Science and Technology for Sustainability Program:

Summary of Progress and Future Direction

SAB Discussion, August 16, 2010

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Sustainability Research

"The focus on sustainability research recognizes the changing nature of environmental challenges that society faces today. In the past EPA focused its actions more directly on specific pollutants, their sources, and causes. More recently, and into the future, the Agency must provide information to help address a broader set of environmental issues involving population and economic growth, energy use, agriculture, and industrial development. Capably addressing these questions, and the tradeoffs they will entail, requires the new systems-based focus on science and analysis offered in the Sustainability research Strategy."

–*Sustainability Research Strategy*, October 2007

United States Environmental Protection Agency

SAB Calls for Appropriate Workforce and New Management Structure

"Although the science in the Plan is sound, it is unlikely that the Agency's sustainability outcomes will be achieved within five years. Success in that time frame requires greater resources, both human and financial. Obviously, a workforce with experience and expertise relating to sustainability is necessary. *A management structure aligned with a systems-based approach to environmental decision-making is also vital" (italics added).*

– SAB Letter to EPA Administrator June 2007

(These recommendations are being addressed in the Path Forward, 2010)

SAB Recommends Focus on National Problems

"The Committee feels that the careful selection of multifaceted research projects within the [STS Multi-year] Plan is helpful to the adoption of the sustainability paradigm both within and outside the Agency. EPA has a prominent leadership mandate in the sustainability arena and its research projects and their products are important for adoption of the paradigm. *The projects should have visibility and be nationally compelling. The research* products should strategically integrate into the other 16 multi-year plans across the Agency and allow the Agency to guide other Federal agency research on sustainability" *(italics added).*

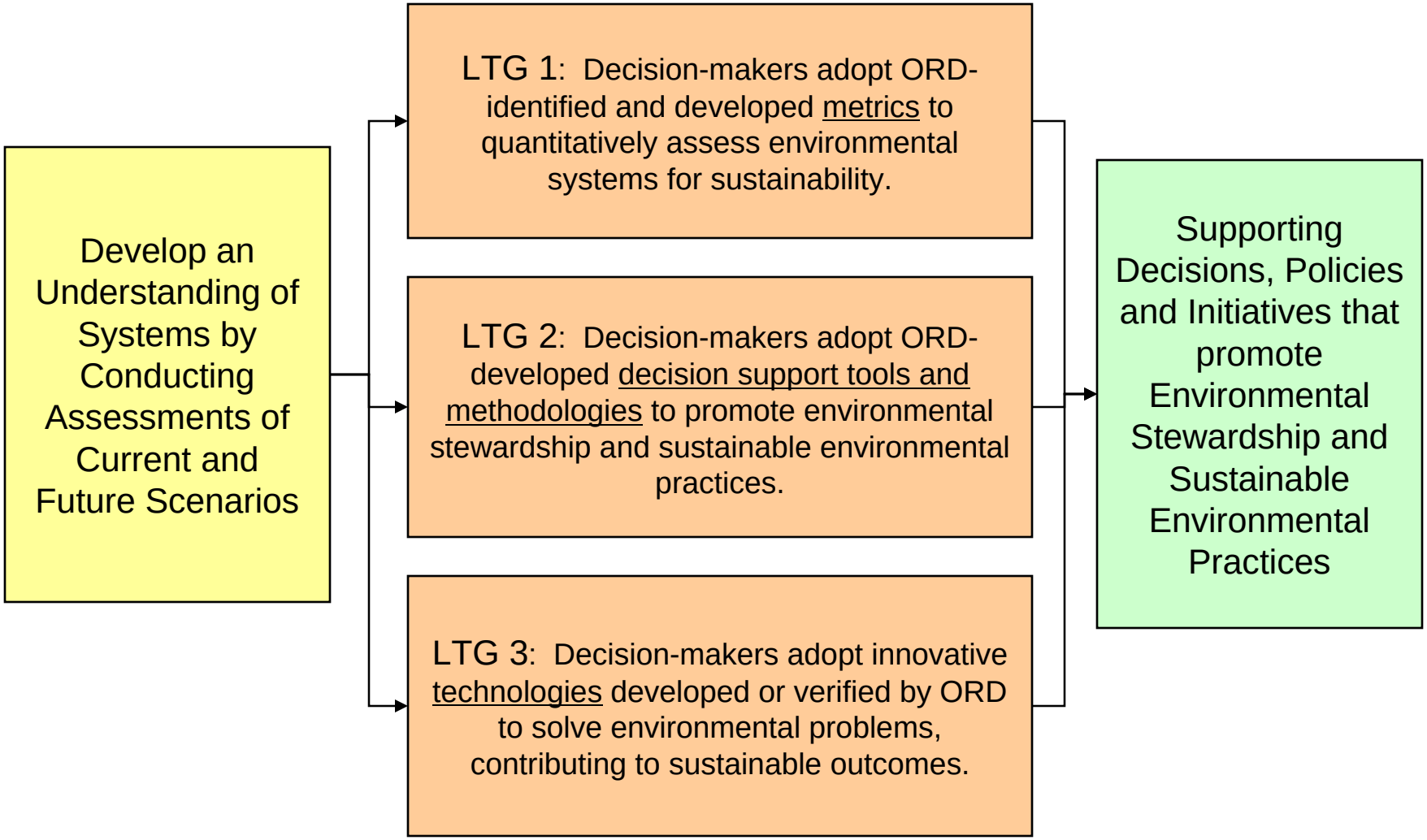
– SAB Letter to EPA Administrator June 2007

