

Odoptu Stage II Project

WEDA Summit and Expo, 2017
Vancouver, B.C.



Modules – 2600 Tons, 100m x 30m x 25m



Natural Waterway



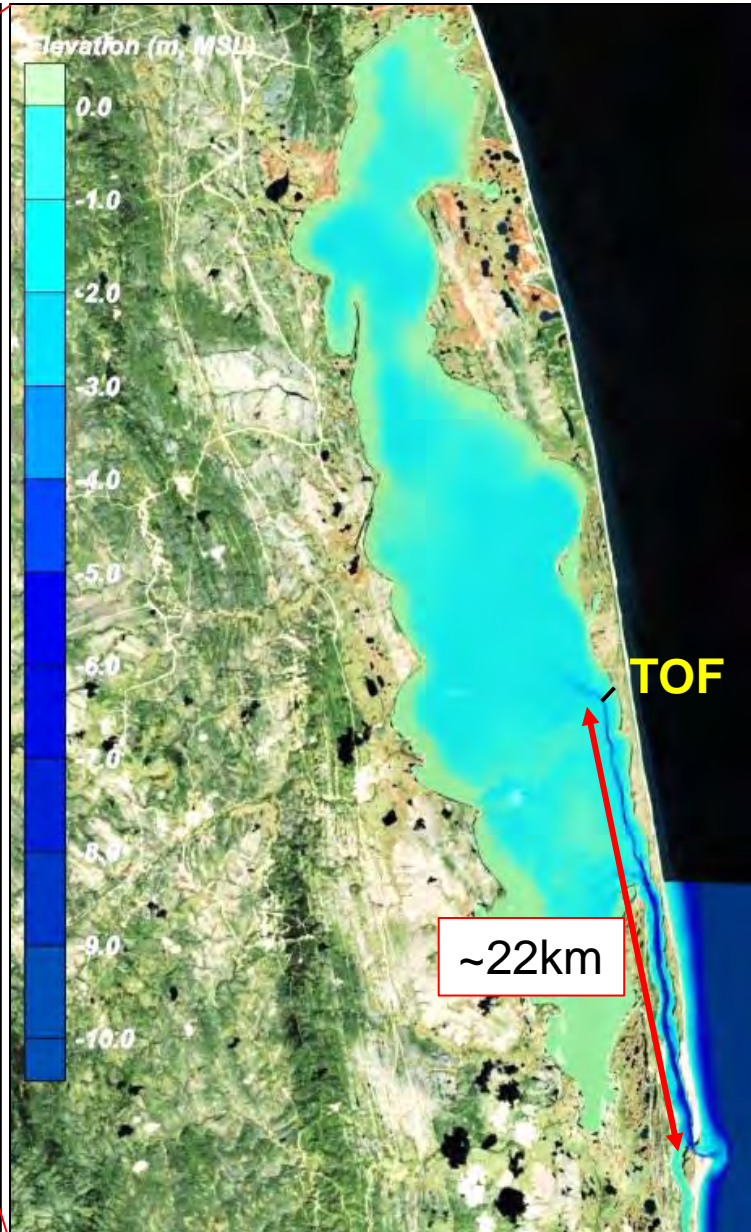
Temporary Offload Facility



MODULE TRANSPORT OVERLAND – TO INSTALLATION



Site Location



Piltun Bay Conditions



BAY

WATERWAY

ENTRANCE

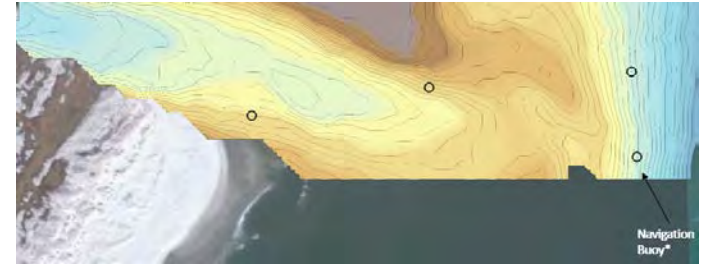
BAR

TOF
22km →

WAVES, WIND, TIDAL CURRENTS, SHOALS, SEDIMENT MIGRATION, FOG, ICE

Key Challenges

- High energy wave regime
- Highly dynamic sediment transport
- Limited site specific data
- No dredging permitted
- Ice (until June 15th)
- Russian regulatory
- Many other (not presented)



