

US EPA
Collaborative Science & Technology Network for
Innovation

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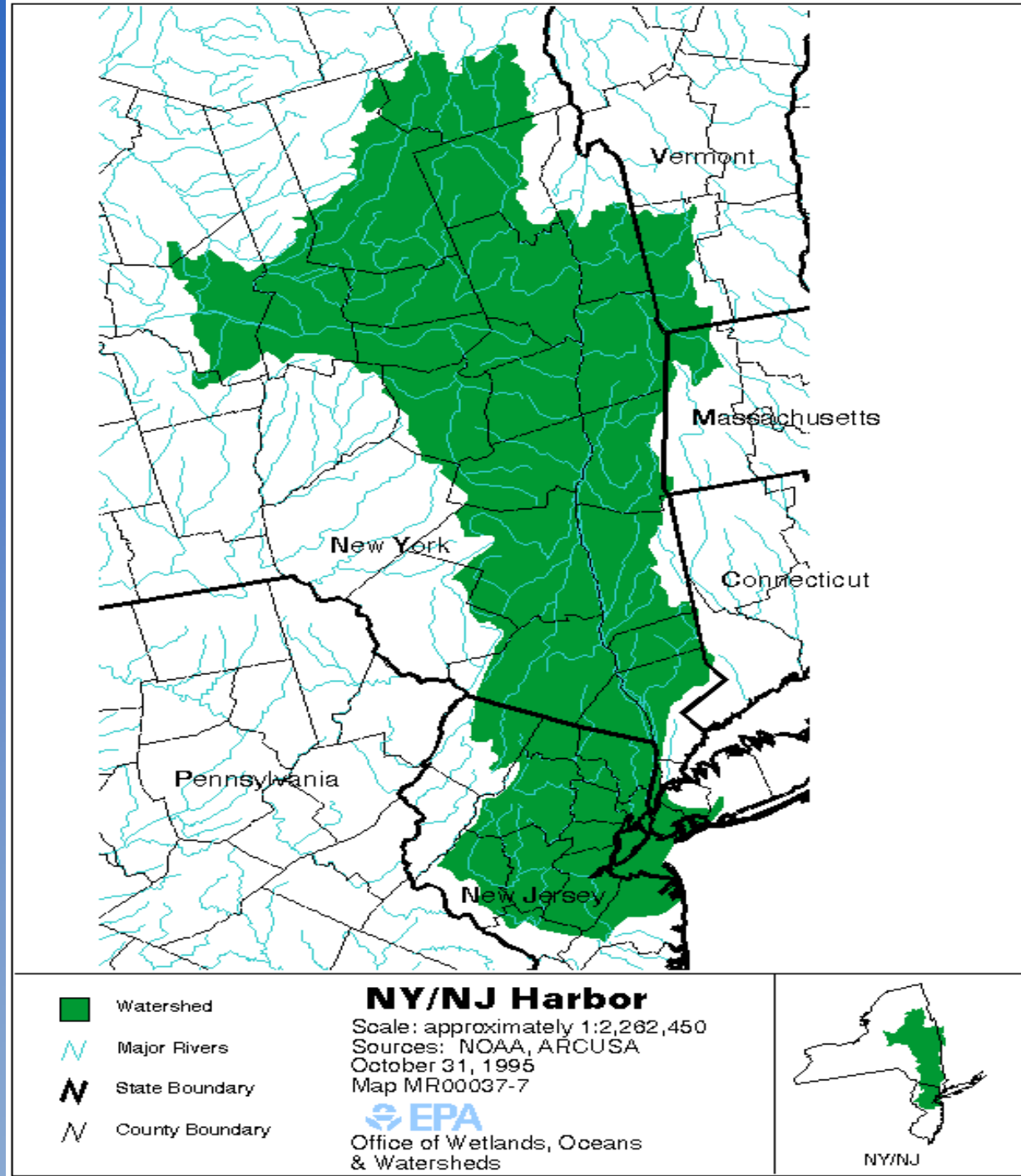
Project Overview and Progress Update
Industrial Ecology, Pollution Prevention & the NY/NJ Harbor

