Abstract Title:
A systems biology approach to understanding impacts of environmental contaminants on fish reproduction.

Presenter:
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Abstract:
Over the past decade, our research team at the US EPA Mid-Continent Ecology Division has employed systems biology approaches to examine and understand impacts of environmental contaminants on fish reproduction. Our systems biology approach is one in which iterations of model construction, empirical testing of model-derived hypotheses and model revision are employed to develop mechanistic understanding of the response of a biological system to perturbation and to use that understanding to predict outcomes. The objectives of the work are to (1) define adverse outcome pathways relevant to fish reproduction, (2) evaluate the utility of 'omics' and molecular screening data for ecological risk assessment applications, (3) support development of virtual endocrine system models and other extrapolation tools, and (4) apply adverse outcome pathway knowledge to support integrated effects-based monitoring in the field. This presentation demonstrates the approach and application using representative results from previous studies. It also details on-going research being conducted in support of EPA's Chemical Safety for Sustainability (CSS) research program.