



Foundational Data Priorities



DGGS Coastal Program

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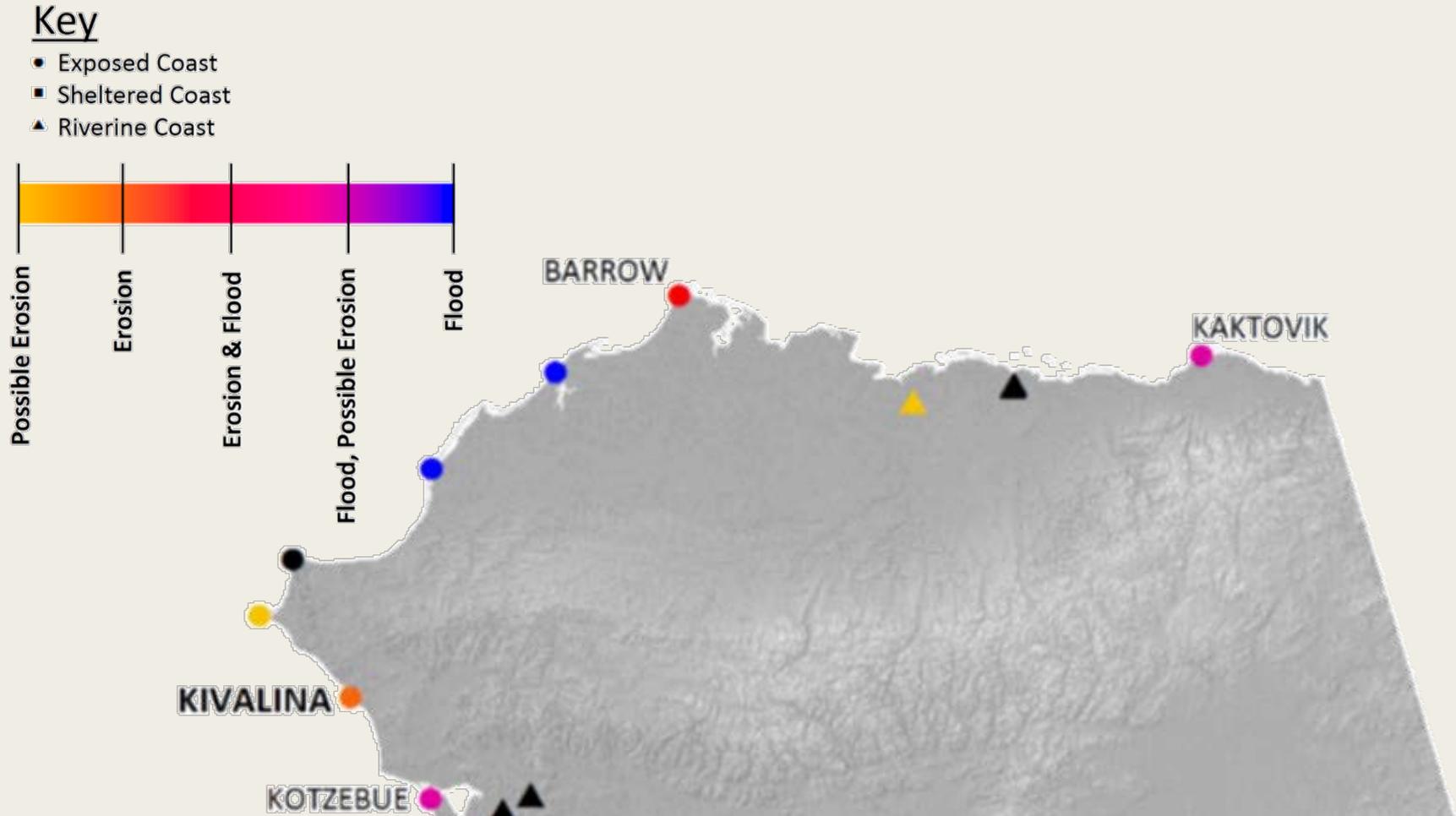
www.dggs.alaska.gov/coast