June 6th, 2017



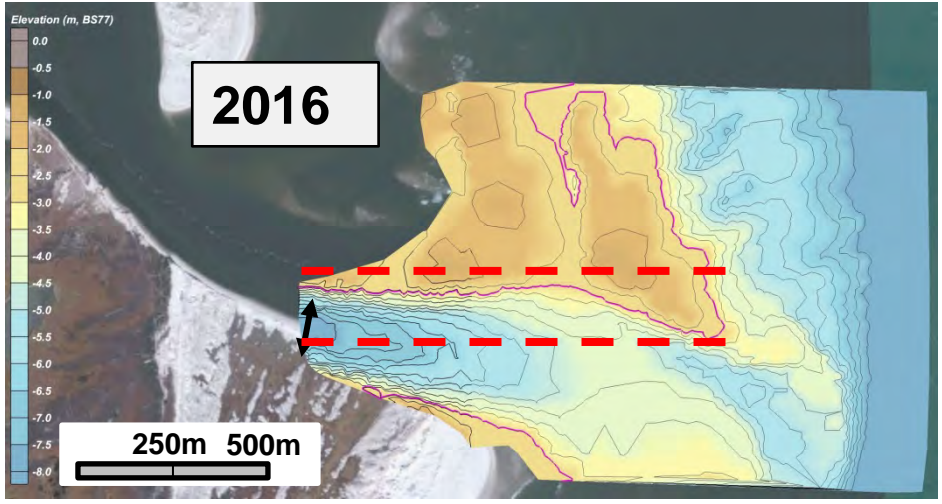
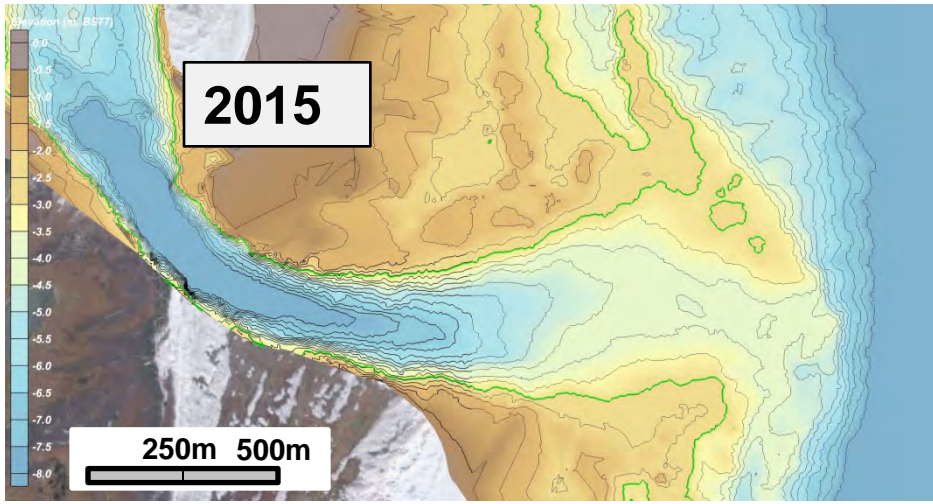
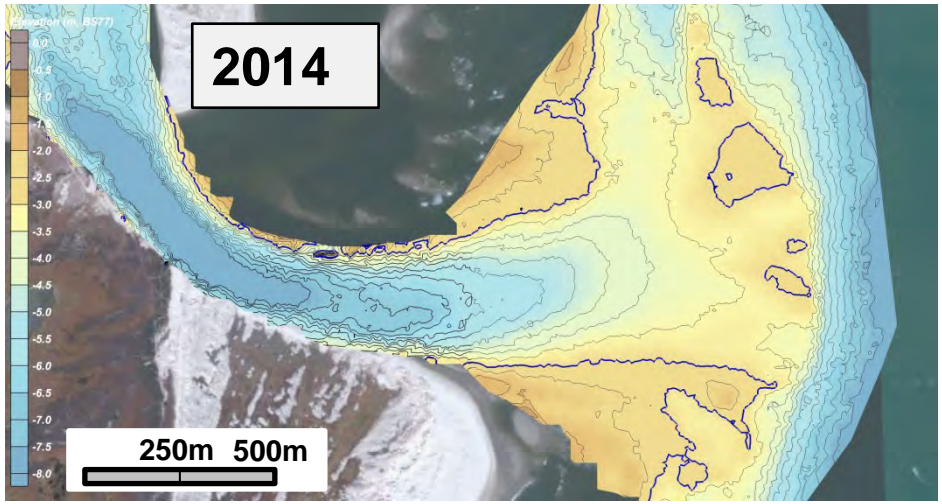
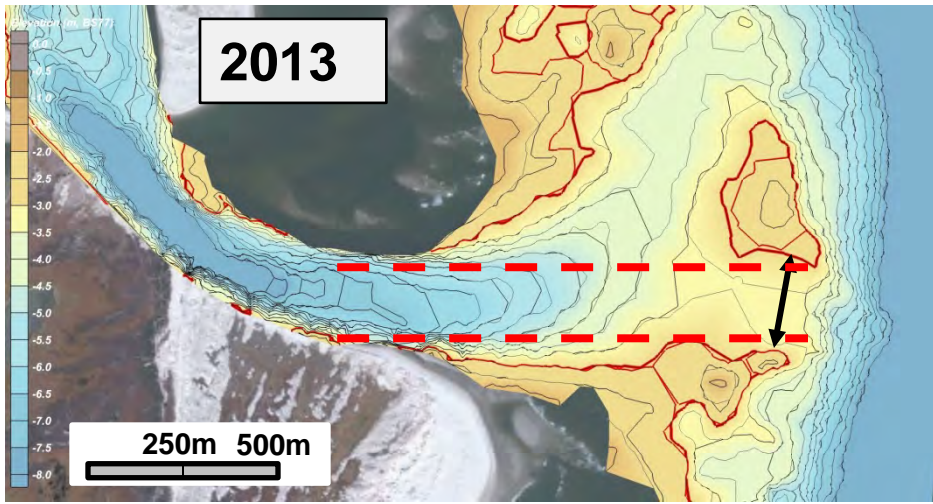
Key Questions

