

Assessing the Health Effects of the Gulf Oil Spill: Research Methodologies and Data Sources

William H. Farland, Ph.D.
Vice President for Research
February 17, 2010

*Research at Colorado State University-
Local Discovery...Global Impact*

**Colorado
State
University**

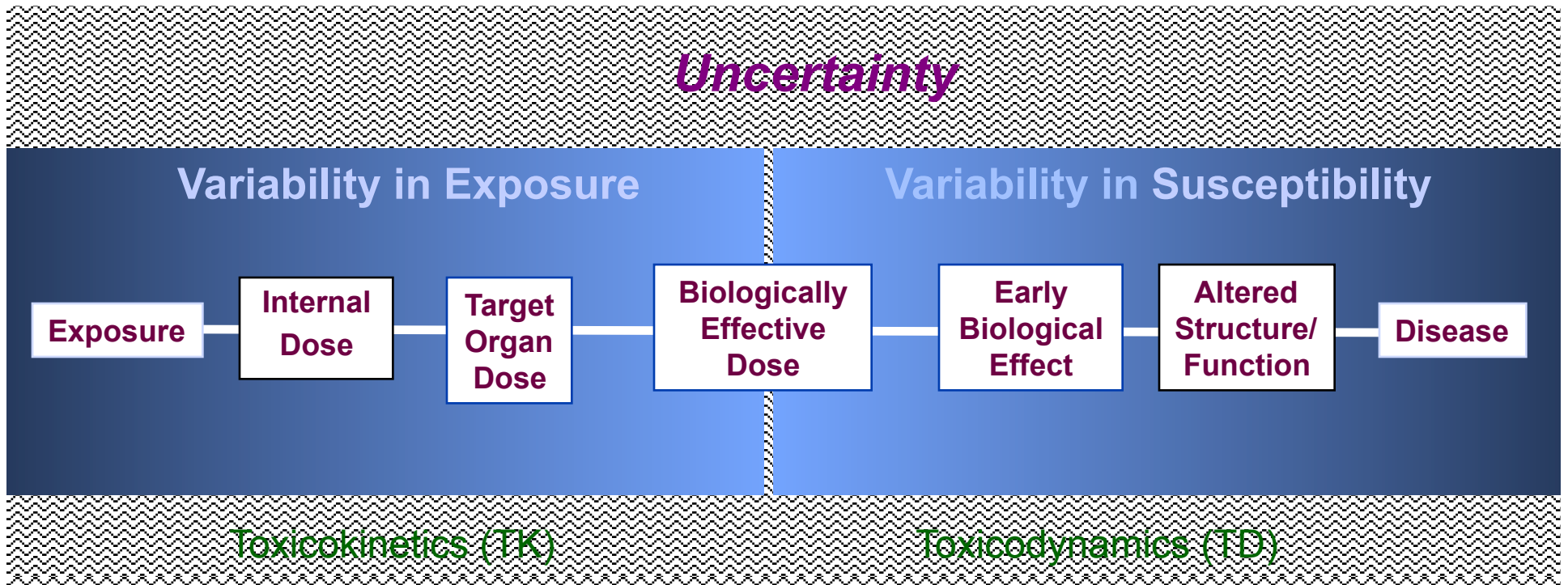
Outline for Today's Talk

The science of risk assessment is evolving to focus on the “real world” need to address complex chemical exposures in the environment.

To meet this challenge, better and different data and innovative tools and approaches must be developed.

A partnership of environmental health professionals in the public (local, state, federal) and private sectors (environmental, academia, industry) will be needed to address these emerging challenges.