Coastal Priorities for Arctic LCC

Clarifying Objectives

June 3, 2015

North Slope Locations Vulnerable to Flooding and Erosion



- Alaska ceased participation in the Coastal Zone Management Program in July 2011
- ~12% of AK communities do not participate in the National Flood Insurance Program

Alaska's extensive shorelines are incompletely mapped and under-instrumented to proceed with detailed investigations of coastal processes or widespread assessments of coastal vulnerability

A lack of baseline data is particularly critical in environments that are undergoing long-term change [SHIFTING BASELINES CONCEPT]



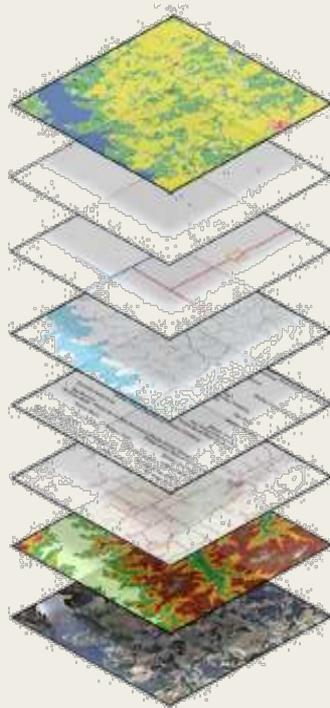
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Decisions are going to be made anyhow.

Despite a lack of baseline data, many of Alaska's coastal communities are involved in mitigation or adaptation efforts in response to natural hazards such as erosion and flooding.

# BUILDING THE FOUNDATION

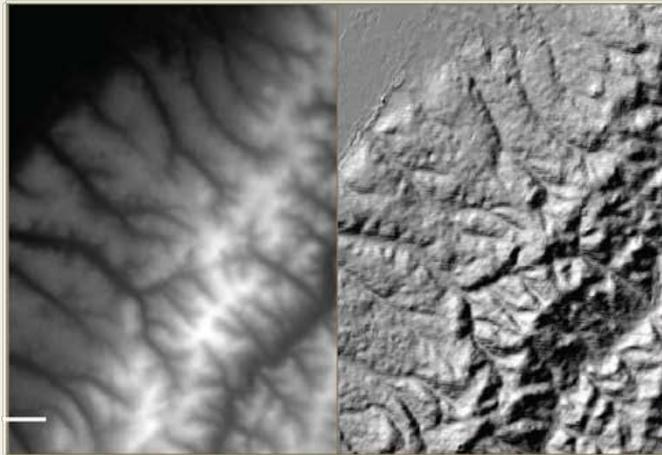
skeletal geospatial data needs for  
coastal flooding and erosion assessments



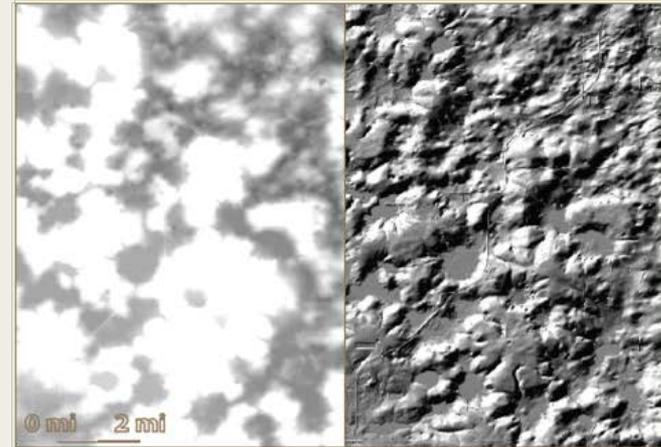
- Digital Elevation Models
- Orthoimagery
- Water levels
- Vertical control
- Land use (risk)