- Can large (2600 ton) modules be delivered to remote, never navigated area of Sakhalin Island, without dredging?
- What is the risk to safe navigation under such dynamic entrance conditions?
- Can 19 barges be delivered, and modules offloaded, with no risk to safety during one season?



Geomorphologic Analysis

3 meter depth contours. Barge Draft ~2.3m



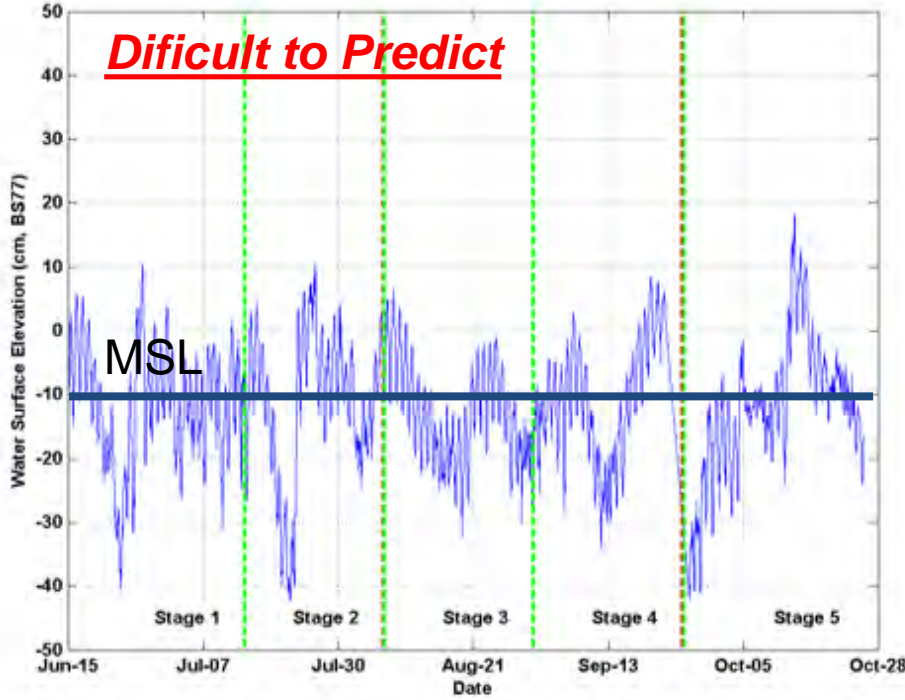
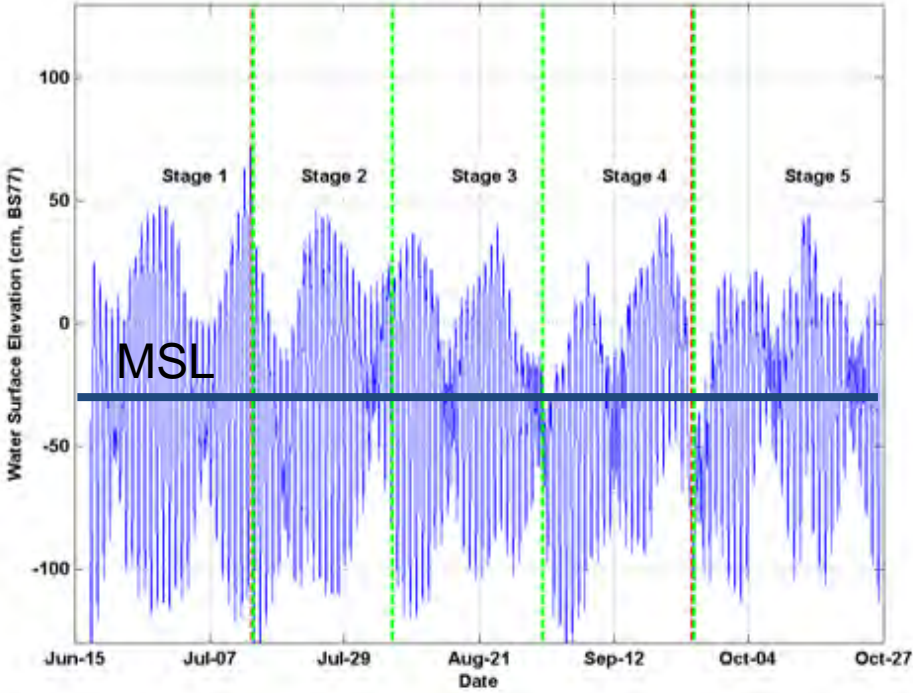
Navigation Water Levels