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& the NY/NJ Harbor*

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Industrial Ecology (IE)

Goals of IE:

- # Materials and energy optimization
- # Ecological and human health
- # Environmental equity

Systems-based approach

- # Model the flow, transformation and dissipation of energy and materials through various systems (industrial systems, business and consumer communities, ecological systems) [Descriptive]
- # Seeks to optimize the total industrial materials cycle from virgin material to finished product to waste disposal in order to lessen the impact of these processes on the environment [Prescriptive]

Analytical tools:

- # Material flows, substance flow assessments
- # Life cycle analysis
- # Design for the environment, life cycle design



Overall Goals of Project:

- # **Identify the locations in five toxicant cycles (Hg, Cd, PCBs, dioxins and PAHs) where pollution prevention (P2) would most efficiently contribute to long-term reductions in loadings to the harbor**

- # **Develop practical P2 strategies that address toxicant releases / emissions**

- # **Encourage implementation of the recommended actions by integrating stakeholders into the research and policy process**
 - Stakeholders Consortium includes: environmental groups, industries, trade associations, labor, academia and government



Why a consortium?

- # **Emphasizes public involvement and communication:**
 - New Paradigm: Inform, Include, Decide
- # **Benefits of engaging the public:**
 - participants provide valuable information and guidance
 - promote implementation of recommended strategies
- # **Open process acts as educational forum**
 - Ensures continuity in participation
- # **Alternative valuation process** — important when monetary valuation of benefits is not available
- # **Diversity of sponsors**