# ALASKA IS DATA LIMITED: Elevation Models - InSAR

Example along the east shore of Norton Sound



Example in Spring Hills, Florida



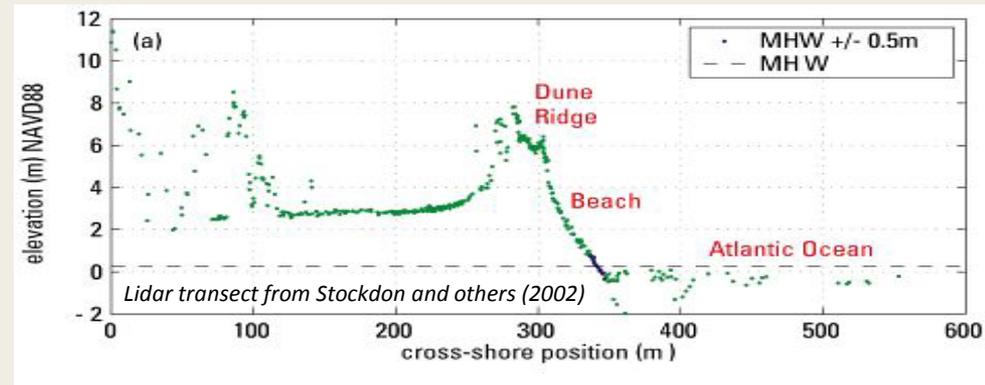
## Alaska - Ifsar Status- 5-Meter Resolution



# ALASKA IS DATA LIMITED: Elevation Models - Lidar



- USGS North Slope Lidar (unclassified, ellipsoid datum, 2009-12)
- NOT topobathy lidar
- Get it (& InSAR) at new DGGS Interactive Elevation Dataset site



