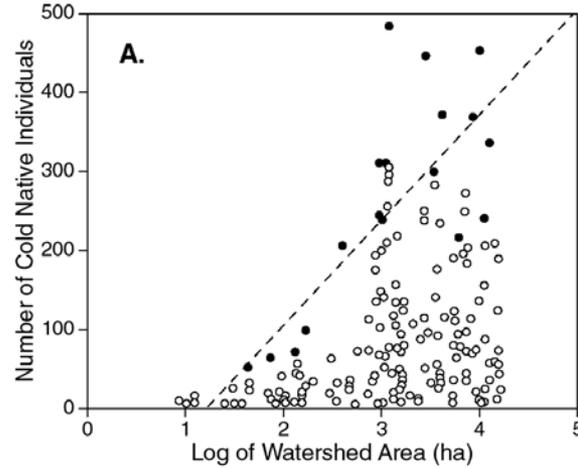
P. R. Kaufmann, USEPA,  
200 SW 35th St., Corvallis, OR

# Objective

- Develop and apply a biological criterion, based on aquatic vertebrate assemblages, for Coast Range OR & WA streams

# Methods

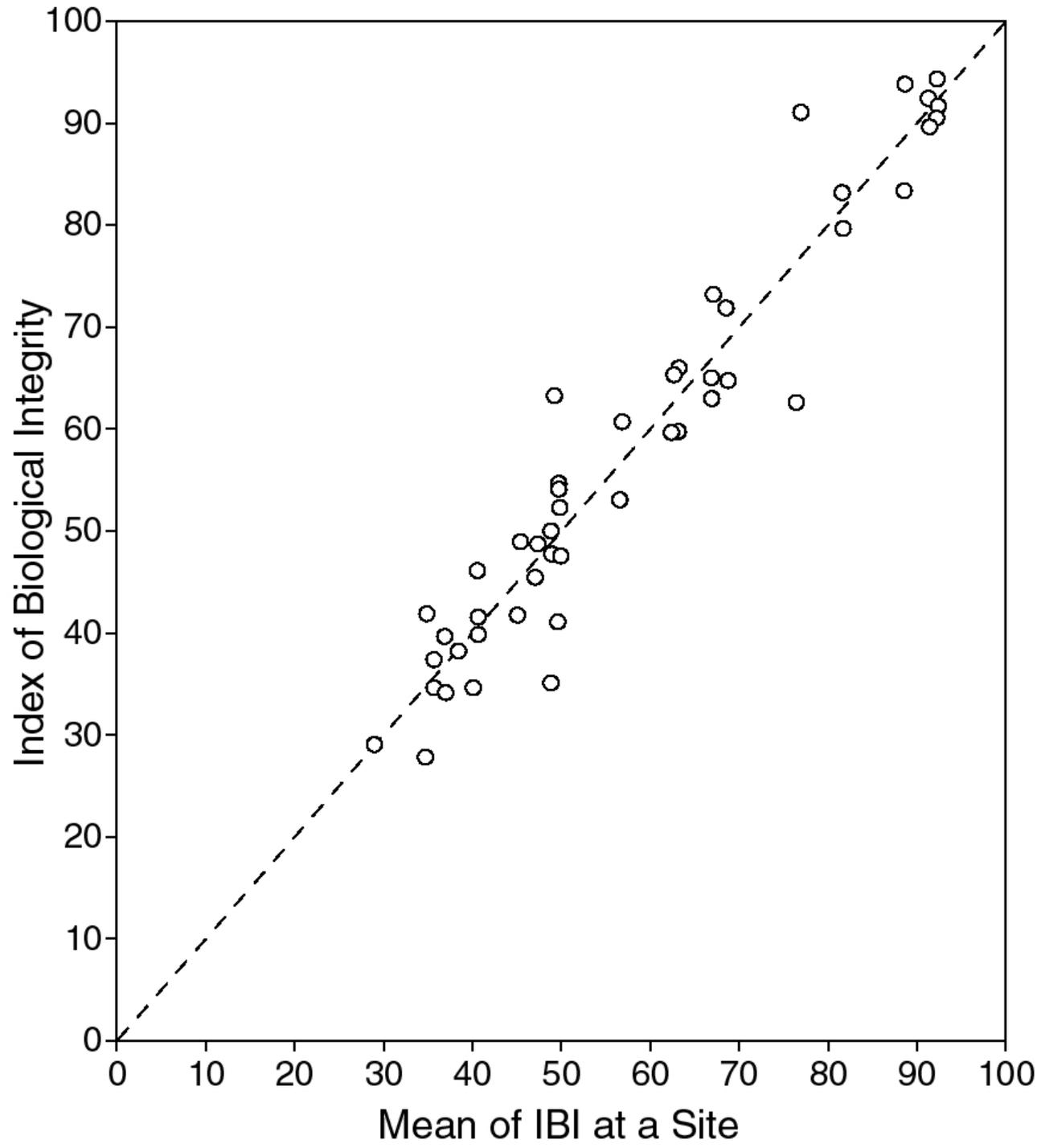
- Screen stressors correlated with natural gradients
- Adjust metrics for catchment area
- Select metrics responsive to varied stressors
- Select metrics with low among-site/index period variance
- Use minimally disturbed reference sites to set IBI impairment thresholds



