

# Crude Move

## GREAT LAKES WEBINAR SERIES



## Crude Oil Movement in the Great Lakes Basin, Properties and Pathways

Bradley Hull, PhD, *John Carroll University*

*Crude oil has moved to and through the Great Lakes Basin for more than 100 years, but new developments in US export policy and growing production in North Dakota, Texas and Canada have drastically shifted traditional oil flow routes, which in turn has given rise to numerous objections. Both businesses and product-users seek to move oil along least cost routes, but also routes that meet complex environmental and social objectives. We need to direct oil along routes that meet multiple objectives simultaneously, making this a “wicked problem” with seemingly competing goals. (Visit [swemorph.com/wp.html](http://swemorph.com/wp.html) for a discussion of the wicked problems concept.)*

### HOW IS CRUDE OIL USED?

Crude oil is the primary source of transportation fuels for airplanes, trains, trucks and automobiles. Also, through its petrochemical uses it is an important feedstock for numerous industrial, agricultural, residential and commercial applications—fertilizers, pesticides, paint, acrylic fibers and a myriad of plastics, to name a few. The Great Lakes Basin is home to many major refining and petrochemicals companies, all of which depend on low-cost supplies of oil.

### HOW DOES OIL MOVE TO AND THROUGH THE GREAT LAKES BASIN?

Over the past many years, a complex network of pipelines and rail routes has been developed to move our oil. In the 1970s and 1980s, oil moved by pipeline from the Texas and Oklahoma oil fields to the Basin. As these fields became depleted, oil from foreign sources was delivered by pipeline from the US Gulf Coast to the Basin. Foreign imports persisted until additional Canadian oil sources became available at lower cost, and pipeline routes from Canada were expanded. Most recently, with the advent of the Alberta Tar Sands and North Dakota oil, rail routes have been added to the planned pipeline expansions.

*For more information about the webinar series, contact Dale Bergeron, Maritime Transportation Specialist  
Minnesota Sea Grant College Program | 218-726-7672 | [dbergero@d.umn.edu](mailto:dbergero@d.umn.edu)*



## WHAT IS THE ISSUE TODAY?

Objections have been raised to many of the pipeline and rail routes. We seek to identify least cost routes, but the routes must meet complex environmental and social objectives. Thus, we wish to find the “best oil routes” which meet multiple objectives simultaneously, making this a “wicked problem” with seemingly competing goals.

## WHAT ARE THE CONSEQUENCES OF REDIRECTING OIL MOVEMENTS?

Restricting or shutting down oil flow along a particular segment of pipeline can and will have unintended consequences. A few possibilities:

- 1) oil could shift to other less-desirable pipeline routes,
- 2) oil could shift to rail routes, which are inherently less safe and efficient, or
- 3) the oil might be replaced with imported refined products delivered by Great Lakes ships.

As we restrict oil moving into the Great Lakes Basin along any one route, it will continue move into the Basin by other perhaps less desirable routes.

## HOW DO WE BEGIN TO EFFECTIVELY MANAGE THIS WICKED PROBLEM?

Oil movements have binational, national and regional implications. Demand and price largely determine the flow of crude oil. Changes in crude oil flows can have unanticipated and cascading social, economic and environmental consequences. To make optimal choices we need to use multi-variable, multiple objective modeling systems with input from environmental and social sciences, as well as government and the oil industry itself. In the words of R. Buckminster Fuller, “You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”



Visit the **CRUDE MOVE WEBINAR SERIES** site to watch the presentation, download slides and learn more about the transport of crude oil across the Great Lakes Basin.