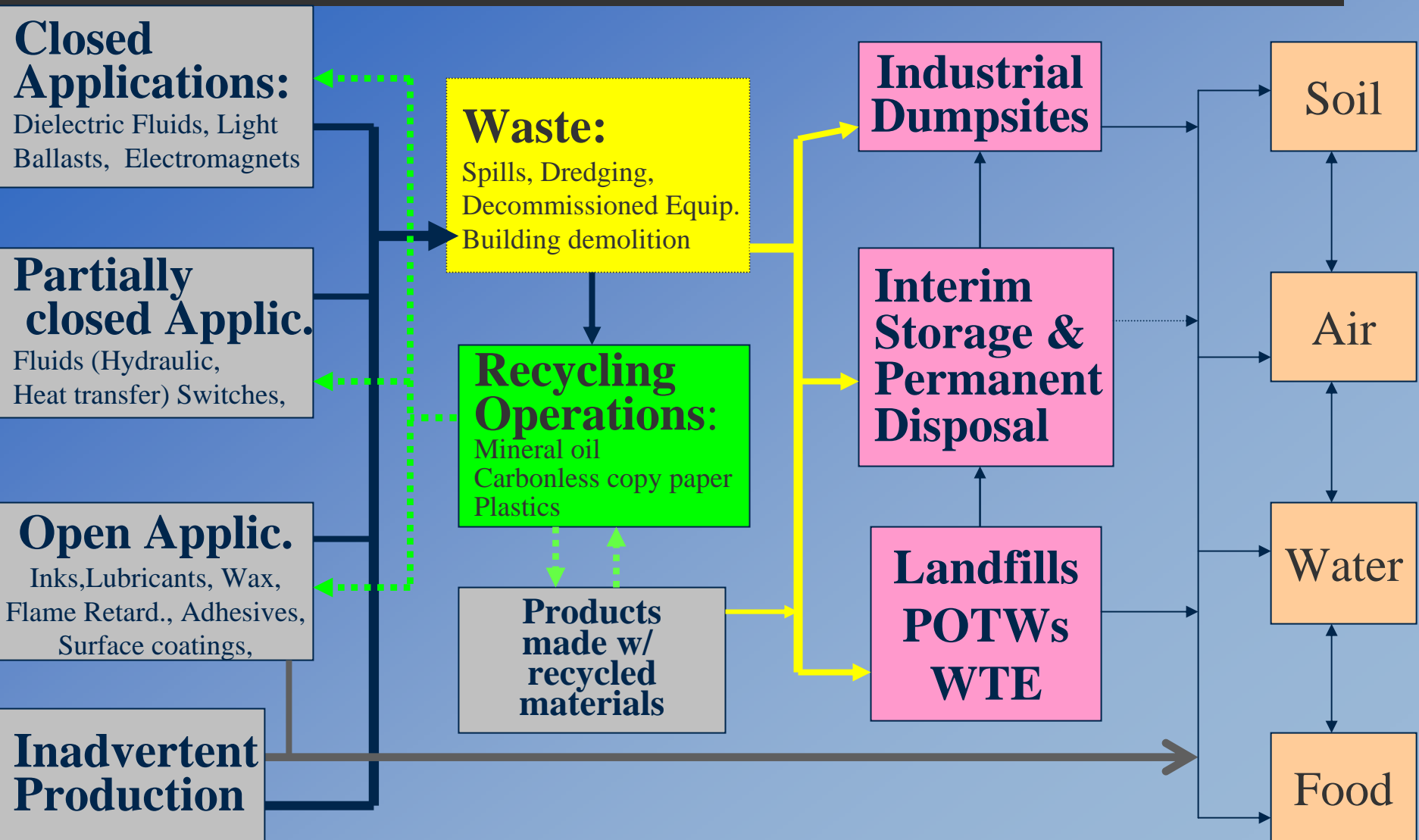


Step 1: Research

- # **Identify sources**, flows and sinks for contaminants through the region including products, processes and sectors that produce, use and/or release these contaminants
- # **Develop a Substance Flow Assessment**, quantifying contaminant flows and transformations (from extraction, production, consumption, to post-consumption, including disposal rates) [Industrial Ecology assessment]
- # **Quantify contaminant flows in and out of the Harbor** – through air, water and land [Harbor Mass Balance]
- # Compare two assessments [IE & MB]