# Fish IBI Metrics

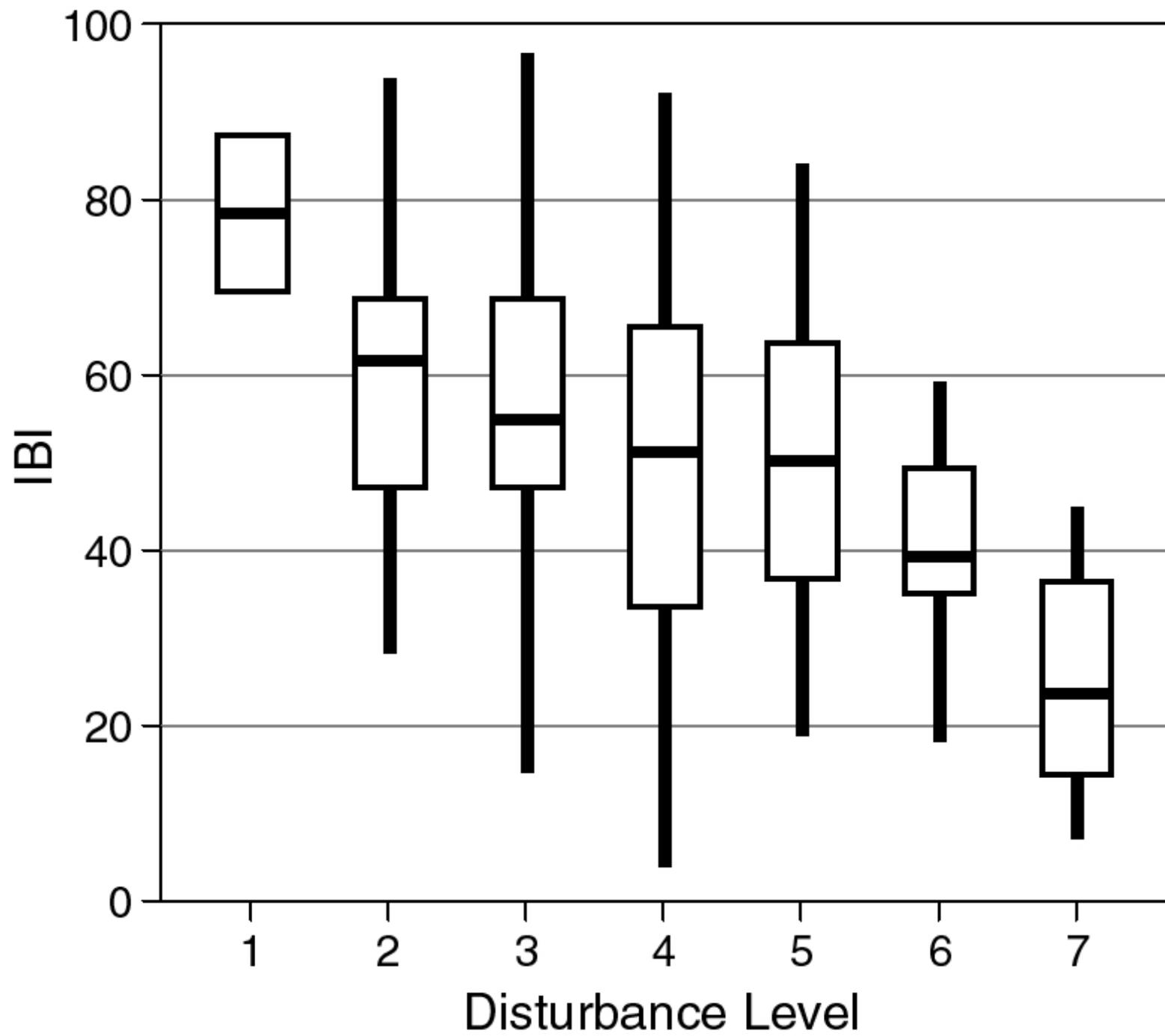
- % Alien species
- % Coolwater species
- % Anadromous species
- % Coldwater species
- No. tolerant individuals
- No. native coldwater species
- No. native coldwater individuals
- No. size classes

