Over the Average Life of an Oil Rig

- Drills between 50-100 wells, each dumping 25,000 pounds of toxic metals, such as lead, chromium and mercury, and potent carcinogens like toluene, benzene, and xylene into the ocean, and
- Dumps more than 90,000 metric tons of drilling fluid and metal cuttings into the ocean;
- Pollutes the air as much as 7,000 cars driving 50 miles a day.

Unavoidably Dirty Business

The largest adverse impact is during exploration & production

Oil Spills Are The Most Dramatic and Visible Impact

- **There were an average of 3.3 major oil spills per year. Between 2000-2009**.

- **Accidents** were the main cause of large oil spills with groundings and collisions accounting for 65% the total during 1974-2009. Other significant causes include hull failures and fire/explosions. Smaller spills 38% occur during routine operations especially loading or discharging.

Hurricanes - In 2005, Hurricanes Katrina and Rita destroyed 113 of the oil platforms in the Gulf of Mexico and damaged 457 pipelines.

Human error is largely to blame and transportation of oil is the largest area of risk. (ITOPF Handbook 2010/11)

Hurricanes & Earthquakes Are an added threat in Belize

Environmental Impacts - Oil Spills on Marine Life

Deepwater Horizon oil spill in the Gulf of Mexico off the coast of Louisiana

Enormous Economic and Social Impacts Lasting for Decades

Oil and World Heritage Sites and Don't Mix

- Belize Barrier Reef Reserve System was designated as a World Heritage Site in 1996 .
- All MPAs cover only 13% of the marine territory.

May 18, 2010 **UNESCO concerned about drilling in World Heritage Site**

"There is a policy within the World Heritage convention that World Heritage sites should be off limit to mining and hydrocarbon exploration and hydrocarbon and mining professions in the World Heritage Sites goes against the whole spirit of the convention " exploitation.

MIDAS Workshop at Belize City
February 2010

Chris Holden, Valerie Pasquarella and Marta Ribera
Boston University

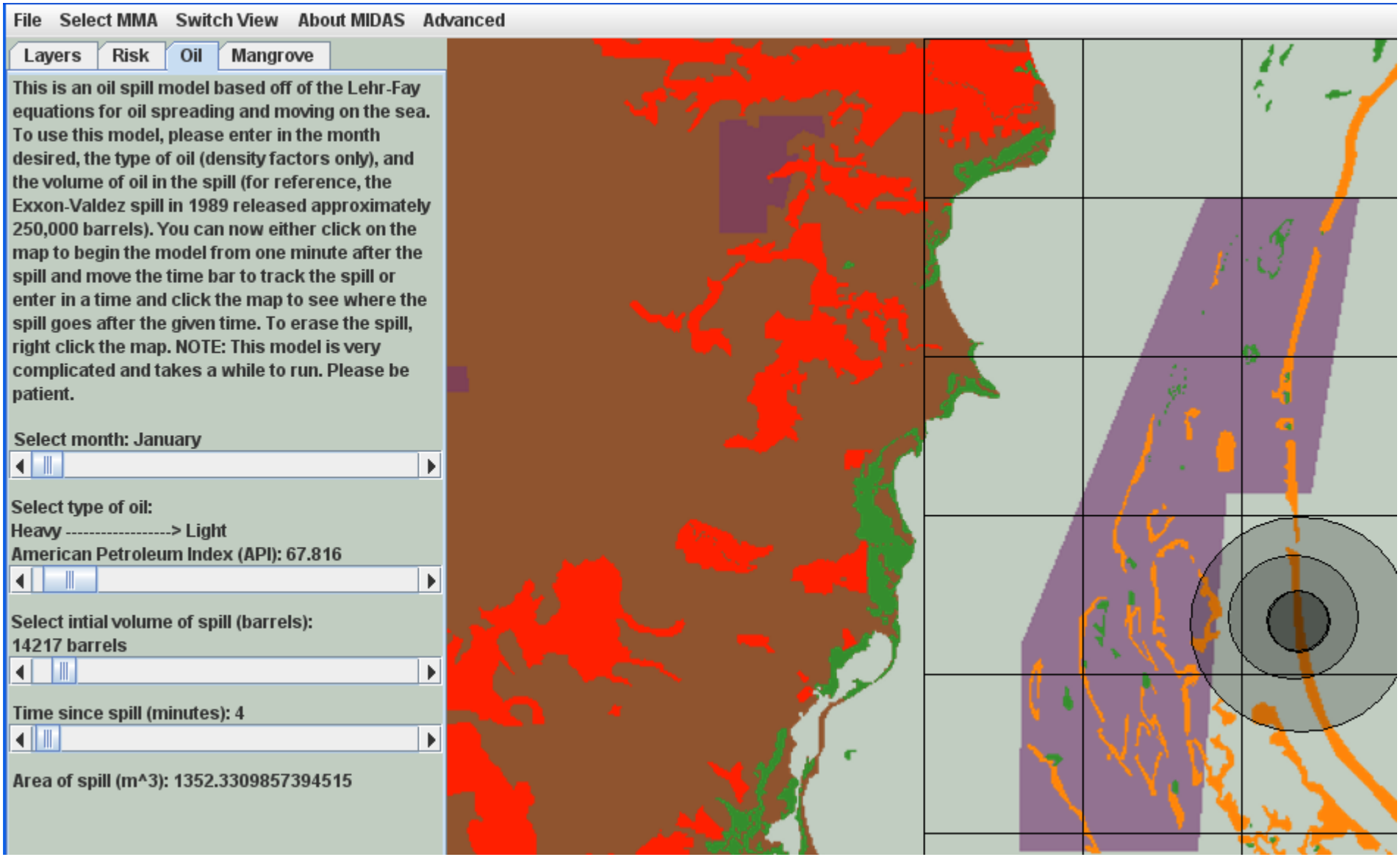
Suchi Gopal, Professor Geography & Environment&
Les Kaufman, Professor Biology
Dr. Burton Shank
Boston University

MIDAS Oil Modeling

- Following Chao et al (2001), we model the advection velocity and horizontal turbulent diffusion (e.g. influence of random wave motion on oil slick) which leads to the displacement vectors at each time step (time step of 1 minute).

- We use the wind and current data to estimate the area based on the major and minor axis of an ellipse model. (A more complete oil model should include mass loss through evaporation, vertical dispersion, emulsification, shoreline deposition, etc. that are not incorporated here because we do not have the data).

- The current and wind data are from NOAA's coastal watch data site and come from RADAR scatterometers. This means that the Belize screen is covered by a 8x8 grid.


File
Select MMA
Switch View
About MIDAS
Advanced
Layers
Risk
Oil
Mangrove
This is an oil spill model based off of the Lehr-Fay equations for oil spreading and moving on the sea. To use this model, please enter in the month desired, the type of oil (density factors only), and the volume of oil in the spill (for reference, the Exxon-Valdez spill in 1989 released approximately 250,000 barrels). You can now either click on the map to begin the model from one minute after the spill and move the time bar to track the spill or enter in a time and click the map to see where the spill goes after the given time. To erase the spill, right click the map. NOTE: This model is very complicated and takes a while to run. Please be patient.
Select month: January
Select type of oil:
Heavy ----------> Light
American Petroleum Index (API): 67.816
Select intial volume of spill (barrels):
14217 barrels
Time since spill (minutes): 4
Area of spill (m^3): 1352.3309857394515