STS Phase 1, 2003–2005: Setting the Vision

First attempt to make Sustainability *an integrating concept* across ORD:

- Labs and Centers continued work on prevention technologies (e.g., green chemistry) and expanded efforts to develop decision support tools that can perform more holistic evaluations of technologies, processes, and systems.
- Used concept of *living laboratories* (regional and state projects) to transfer sustainability concepts to users
  - Launched Collaborative Science and Technology (CNS) program to achieve this goal
  - Funded dozens of CNS projects that connected diverse sets of partners including universities, federal agencies, and cities
- Organzied STS research to focus on three long-term goals (LTGs): metrics, decision support tools, and technology development (including P3, SBIR, and ETV)

STS Core Activities: Long-Term Goals



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STS Phase 2, 2005-2007: Develop Sustainability Research Strategy

- Transitioned Pollution Prevention and New Technologies Research Program into the Science and Technology for Sustainability Research Program
- *Attempted to leverage all ORD resources* by coordinating and integrating research across ORD, with minimum success
- Developed collaborations and partnerships with EPA program and regional offices, other federal agencies, state and local governments, communities, industry, nonprofit organizations, universities, and international partners, with minimum success

STS Phase 3, 2007-2010: Focusing on National Issues

- Responded to SAB and BOSC guidance to apply STS research activities and expertise to clearly defined national issues
  - Selected sustainable biofuels as initial emphasis
- Took a leadership role to coordinate EPA biofuels research activities
- Increased funding in FY 2010 budget for biofuels work by $5 million
- Beginning to assess other areas of national significance – i.e., What is the next integrated sustainability issue beyond biofuels? (See Path Forward)

STS Achievements in FY 2010

- Achieved a BOSC mid-cycle review rating of "Exceeds Expectation"
- Promoted national dialogue on EPA@40 and need for systems based sustainability science. See "EPA@40" (*ES&T* Viewpoint article)
- Held workshop with Program and Regional Offices to define biofuel research needs
- Launched new integrated and trans-disciplinary biofuel research program
- Completed *A Review of Life Cycle-Based Tools Used to Assess the Environmental Impacts of Biofuels in the United States*
- With Region 8, National Park Service, and other stakeholders, finished first phase of San Luis Basin metric study and presented results of metrics project to county and state officials and Park Service
- Launched new sustainability and metrics project in Puerto Rico