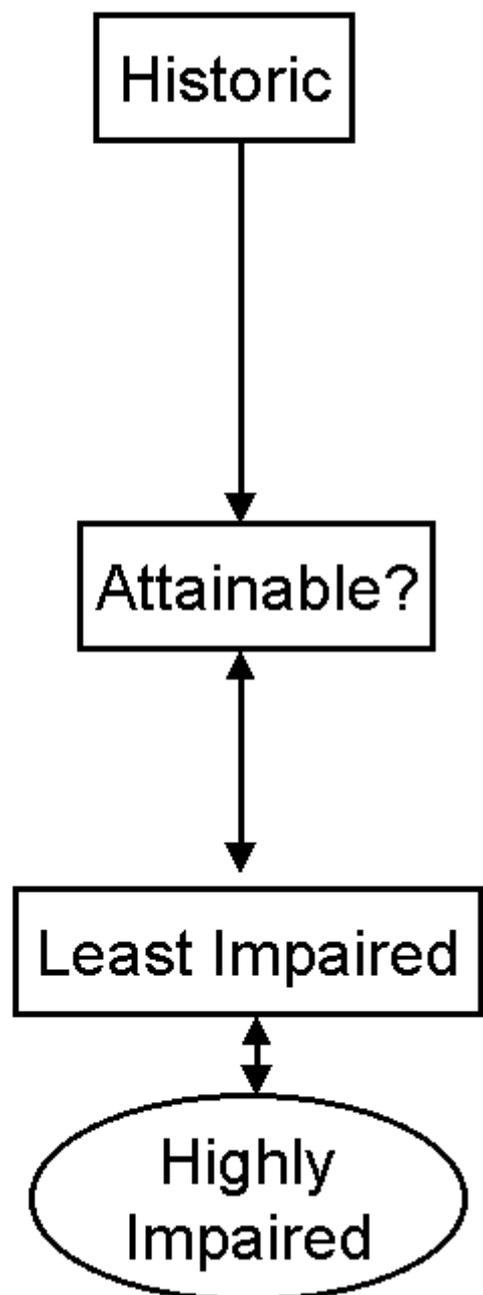
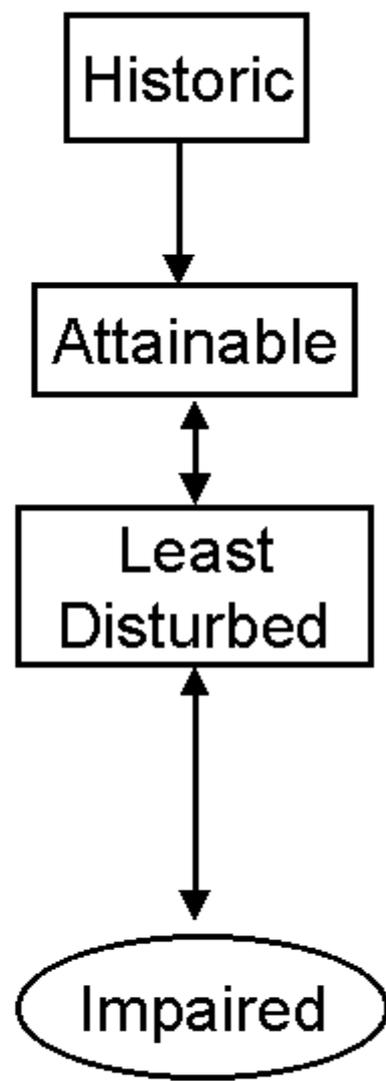
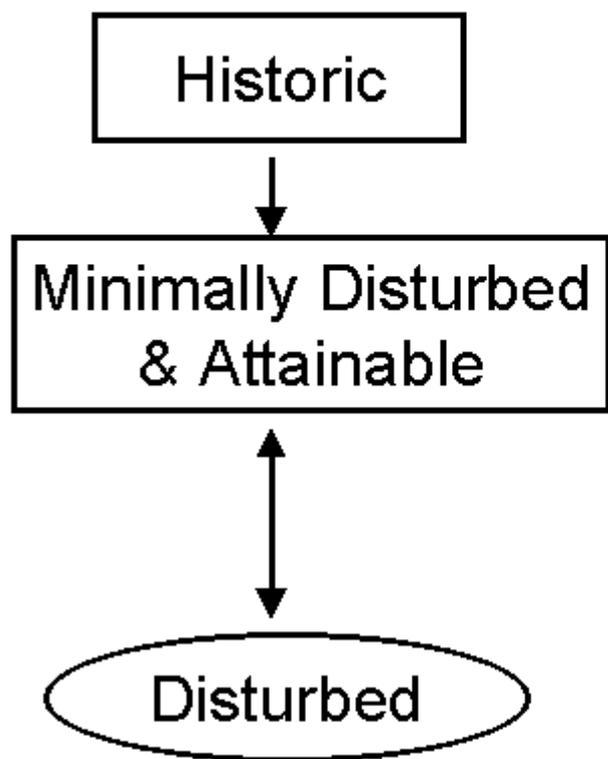




