EPA
United States
Environmental Protection
Agency

Emerging Technologies and Vulnerable Populations

NACEPT Meeting

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January 20, 2011

Context for Science and Technology in Support of EJ

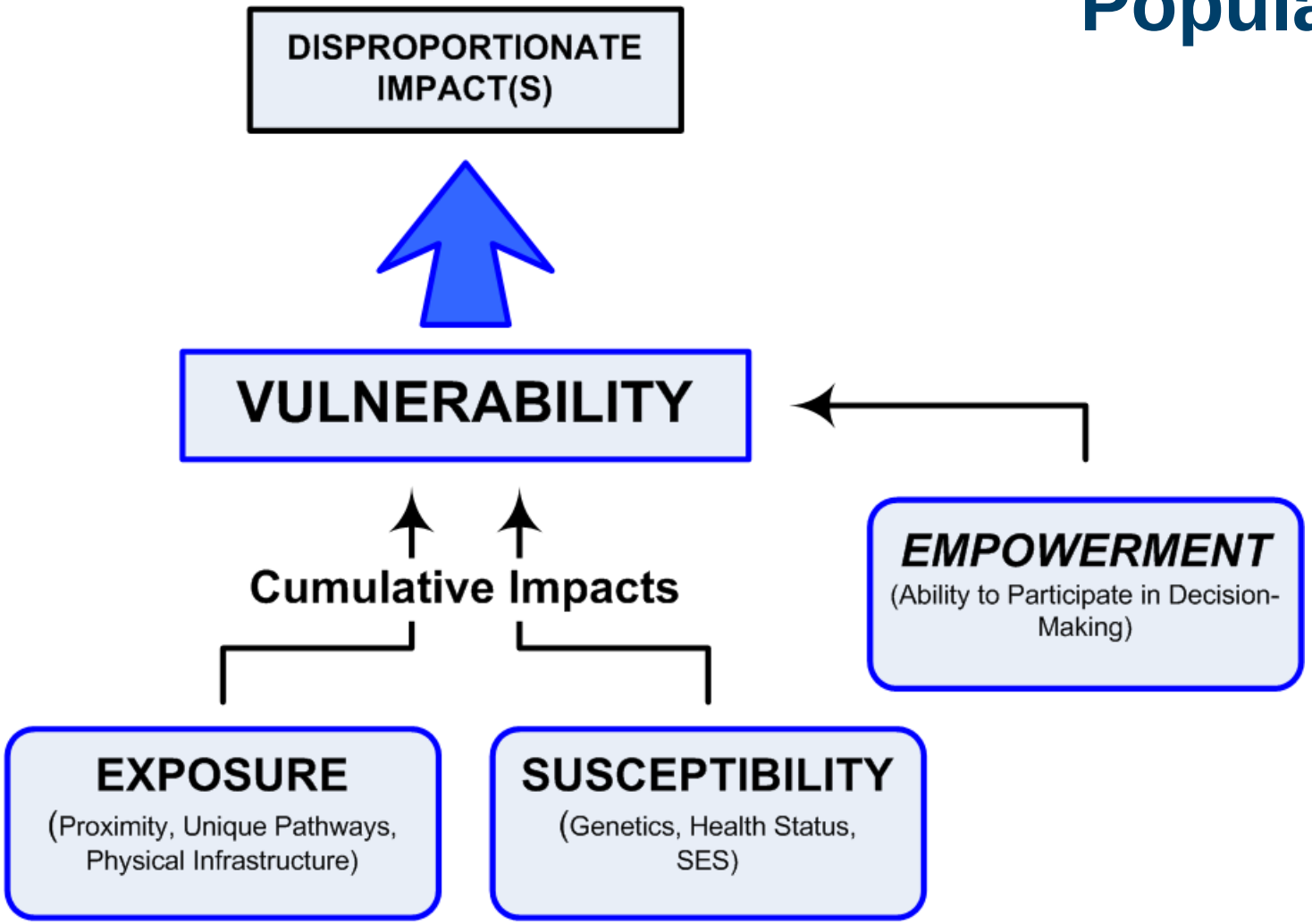
- Plan EJ 2014
- EPA's Action Development Process
  - Interim Guidance for Considering EJ during the Development of an Action
- Strengthening Environmental Justice Research and Decision Making: A Symposium on the Science of Disproportionate Environmental Health Impacts (March 2010)