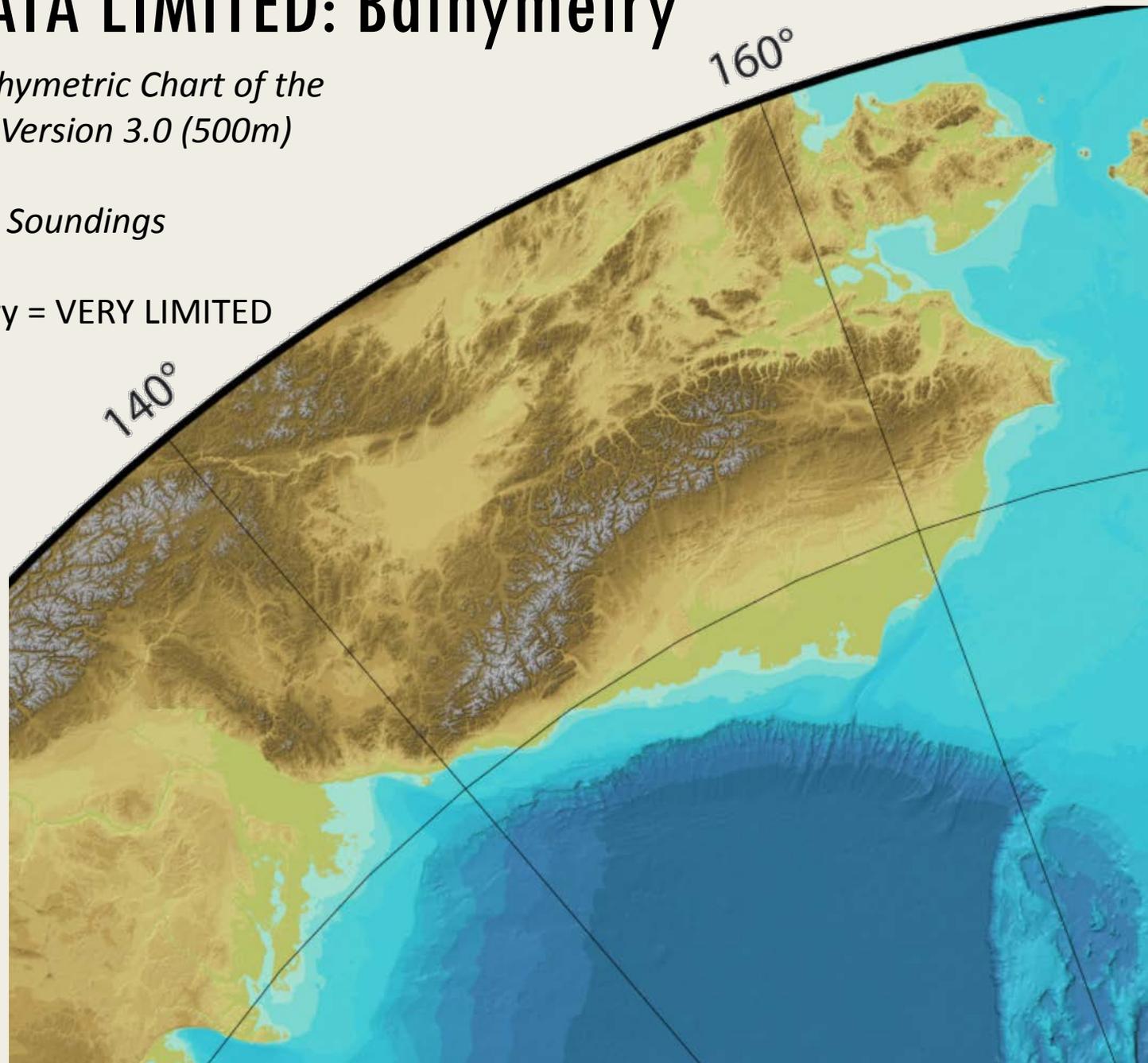
# ALASKA IS DATA LIMITED: Bathymetry

*The International Bathymetric Chart of the Arctic Ocean (IBCAO) Version 3.0 (500m)*

+ NOAA Charting and Soundings

Nearshore bathymetry = VERY LIMITED

[Evaluation of Chart Adequacy over the Arctic North Slope using a Satellite-Derived Bathymetry multi-temporal approach](#) by Pe'eri and others – JCR 2015