# Significant IBI Correlations with Stressors

- Residual pools 0.21
- % Sand & fines -0.64
- Bed stability 0.58
- Log total N -0.34
- Log total P -0.47
- Riparian human disturbance -0.39
- Catchment road density -0.35

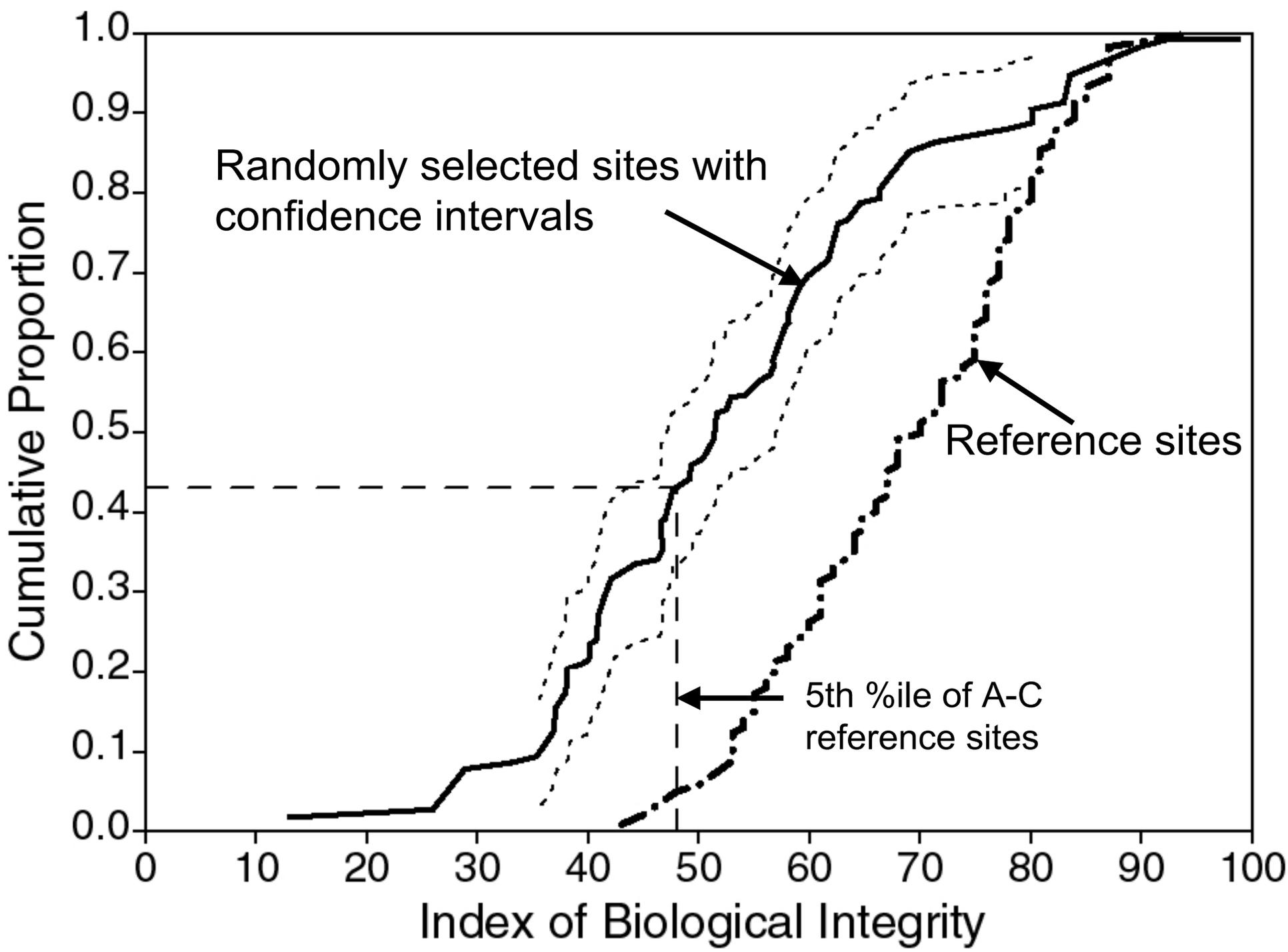