Entrance



TOF



Hydrodynamic Conditions



Waterway Traffic Constraints

**Determine probability of one-year (2016)
module delivery operation success for the
Odoptu Stage II project**

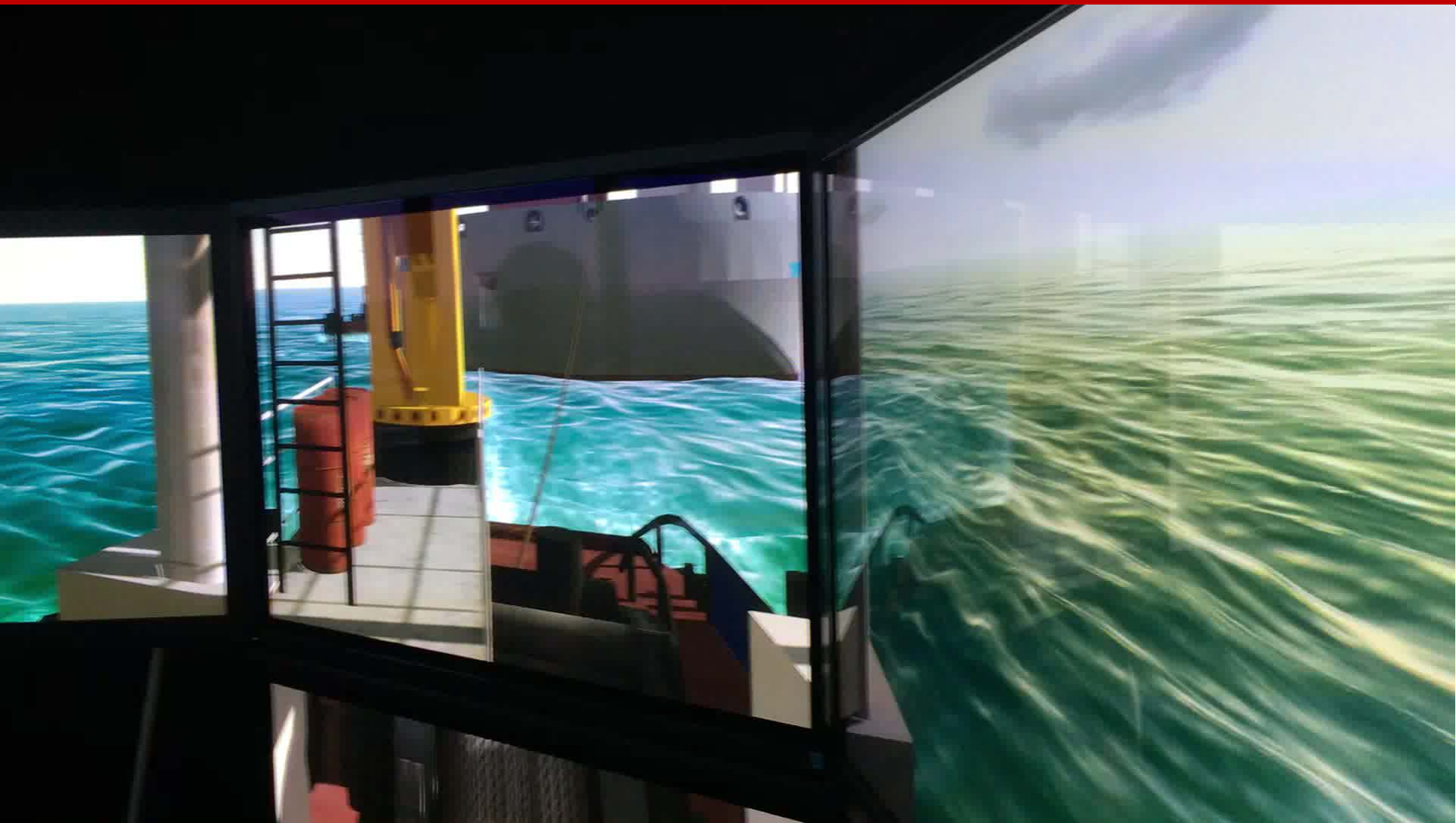
Operability Visualization (x10,000)