# ALASKA IS DATA LIMITED: Orthoimagery

*Example location at Fairbanks  
International Airport*



*SPOT 5*: 2.5 m spatial resolution

1980's AHAPs = orthorectified but not yet publically available

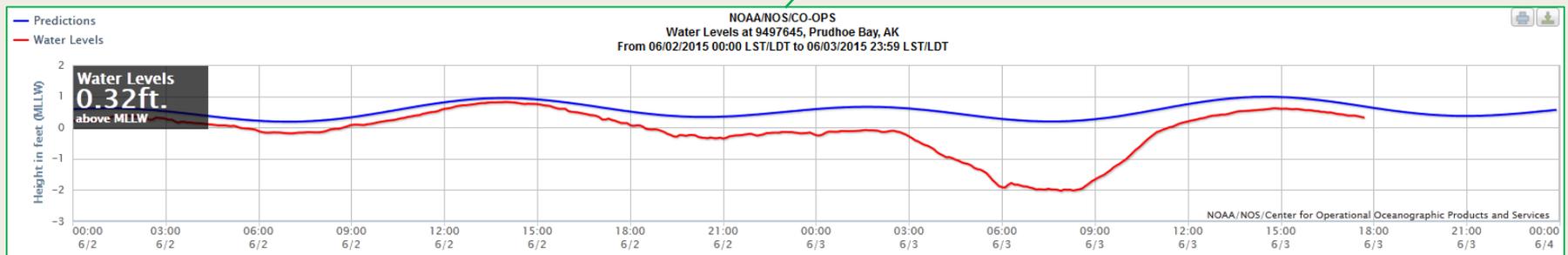
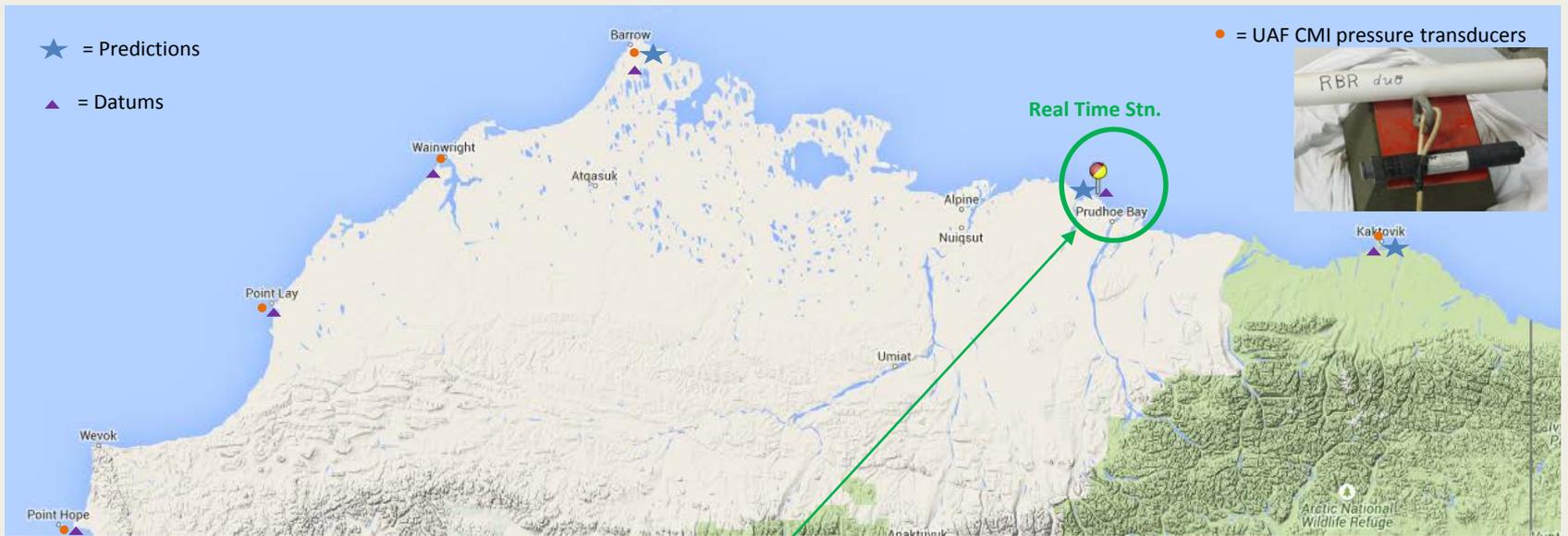
Spot coverage elsewhere. Others?

