

IDENTIFYING OIL SPILL HAZARDS IN NORTH DAKOTA, THROUGH HYDRAULIC MODELING AND CONSERVATION PLANNING

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1 ABSTRACT

North Dakota is the second largest in oil production in the United States with 85 paramount oil spills within the last 20 years. In 2006, a broken pipeline burst more than a million gallons of brine wastewater into Charbonneau Creek in Northwestern North Dakota, altering ecosystem services and the residents who relied on the land and surrounding water bodies. These Oil spills are extremely unpredictable, with little available information of when, where and how they occur. While most literature focuses on the reporting protocol and response actions, this study will propose an analytical strategy to estimate the environmental threat of oil spills to water resources through environmental planning. Geospatial and hydraulic modeling tools will be introduced using USGS StreamStats for watershed-based drainage delineations, basin characteristic visualization, and streamflow estimation. Impacted land uses will be examined and analyzed to inform environmental intervention. The result will present an efficient framework for hazard identification, vulnerability analysis and ecological planning for an endangered watershed area on Fort Berthold Reservation. The goal is to produce new perspectives on possibilities of creating a more resilient and sustainable tribal community.

1.1 Keywords

Geographic Information System, Hazard identification, Oil Spill, Conservation Planning