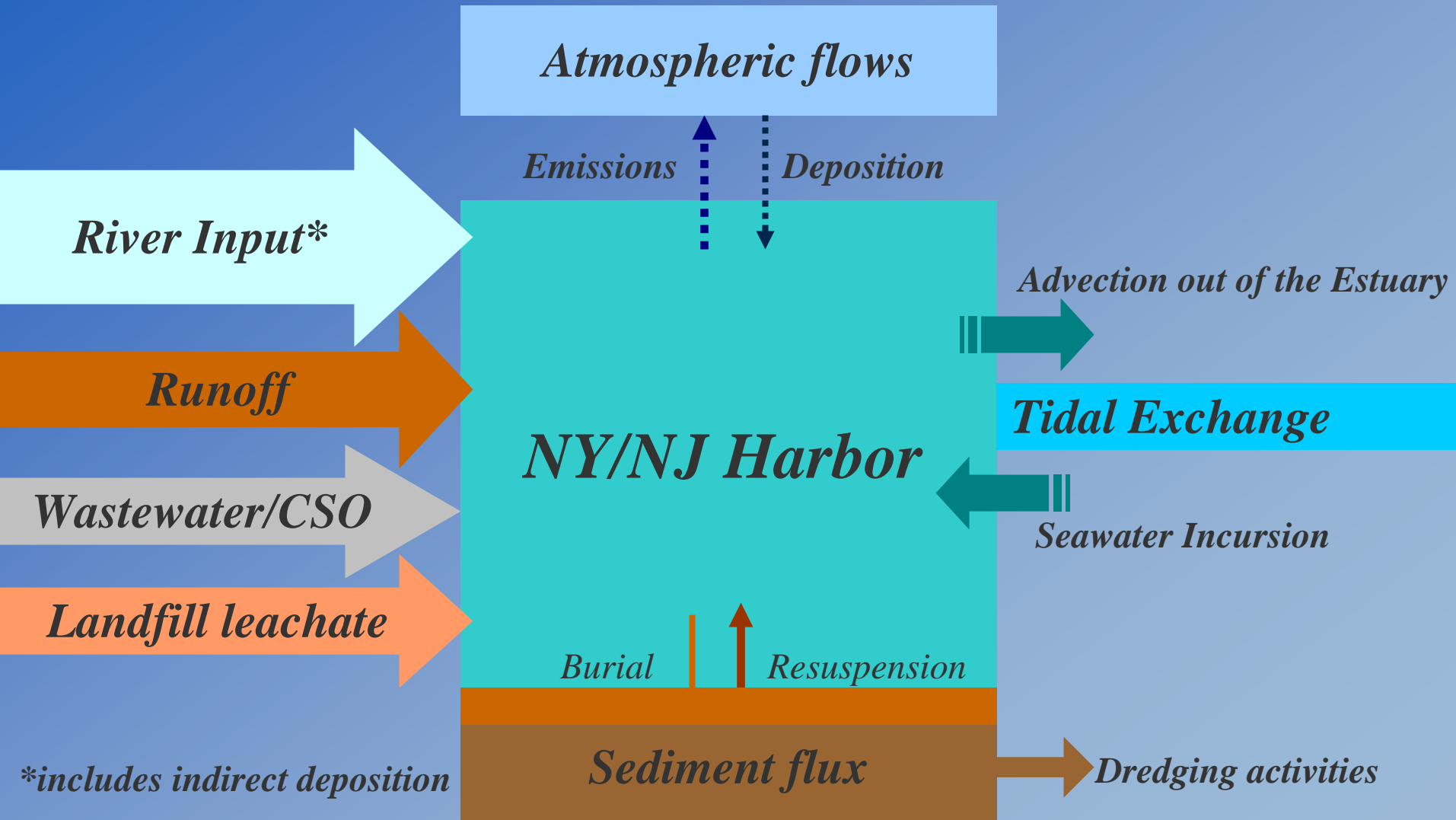


Understanding contaminant movements (PCBs) [IE analysis]