Exposure (or Stressors) May Alter Biology and Lead to Adverse Impacts



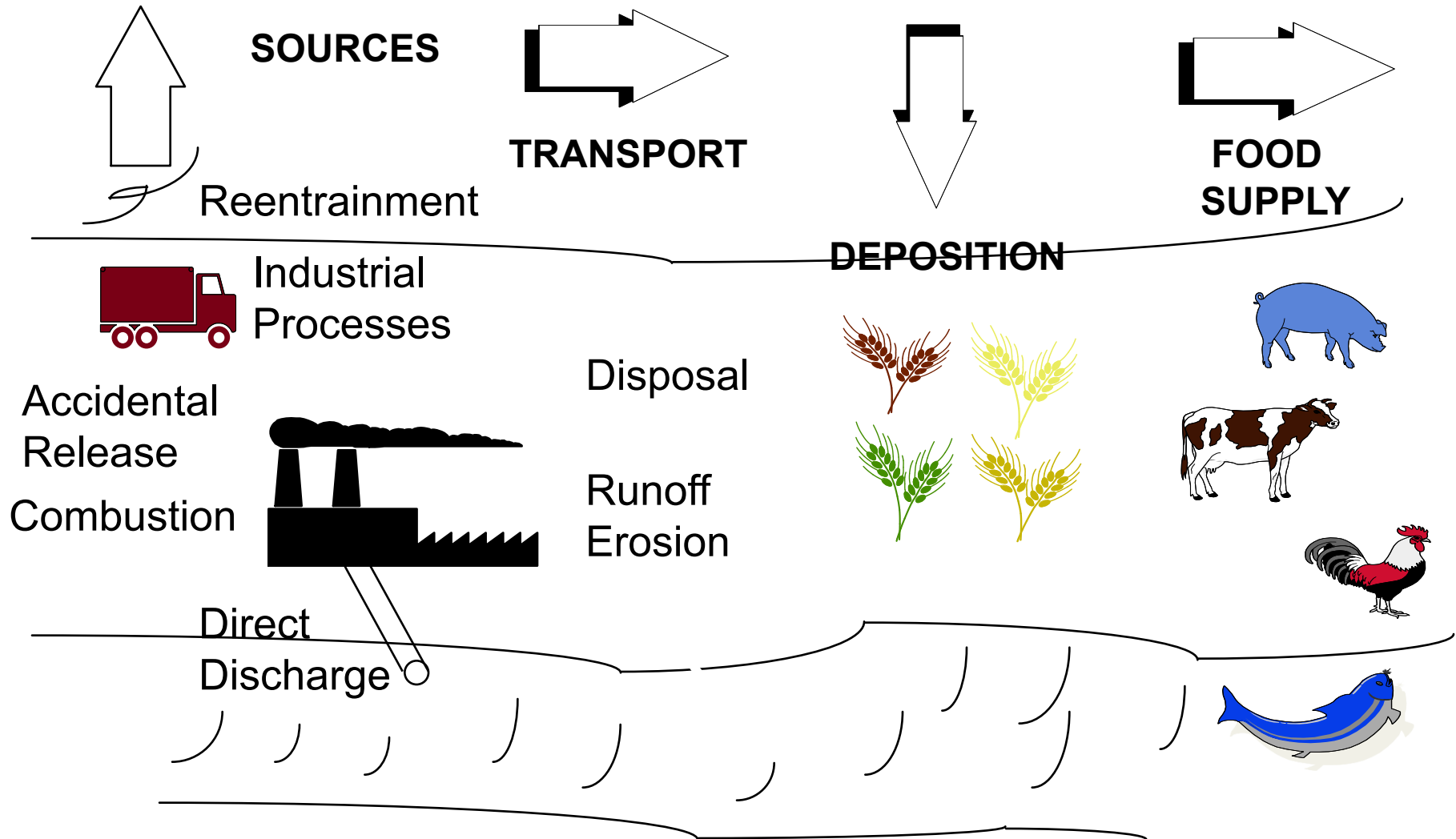
TK = How does an organism handle a toxic chemical?

TD = How does it respond?

Opportunities for Improved Understanding of Hazard and Risk

- Source to Receptor
- Exposure to Dose (TK)
 - Biomarkers of Exposure
 - Population Perspective
- Dose To Response (TD)
 - Biomarkers of Response
 - Systems Biology Approach
 - Population Perspective

