BRIDGES

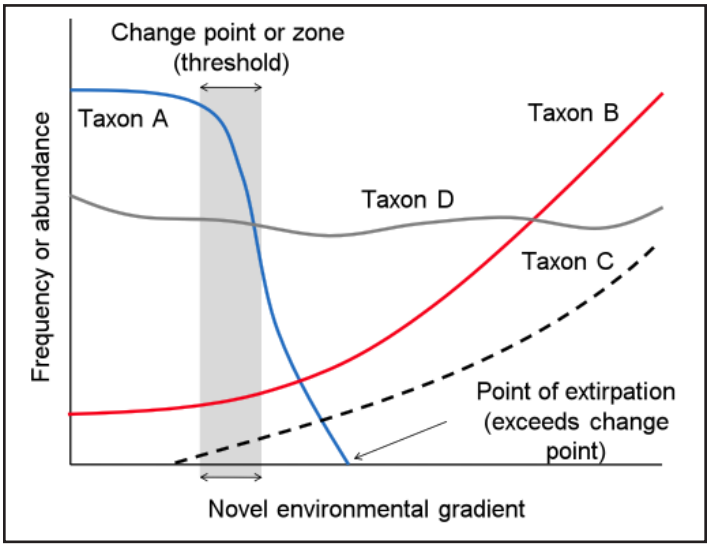
Journal of the North American Benthological Society

Volume 29 • Issue 3 • Pages 988-1023
September 2010 Fact Sheet

Evidence of Thresholds in Freshwater Ecosystems and Implications for Managers

Four papers in this BRIDGES cluster use case studies to provide evidence of degradation and recovery thresholds in freshwater ecosystems. Key points include:

- Initial biotic degradation may occur at very low levels of disturbance, with an additional threshold for complete extirpation (Hilderbrand et al. 2010, King and Baker 2010)
- Thresholds may be best detected using individual taxa (vs aggregate community metrics; King and Baker 2010) and long-term datasets (to detect natural fluctuations; Clements et al. 2010)
- Methods used in this cluster to identify thresholds include: Threshold Indicator Taxa Analysis (TITAN; King and Baker 2010), cumulative frequency distribution (Hilderbrand et al. 2010), Significant Zero crossings (SiZer; Clements et al. 2010), break point regression, quantile regression, and nonparametric changepoint analysis (Dodds et al. 2010)
- Understanding mechanisms underlying ecosystem responses (Dodds et al. 2010) can aid in predicting future biodiversity losses (Hilderbrand et al. 2010) and identifying appropriate remediation targets (Clements et al. 2010)
- Given the potential negative consequences of ecosystem degradation and difficulty in recovery, management resources are best used to prevent initially crossing degradation thresholds into an altered ecosystem state



Theoretical response of different taxa to novel environmental gradients (Fig. 8 from King & Baker 2010).

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