

## Ecosystem Services in Risk Assessment and Management

Wayne R. Munns, Jr.<sup>1</sup>, Veronique Poulsen<sup>2</sup>, William Gala<sup>3</sup>, Stuart J. Marshall<sup>4</sup>, Anne W. Rea<sup>1</sup>, Mary Sorensen<sup>5</sup>, Katherine von Stackelberg<sup>6</sup>

<sup>1</sup>US Environmental Protection Agency; <sup>2</sup> French Agency for Food, Environmental and Occupational Health & Safety; <sup>3</sup>Chevron Energy Technology Co.; <sup>4</sup>Unilever Colworth; <sup>5</sup>ENVIRON International Corp.; <sup>6</sup>NEK Associates LTD

The ecosystem services concept provides a comprehensive framework for considering ecosystems in decision making, for valuing the services they provide, and for ensuring that society can maintain a healthy and resilient natural environment now and for future generations. A global Pellston Workshop was convened by SETAC and the Ecological Society of America (ESA) in Shepherdstown, WV, USA, in September 2014 to develop broad consensus and practical guidance for the application of the ecosystem services concept to environmental decision making as part of a movement towards environmental sustainability. This presentation will highlight opportunities and implications of including ecosystem service endpoints in risk assessments and the decisions that risk assessment informs. We describe five assertions about the benefits that will accrue from application of the ecosystem service concept in risk assessment and risk management, stating that the use of ecological services will lead to more comprehensive and transparent environmental protection, help articulate the net benefits of environmental decisions/policies/actions, better inform the derivation of environmental quality standards and specific protection goals, and enable the bridging of human health and ecological risk assessment across multiple regulations and programs. We also describe recommendations that emerge from these assertions and the issues, challenges, and path forward associated with employing ecosystem services in risk assessment and decision making.