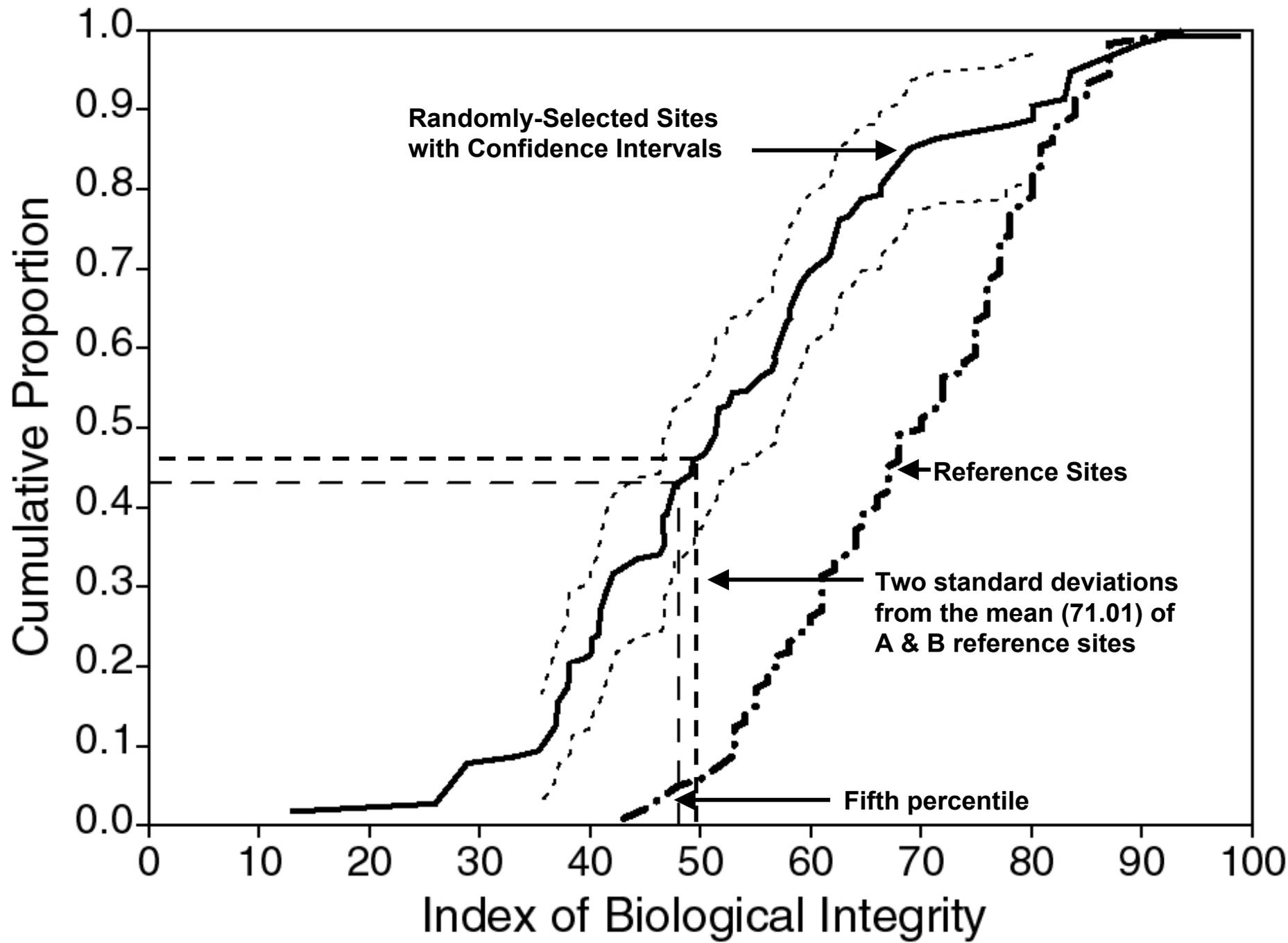


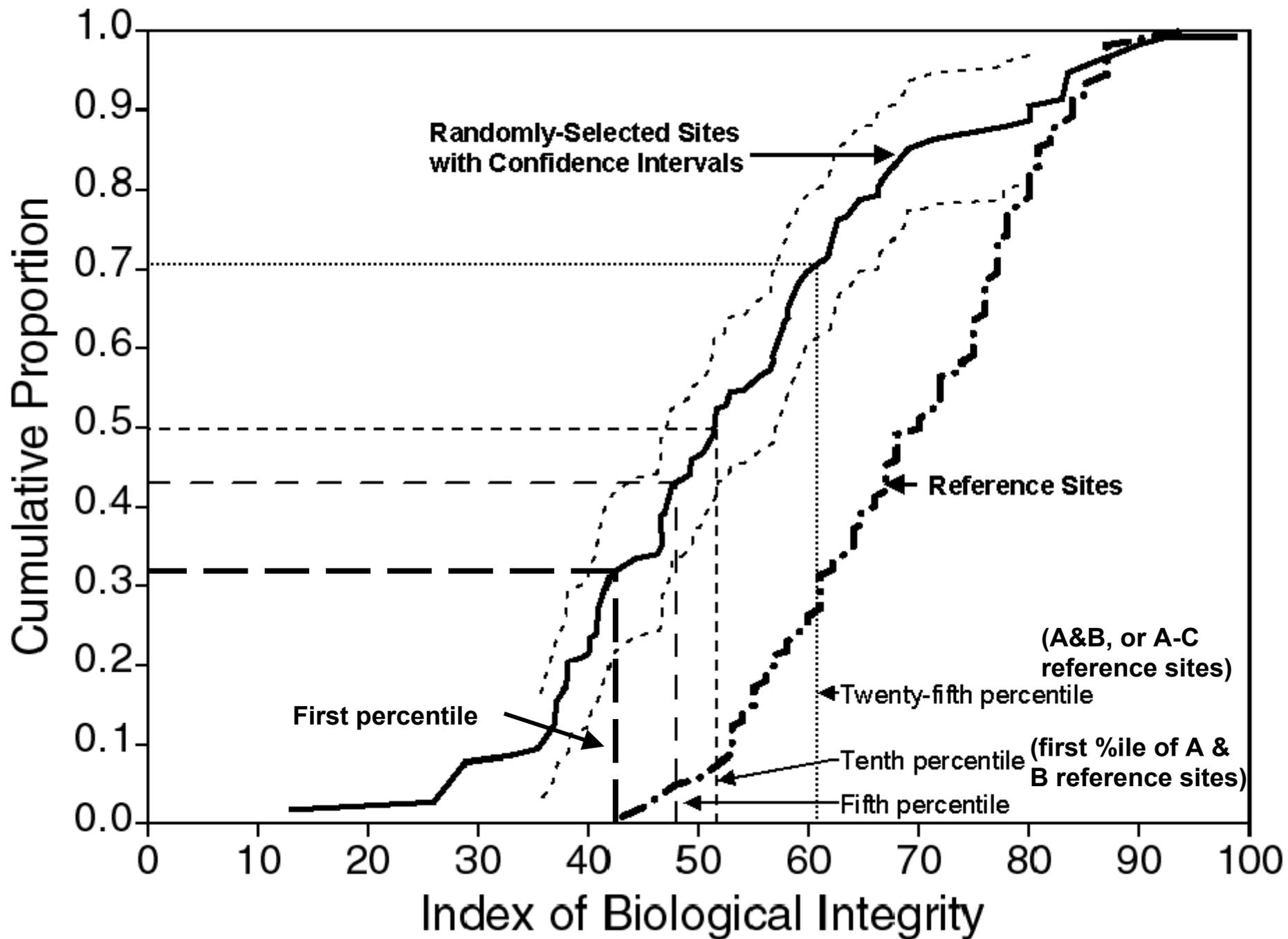


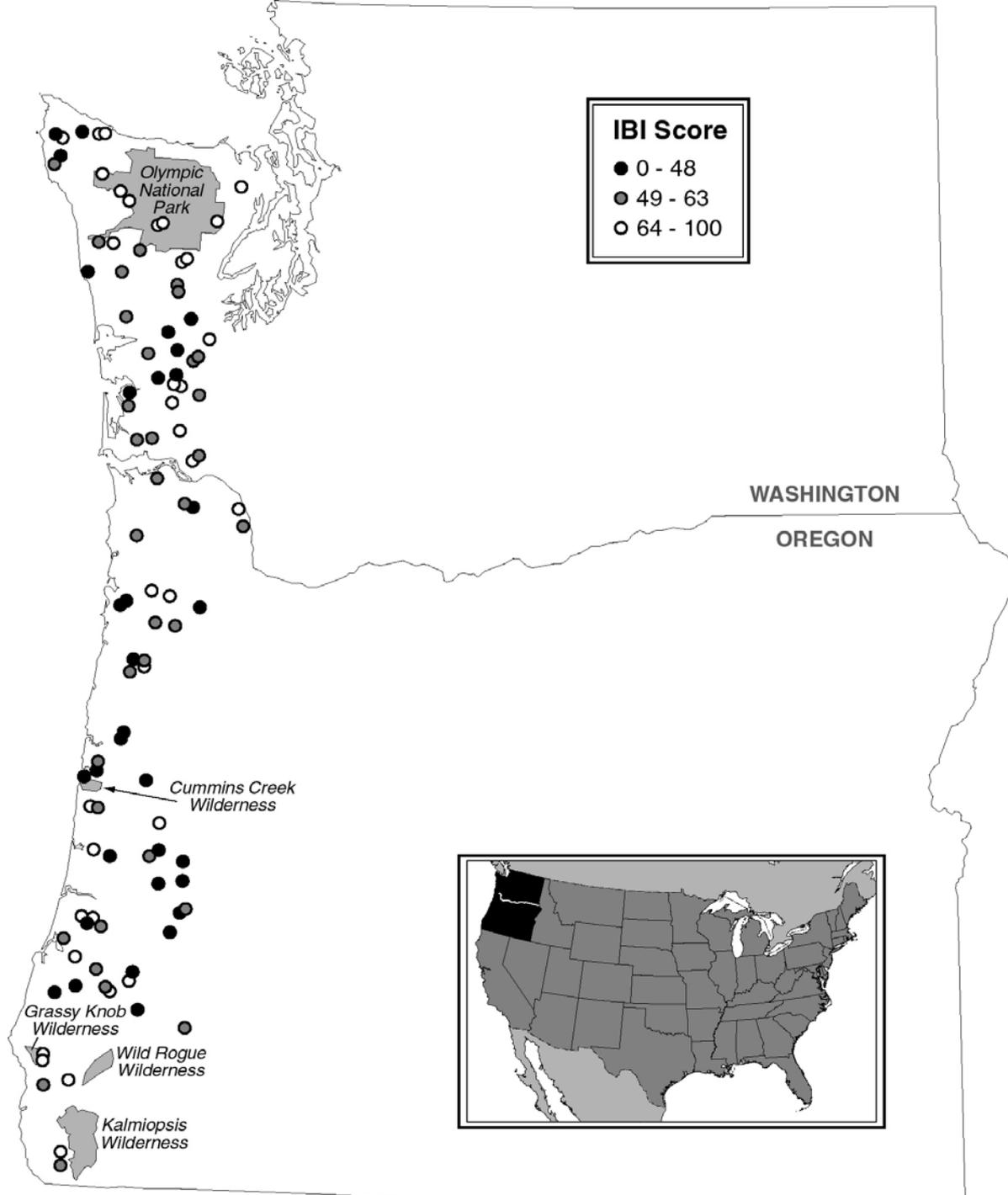