STS Achievements in FY 2010

- Completed web-accessible version of LCA-based tool (MSW-DST) to evaluate the cost and life cycle environmental tradeoffs of municipal solid waste (MSW) management strategies
- Co-hosted workshop on international LCA data needs
- Responding to Administrator's priorities, created working- level network of sustainability coordinators in Regions and Programs
- Awarded 43 P3 grants for 6th annual sustainability expo
- Implement NRMRL-CRADA with Procter & Gamble to collaborate on design of sustainable supply chains for consumer products
- Coordinated and helping prepare (with NCEA-lead) congressional mandated Biofuel Report to Congress (see next slide)

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First Report Due December 2010

EPA Report to Congress

Not later than 3 years after the enactment of this section and **every 3 years thereafter**, the Administrator of the Environmental Protection Agency, in consultation with the Secretary of Agriculture and the Secretary of Energy, shall assess and report to Congress on the impacts to date and likely future impacts of the requirements of section 211(o) of the Clean Air Act on the following:

(1) *Environmental issues*, including air quality, effects on hypoxia, pesticides, sediment, nutrient and pathogen levels in waters, acreage and function of waters, and soil environmental quality.

(2) *Resource conservation issues*, including soil conservation, water availability, and ecosystem health and biodiversity, including impacts on forests, grasslands, and wetlands.

(3) *The growth and use of cultivated invasive or noxious plants* and their impacts on the environment and agriculture.

Phase 4, 2011-2012
The New Path Forward

- ORD AA Paul Anastas makes sustainability ORD's "true north."
  - Management working group ("Delta Group" of L/C Directors) tasked to develop plans to make sustainability operational across all of ORD
  - Delta Group (detailed for June and July) to develop recommendations to coincide with FY 2012 budget planning process; transition group will follow.
  - STS organized ORD sustainability training STS program
- Need to better communicate availability and use of decision support tools
- Future direction of LTG 3 related to Administrator's focus on innovation and technology. May impact ETV and other STS programs