Elements of Disproportional Impacts*

- Proximity
- Cumulative impacts
- Physical infrastructure
- Susceptible populations
- Unique exposure pathways
- Ability to participate in decision making

* From March 2010 Symposium on the Science of Disproportionate Impacts (see also presentation from Heather Case, EPA/OEJ)

Vulnerable Populations



New ORD Research Portfolio

- Air/Climate/Energy (Dan Costa)
- Safer Products for a Sustainable World (Bob Kavlock)
- Sustainable Communities (Rick Linthurst)
- Sustainable Water (Jennifer Orme-Zavaleta)
- Human Health Risk Assessment (Becki Clark)
- Homeland Security Research (Jon Herrmann)

Aligned with the Administrator's Priorities

ORD Research

- Conducted by ORD scientists
- Conducted extramurally (primarily through ORD's National Center for Environmental Research)
- Promoting innovation is an ORD priority
  - Established an ORD Innovation Office
  - Created an internal innovation grants program (Pathfinder)
  - Modify criteria in grants and cooperative agreements to incorporate innovation

Technology

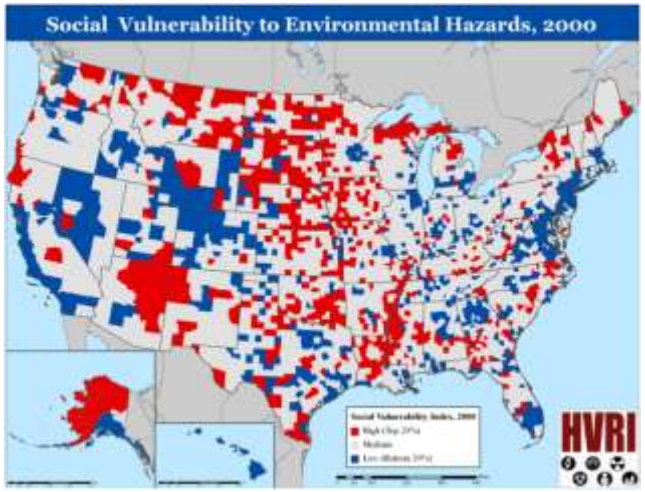
- **Data collection technology** (DCT)
  - Provide data and other information for use in environmental decision-making
- **Data management and analysis technology** (DMAT)
  - Ensure that environmental decisions are made using the best information possible
- **Solutions technology** (ST)
  - Remove contaminants or prevent them from entering the environment

Desirable characteristics: Innovative, cost-effective, and easy to use

Data Collection Technology

- Measurement/analytical methods (e.g., broad spectrum or contaminant-specific, low-cost, on-site)
  - Examples: Lead test kits, on-site monitors for near roadway air pollution exposures, passive monitors for pesticide exposure
- Automated technology for survey data (questionnaires)

Data Management and Analysis Technology



Social Science Quarterly: 84(2) 242–261 (2003)

- Models for comparing exposures and risk for different communities
- GIS-based tools for screening communities for EJ concerns (e.g., SOVI)
- Methods for aggregate exposure and cumulative risk assessment
- Web-based frameworks for conducting exposure and risk assessment (c-FERST, t-FERST)
- Communication technology to provide communities with information for decision-making (e.g., visualization)

Solutions Technology

- Community-based technology to reduce waste and pollution created during production and consumption
  - Example: Biodiesel project in Ambos Nogales
    - Reduce disposal of waste vegetable oil and grease
    - Improve air and water quality
- Low cost, home-based pollution reduction and elimination technology
  - Example: Combining technology and education in asthma interventions
- Emphasis on green technology/chemistry

Evaluating Technology Needs

- Recommend the evaluation of technology needs in the context of:
  - What is the technology?
  - Who will use it?
  - How will it be used?
  - What is the anticipated impact?

Technology – Community Actions

What is the technology?	Who will use it?	How will it be used?	What is the anticipated impact?
Web-based exposure and risk assessment frameworks (DMAT)	Scientists and public health professionals in communities	Identify and prioritize risks in a tribal community	Empower communities to assess exposures and risk
Low cost monitor(s) for criteria air pollutants and air toxics (DCT)	State, local and tribal governments	Provide air quality data that are spatially comparable to SES data for EJ analysis	Compare exposure of communities near roadways to national/regional levels
Conversion of cooking oil/grease to biodiesel (ST)	Local businesses	Reduce disposal of waste oil/grease	Reduce risk, improve water and air quality