# ALASKA IS DATA LIMITED: Water Levels (waves too!)

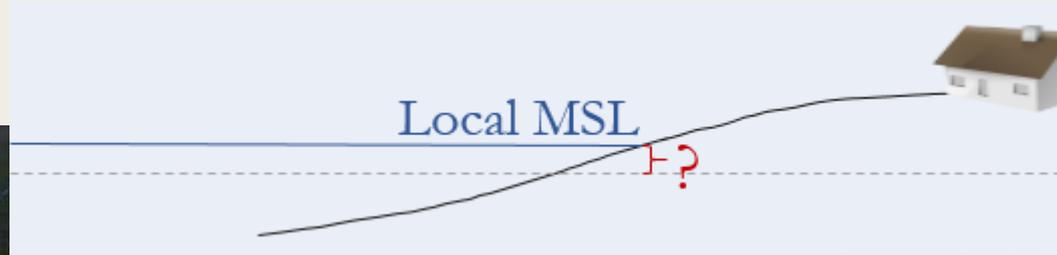
Storm Surge (+ tide, setup, and runup)

[-?] Local MSL

- Storms! Tides! Atmospheric Effects! Sea level trends!



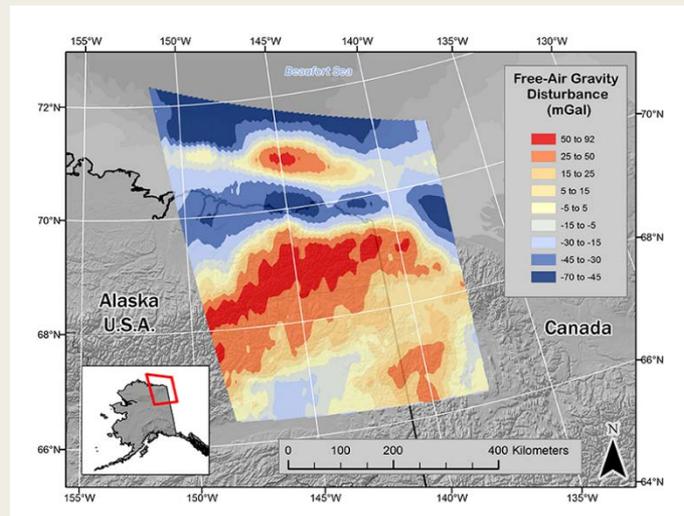
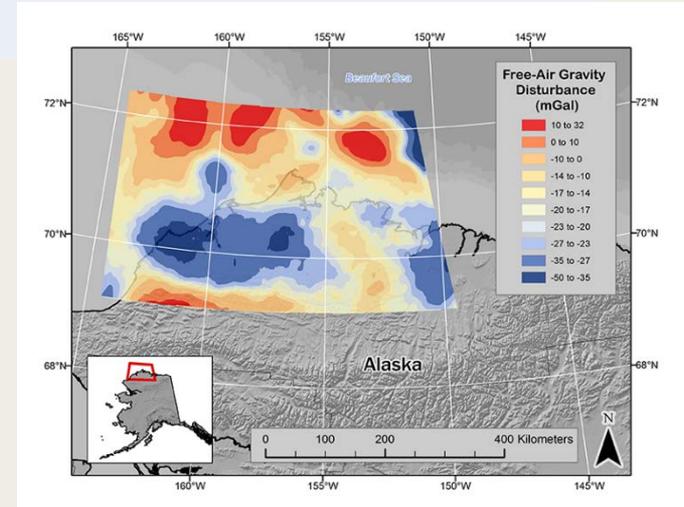
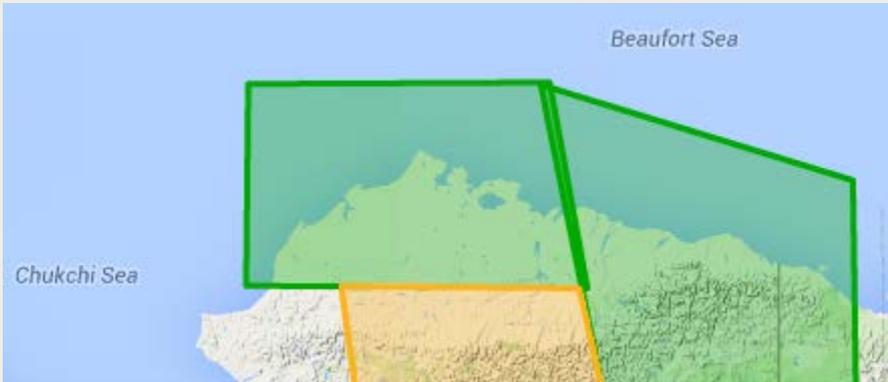
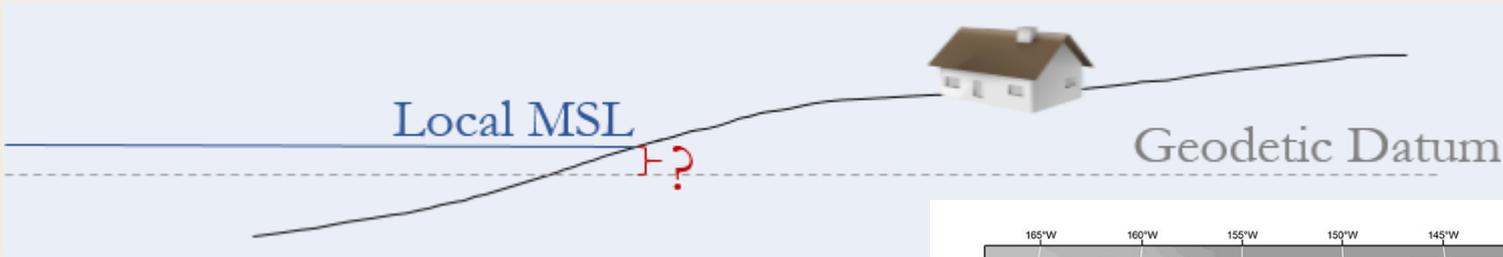
# ALASKA IS DATA LIMITED: Vertical Datums