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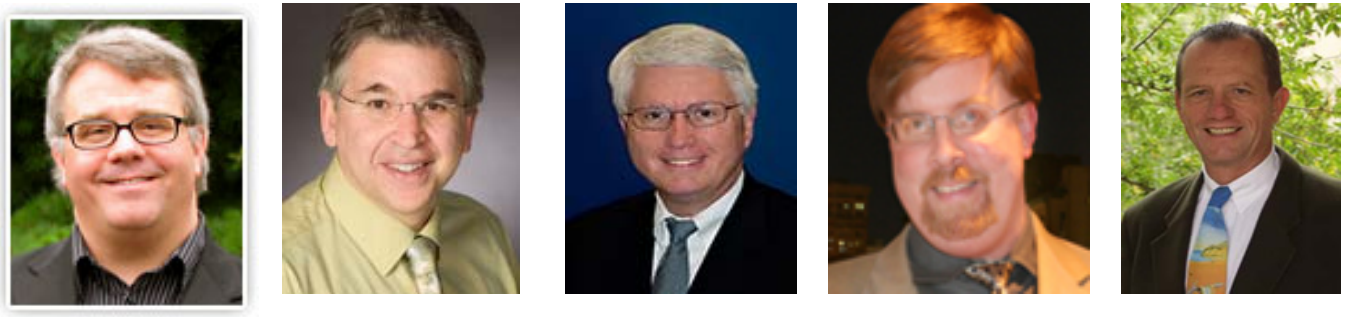
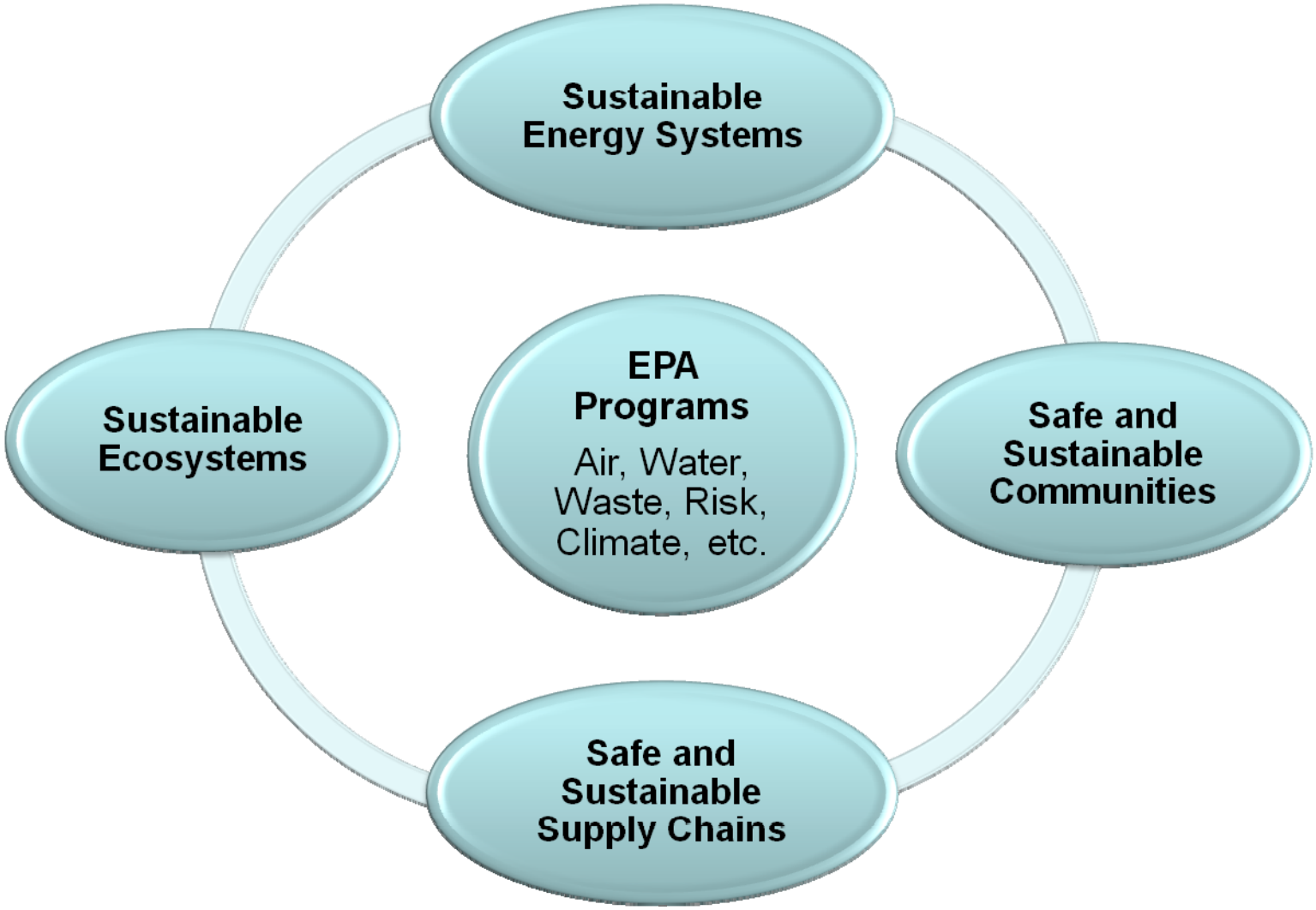
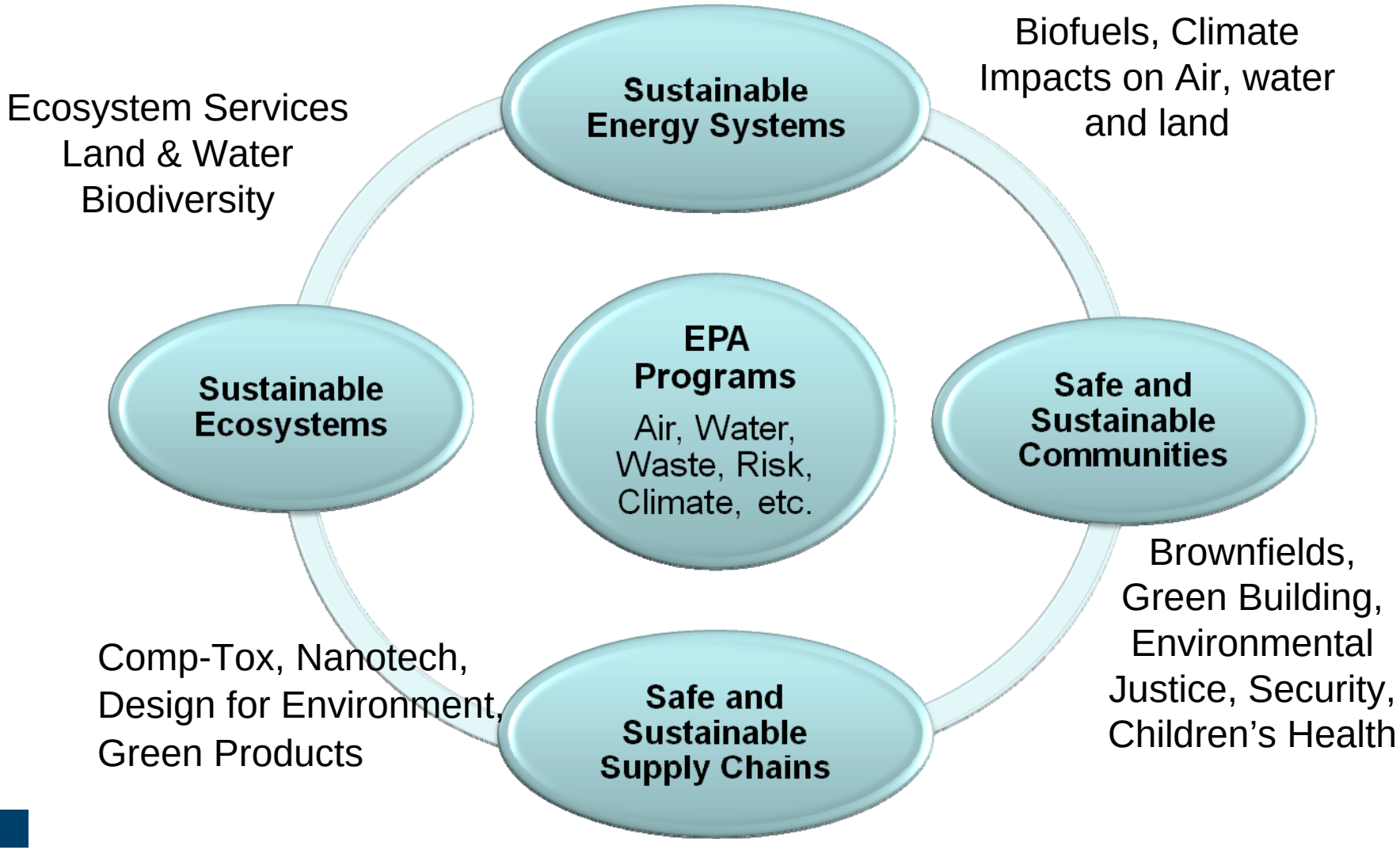
ORD Sustainability Training



Sustainability Themes



Managing Sustainability Themes and ORD-EPA Linkages



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***SAB Recommendation*: ORD needs to explicitly promote and integrate a life-cycle approach to environmental protection decision-making within the Strategy that goes beyond simply generating information and furnishing it to decision makers.** –SAB Letter to Administrator June 2007

Evolution of ORD Sustainability Program

Current Efforts

- Research to support development of EPA regulations and policies
- Leading EPA on risk management research and assessment

Additional Future Efforts

- Anticipating and responding to emerging issues
- Promoting multidisciplinary and systems research
- Advancing innovation, and sustainable practices and solutions

Looking Ahead ORD Transformation And Sustainability Research 2012