#### Non-point Source Pollution Control and Public Engagement: A Case Study of US

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## Non-point source (NPS) pollution

- Polluters: Agricultural sector livestock industry, residence, golf course,,, .
- Unspecified number of polluters involve.
- Assigning responsibility for non-point pollution loads is uneasy.
- Direct monitoring and treatment is practically impossible
- Use of a proxy to understand the pollution situation.
- Numerical and narrative standards.
- Direct regulation seldom applied in the practice.

#### Objective : Addressing public engagement regarding Non-point Source Pollution control in the US grain-belt



## Mississippi River Basin



https://www.epa.gov/mshtf/mississippiatchafalaya-river-basin-marb

## Mississippi River Basin

Mississippi River Basin

- Account for 65% of US harvested crop land (USDA)
- Produce 80% of corn, soybean, cotton, and rice (USDA)
- Agriculture account for 7 million metric tons of nitrate influx in the Gulf of Mexico (the largest source of N emissions) (USGS)
- Its input shows an increasing trend.

## NPS pollution in the Mississippi River Basin

NPS Pollution situation

- Nitrogen and Phosphorous pollution is serious in the Mississippi River Basin – its concentration has been getting higher.
- Cause drinking water contamination, toxic plantswildlife-pests, mass fish kills, shutdown beaches, etc.
- Most States in the Mississippi River basin employed narrative standards – virtually no regulations exist.

#### Questionnaire (Semi-structured interview)

Overview of non-point source (NSP) pollution control

- Role of your agency
- Organizational structure of NPS control
- Monitoring and Regulations

NSP control network

Collaboration with agencies in other locations and other stakeholders.

Civic engagement

- Who are the stakeholders?
- To what degree and how they are engaged in NSP control?

Current and future challenges

– Technological, Financial, Human resource, Legal,,,









## Case 1: Department of Agricultural Economics, Louisiana State University

- Organization: School of Agriculture (Agricultural science, soil science, agricultural economics,,,) School of Engineering (civil engineering) are conducting research on NPS pollution in the region.
- Role: Understand pollution situations and accumulate knowledge and data environmental/soil information and best farming practices at individual water basin.
- Through agricultural extension service center share the knowledge, technology and information with farmers. Sometimes, they give a warning to the farmers where situations are bad.
- Approach: No regulations on the farmers. Think cost reduction is very important so that the University researchers have developed farming methods to minimize mitigation cost for different crops and different counties/regions.

#### Network

- Network : Share information and knowledge on BMP with Louisiana State Government of Environment Quality, Agricultural and Forestry.
- Frequent collaboration on soil and pollution research with Federal Gov. (USDA and EPA) in the context of Water Clean Rule.
- Most farmers are run by family (exception is plantation firms for sugar cane). So, cost is an one of the most important factor for NPS pollution control.

# Case 2: Surface Water Division, Mississippi Dept. of Environmental Quality

- Approach: Basin Management Approach Best Practice Management Approach, voluntary base.
- Put an emphasis on public engagement.
- Stakeholders are various. Trying to identify stakeholders and to seek information and resources available in individual basins and regions.
- Mississippi NPS program
  - Constructed in 1989 under Water Quality Act (EPA, 1987)
  - Main activity pillar: Education, dissemination, human development, communication
  - Aiming at establishment of autonomous water resource and environmental management.
  - Motivation enhancement: educational programs for Boy Scout and elementary school.

Network with other organizations Departments within the state government: Agriculture, Land management, Urban planning,,), County, NCA, USDA, EPA, Mississippi State University • Gulf of Mexico Alliance: with Fed Gov. State Govs.,

University/research institutes, NPO/NGO. Taskforce is allocated to each state (State of Mis. In charge of Coastal Resilience Team)

Mississippi River Basin Alliance:

Alliance of more than 80 organizations in the MSR Basin.



### Case 3: Mississippi Water Resources Research Institute, Mississippi State University

- Play a platform role in connecting researchers and institutes in the university dealing with water environment and resources. Aiming at finding problems and contributing to solving them by using University's resource. Collecting data and information on water resource, and pollution conditions within Mississippi State.
- The vice chairman worked for State gov. and has a strong connection.
- Now trying to launch a new center for research, education, and practice in collaboration with 18 universities, State Gov.

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## Discussion

- Louisiana State University: There are frequent interactions between researchers and farmers. Most information is open to the public and accumulation of science knowledge and date is abundant. But, researchers do not stress public engagement.
- Mississippi State Gov.: Aware of regional characteristics: Conditions and (human and capital) resources available are different by water basin→ Utilizing local and scientific knowledge, constructed NPS pollution control guideline.

- Given the pollution situation current approach (no regulation/ enforcement exist. though addressing the importance of public engagement, public is to be reactive) may not be sufficient.
- Minnesota and Wisconsin States (Minnesota Pollution Control Agency (MPCA) and the Wisconsin Department of Natural Resources ) are proposing "Civic Governance Approach" for NPS pollution control: now define necessary steps to implement the approach and identifying its strength/weakness and challenges.