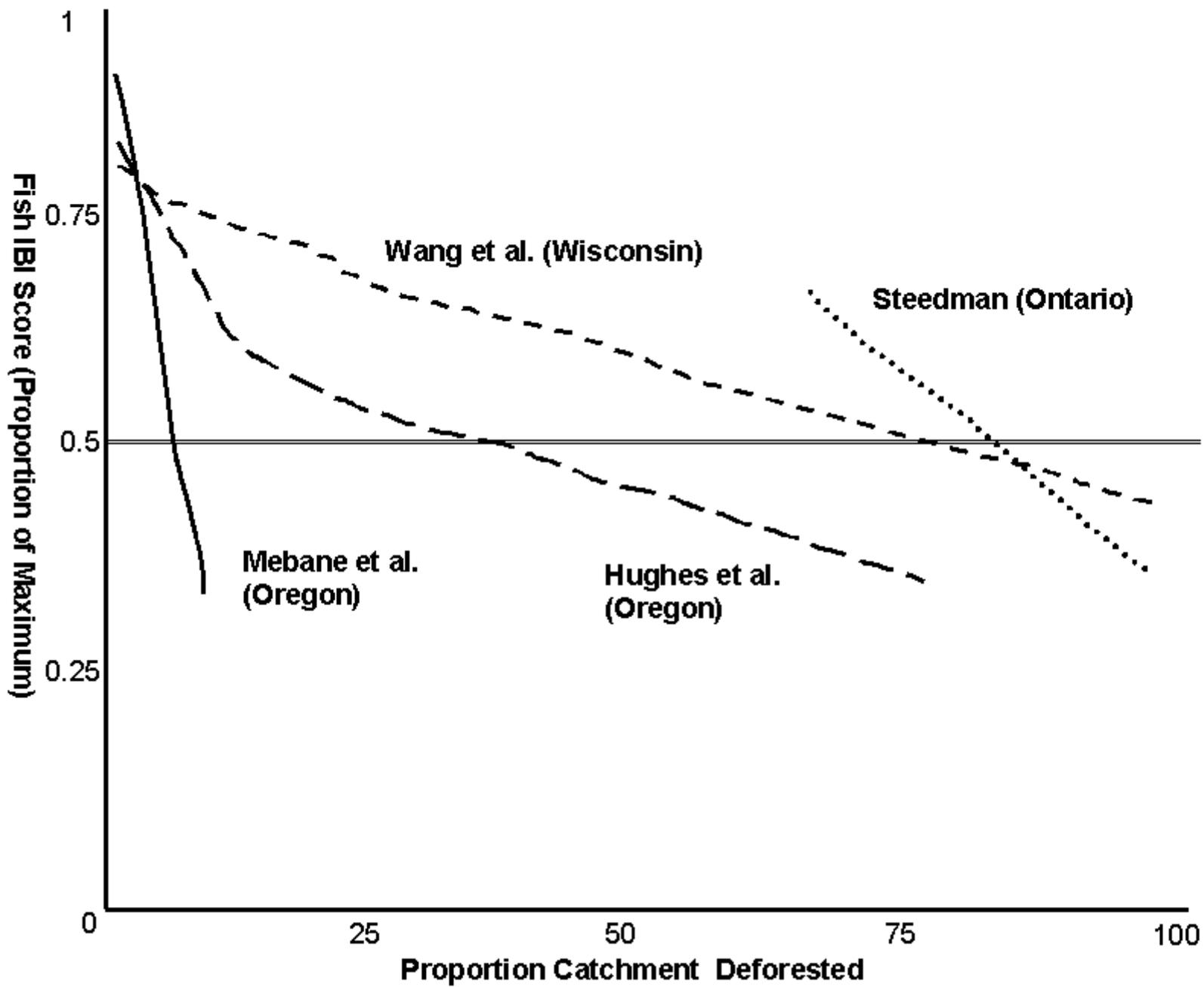












# Conclusions

- IBI precise (signal/noise of 4.7)
- IBI correlated significantly with several stressors
- 43-46 % (10,173-10,883 km) of streams impaired if 5th %ile or 2SD from mean of reference sites used as biocriterion