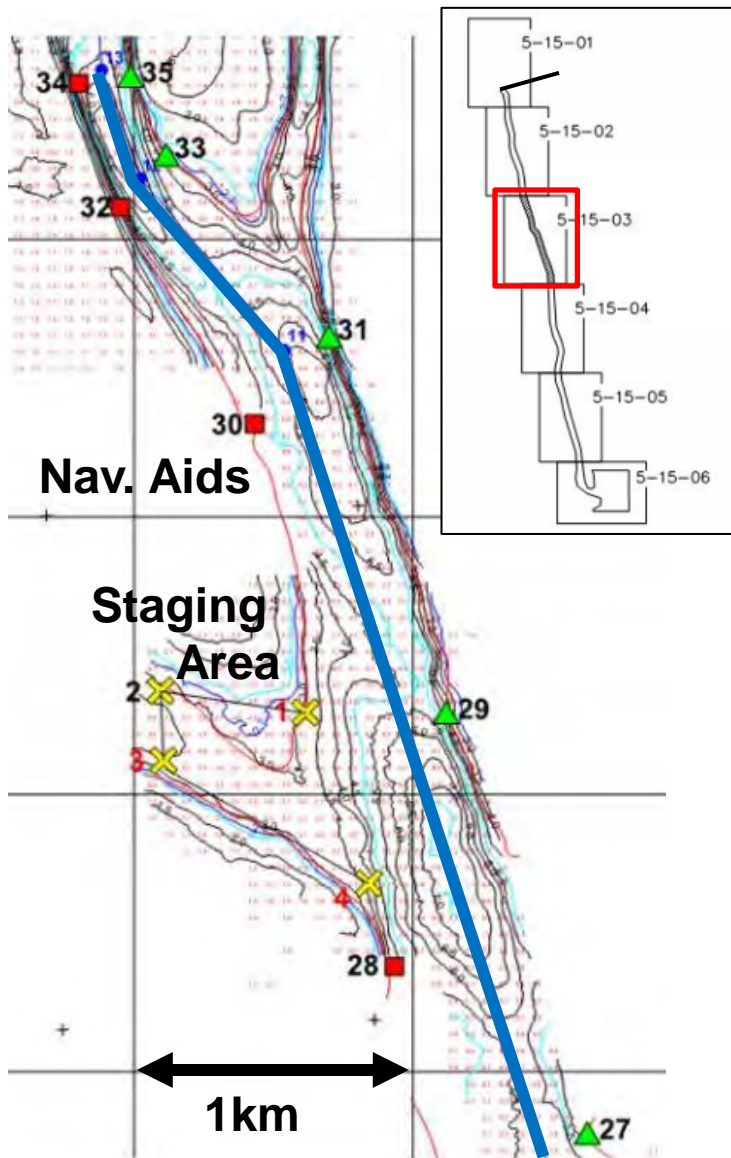
TOF Construction



Full Bridge Simulation



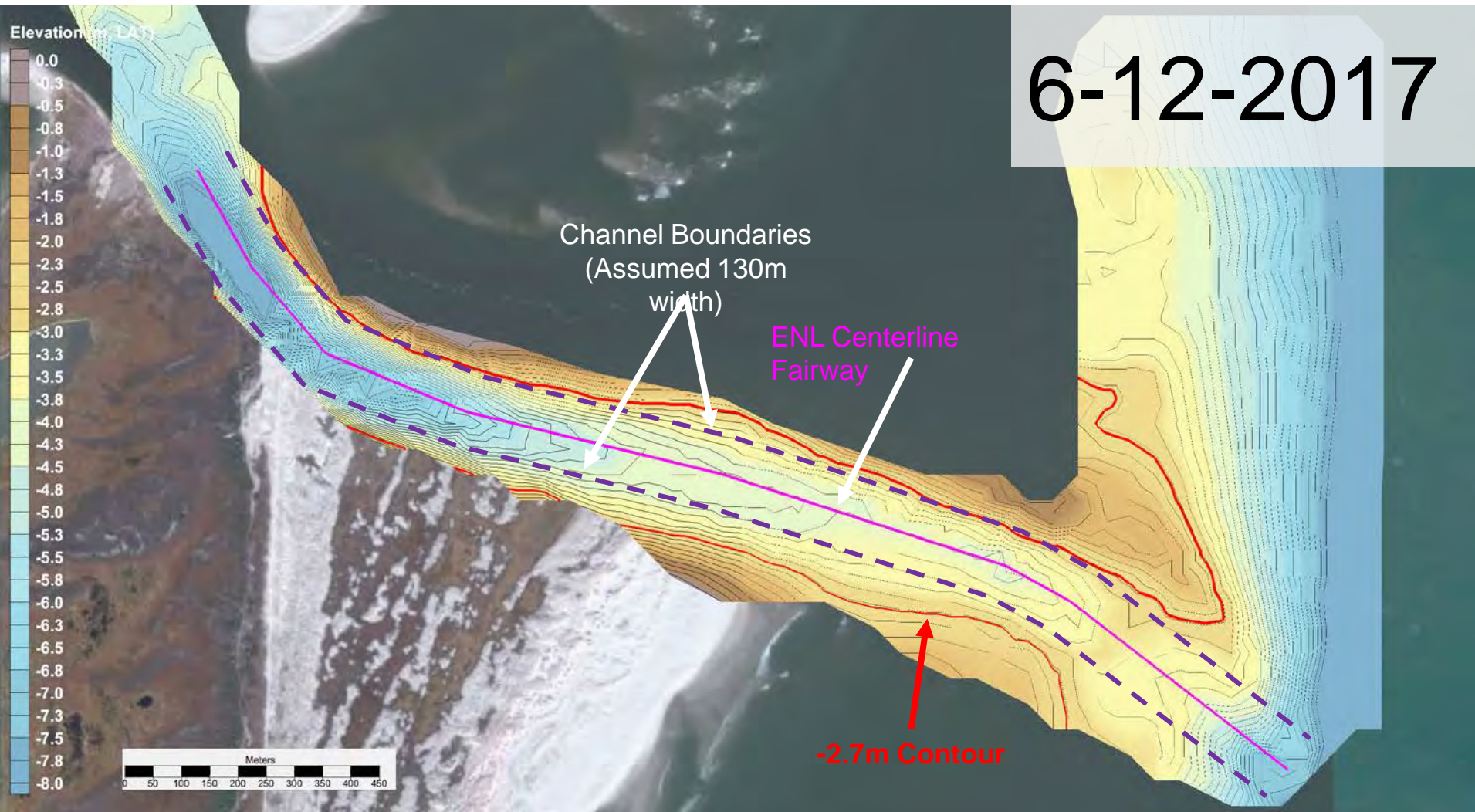
Navigation Design



- **International Guidelines**
 - **Depth**
 - **Width**
- **Russian Regulations**
- **Full Bridge Simulation**
- **Staging Area**
- **No Dredging**
- **Phase with tides (entrance)**
- **2-year process**

Dynamic Waterway: Entrance

6-12-2017



2-Day Process

Natural Waterway



MODULE TRANSPORT OVERLAND – TO INSTALLATION



- Complex site conditions for never-before navigated waterway.
- Properly re-construct physical conditions
- Evaluate risk and communicate risk to owner, and make right decision about schedule
- Development and use of the right engineering tools/models critical to success

Questions?



COAST & HARBOR
ENGINEERING

M
M
MOTT
MACDONALD



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June 5th Ice





Transit of T3706 Across Piltun Bay Entrance