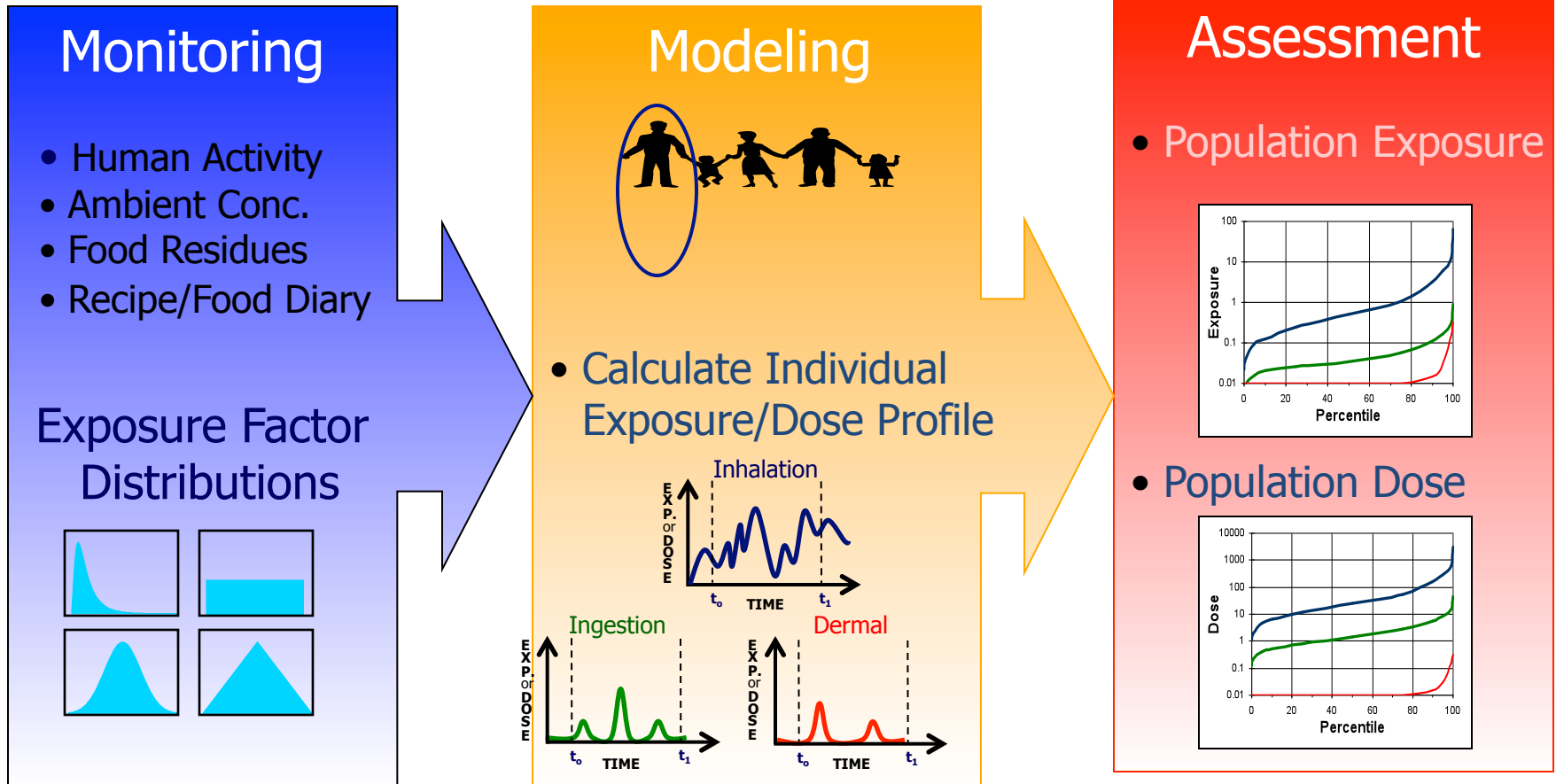
Environmental Fate and Pathways to Human Exposures



Sample Data Sources for Estimating Gulf Oil Exposure/Risk

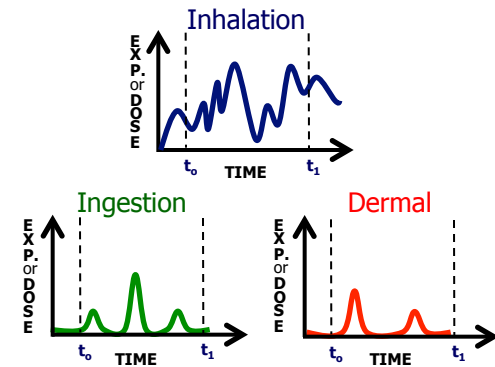
- ✓ Air Sampling (volatile organics, particulates)
- ✓ Water sampling (drinking water systems, individual wells)
- ✓ Food sampling (seafood, creel surveys, game monitoring)
- ✓ Activity Patterns (use of PPE, Gulf-based recreation, migration)

Estimating Exposure



Emerging Challenges in Assessing the Current Situation

- **Aggregate and Cumulative Exposure**
 - multiple chemical/stressors
 - additivity to background
- **Uncertainty and Variability and Probabilistic Methods**
 - Move beyond point estimates to distributions
- **Lifestages & Special Populations**
 - **Lifestages:**
 - Children
 - Elderly
 - **Ethnic/Tribal populations**
 - **Highly vulnerable groups**
 - Genetic predisposition
 - Pre-existing disease



Summary

- ❖ **Opportunities exist to understand routes to and profiles of exposure to Gulf oil constituents.**
- ❖ **These data will assist in developing approaches to exposure prevention and disease surveillance.**
- ❖ **Because of the complexity of the situation, data collection must be comprehensive and long-term.**