

Lake Erie System Model: A Fuzzy Cognitive Map to Support Development of Ecosystem Objectives.

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Agencies and concerned citizens are developing ecosystem objectives for the Lake Erie Management Plan (LaMP) as directed by the GLWQA.. The level of change in the Lake Erie ecosystem precludes adoption of objectives based on return towards pristine conditions, and conflicts exist between and among stakeholder interests and agency policies. A model of ecosystem components, values, impacts and remediation measures was developed in order to explore possible system configurations. The model structure is a fuzzy cognitive map in which physical processes are typically represented as linear (phosphorus loading), while biotic responses are represented logistically as niche (Hutchinsonian-Fry) response surfaces. The model essentially provides a flexible book-keeping function for a range of knowledge from general knowledge to peer reviewed science. All relationships are documented and can be audited. The model can be exercised by varying initial conditions and controllers, which represent human effects (e.g., land use, exploitation), in order to produce scenarios of the future. Organization of these scenarios by cluster analysis identifies potential ecosystem states. Ecosystem Objectives will be written as a characterization of a single state, selected with public consultation. This is a progress report on behalf of the EOSC sub-committees of the LaMP Workgroup and Public Forum.