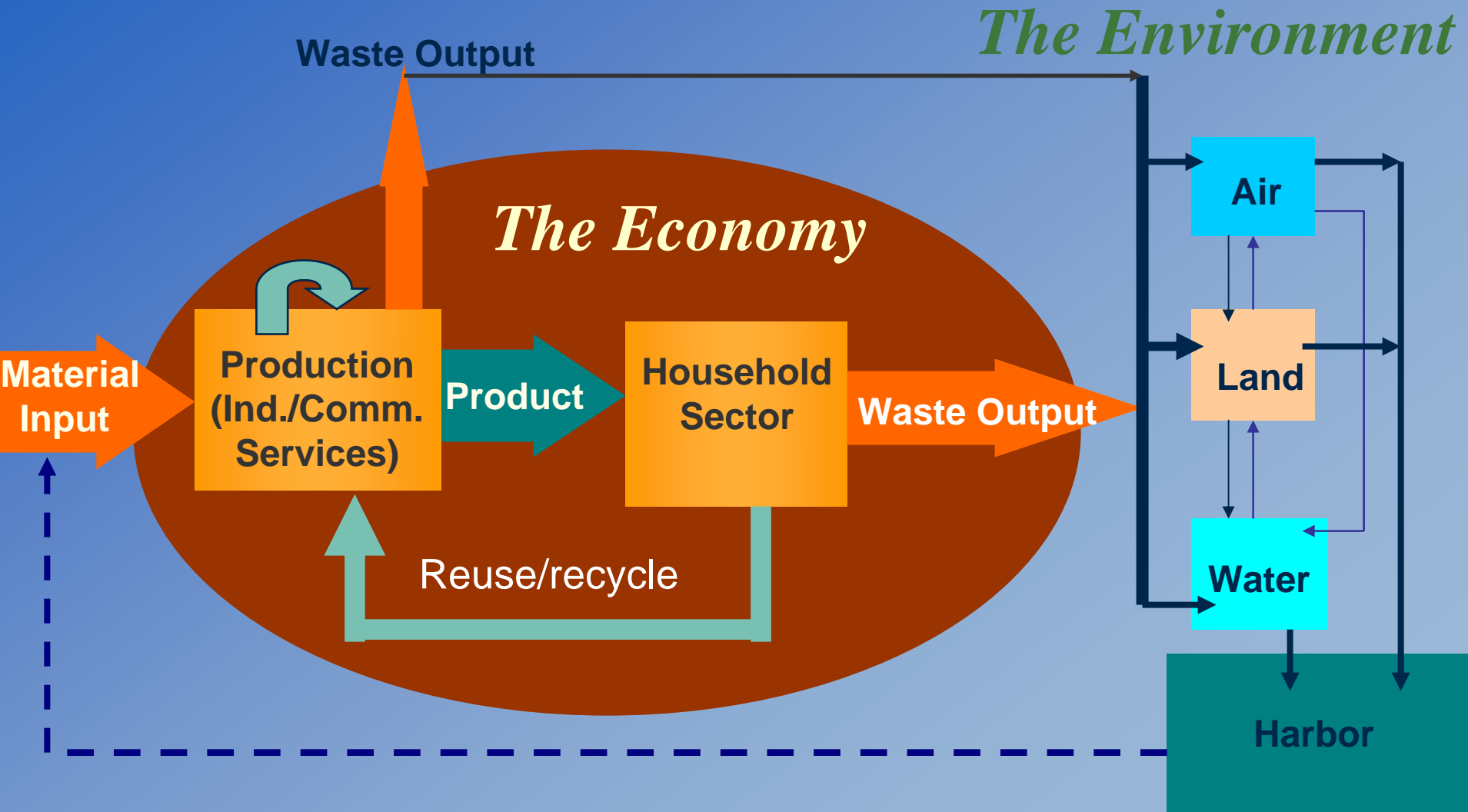


Mass balance for NY/NJ Harbor





Modeling system interactions: integrating the IE & MB assessments



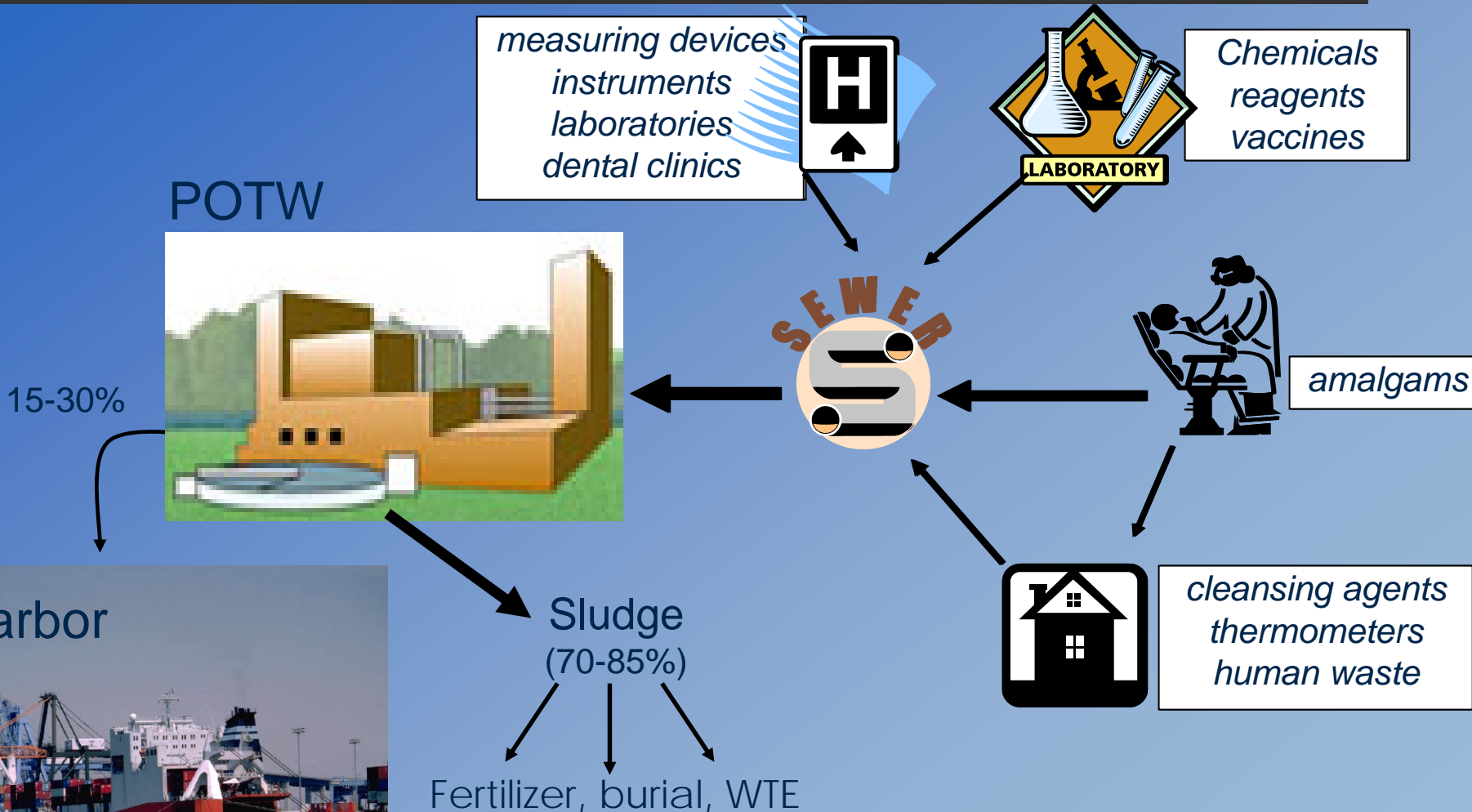


Step 2: Developing policy recommendations

- # **Identify P2 strategies that result in the greatest reductions**
- # **Develop P2 recommendations with Consortium**
 - # Find leverage points for intervention. Identify economic sectors, substitute materials, technologies and/or alternative practices that provide effective leverage for policy tools.
 - # Public Opinion Survey / Sector meetings
 - # Determined total costs associated with P2 plan
- # **Implementation**
 - # Identify partners
 - # Public Outreach
 - # Voluntary actions & challenges

Primary versus final outflows

Identifying all flows & stakeholders through IE





Summary: Value added of IE

- # Material Flow analysis complements environmental Mass Balance for the NY/NJ Harbor
- # Tracing contaminants back to the primary sources
- # IE inventory helpful to identify all contaminant sources, including the cumulative effect of small quantity generators (SQG), not just LQG
- # Capacity to identify and involve all agents and to balance the policy debate.
- # Using indicators (environmental, socio-economic) enriches the policy debate



