



**ENVIRONMENTAL  
PROTECTION AGENCY**

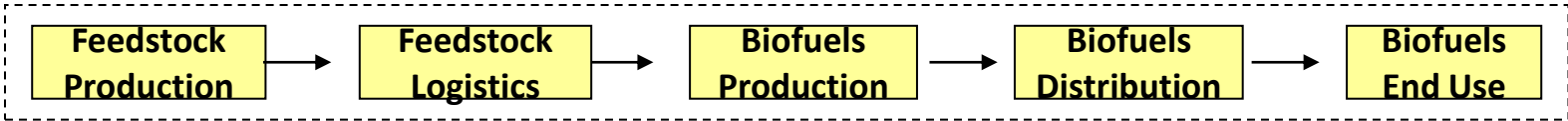
# Research Themes – Aligned Program & Regional Needs with Existing ORD Capabilities

- Impacts of **GM materials & invasive species**
- Impacts of **algae** production & conversion
- National and/or **regional** air/water quality and **ecological impacts** associated with crop/residues/other cellulosic feedstock production
- Emissions, wastes, & by-products of **conversion technologies**; releases, fate & transport of contaminant; identify risks/mitigation options
- Assess benefits & impacts of using **GM microbes in conversion technologies**
- Characterize physical, chemical, and toxicological characteristics of **fuel blends; releases, fate, transport** within distribution infrastructure, focusing on USTs, blending terminals, emergency response, and remediation
- Develop protocols and conduct **verifications of leak detection systems'** performance with varying biofuel blends
- Characterize emissions, fate, transport, exposures, and health **risks from vehicles using various fuel blends**
- Future scenarios for **sustainable biofuel supply chains**

# Distribution of EPA Research Across Biofuels Supply Chain

Report to Congress on the impacts to date and likely future impacts of the requirements of Section 211(o) of CAA

Design of sustainable biofuels supply chains



Assessing ecological impacts from feral crops and gene flow from biofuel crops on ecosystem services

Augmented modeling of water, air, and soil quality impacts of biofuels in the Midwest

An integrated eco-hydrologic modeling and decision support framework to assess effects of biofuel scenarios on ecosystem services

Natural gas, nitrogen fertilizer, and N2O: Addressing gaps of biofuels impacts on nitrogen cascade

Issues associated with waste glycerol combustion for biodiesel production

Environmental consequences of biomass fast pyrolysis for biocrude production

Framework to manage impact of spills from USTs on ground water for municipal supplies

Evaluation of leak detection testing protocols and equipment functionality when used for biofuel applications

Exposure impacts of photochemically-converted biodiesel exhausts

Biofuel combustion constituents effects on cardiopulmonary responses in rodents and humans

Impacts of biofuel use in transportation sector on air emissions, air quality, exposures, and adverse health effects