Data availability/requirements

Mercury, Cadmium

- # Still commercialized (produced, used)
- # National Material Flows Available from US Geological Service
- # Industry data by sectors; some data by products

PCBs

- # Production is banned but still inadvertently produced and used in products
- # No regional material flow analysis
- # National Inventories from 1980s only

Dioxin, PAHs

- # Not commercialized, (by-product)
- # No national/regional material flow analysis, only emissions inventory



Industrial Ecology Resources

The Journal of Industrial Ecology:

<http://mitpress.mit.edu/catalog/item/default.asp?ttype+4&tid=32>

Pollution Prevention and Industrial Ecology:

www.umich.edu/~nppcpub/resources/ResLists/Ind.Ec.html

Industrial Ecology Compendium:

www.umich.edu/~nppcpub/resources/compendia/ind.ecol.html



For copies of documents and more information about our project:

<http://www.nyas.org/programs/harbor.asp>

“Pollution Prevention and Management Strategies for Mercury in the NY/NJ Harbor”

“Survey of Public Opinion: Opinions of Stakeholders on Issues that Concern the Future of the Harbor”

“Pollution Prevention and Management Strategies for Cadmium in the NY/NJ Harbor”

“Pollution Prevention and Management Strategies for PCBs in the NY/NJ Harbor”