*Sea of VERTCON  
& VDATUM*

*Alaska*

# ALASKA IS DATA LIMITED: Vertical Control



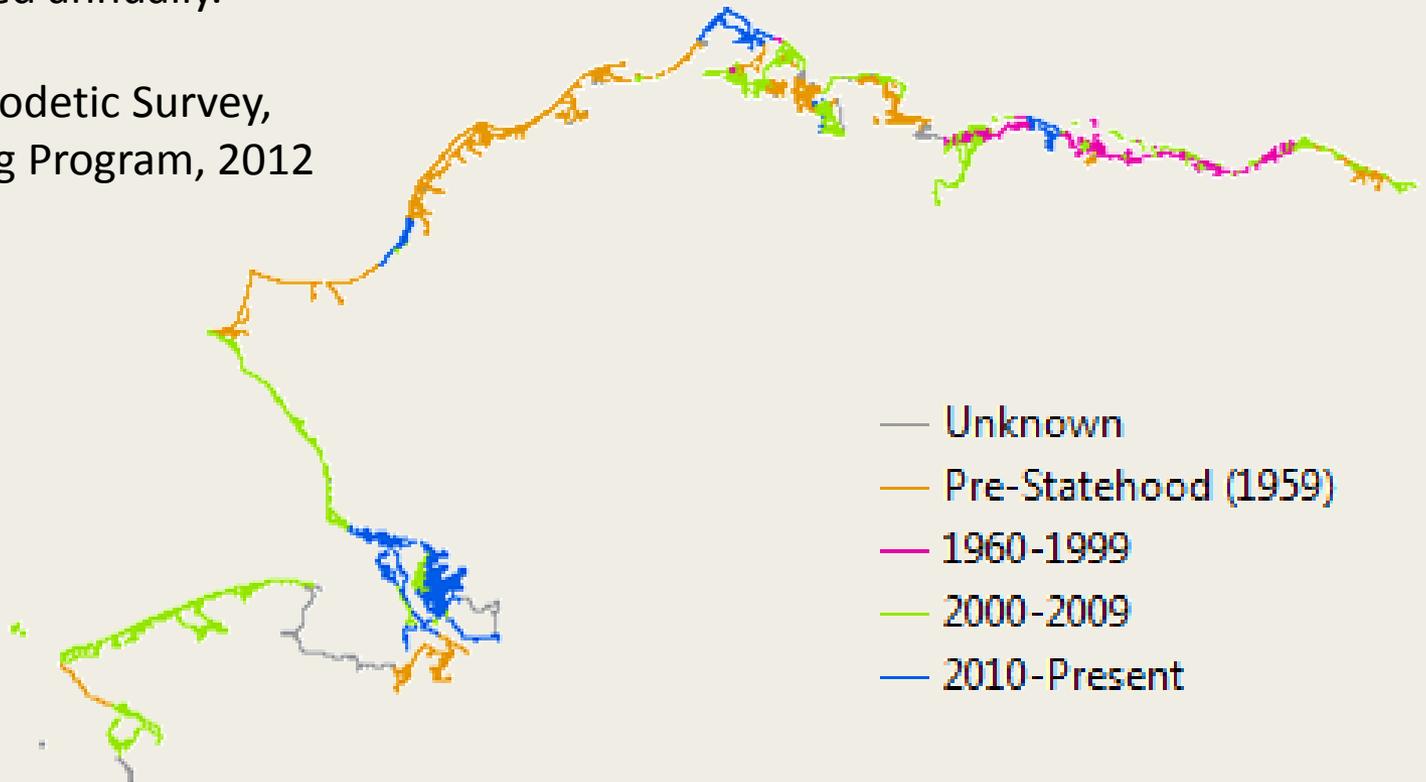
- GRAV-D
- Lisburne Peninsula not yet scheduled
- Improves elevation-sensitive geospatial datasets

# ALASKA IS DATA LIMITED:

## Shoreline Position

“Less than 10% of Alaska has contemporary shoreline data [1960 or newer] and less than 1% is mapped annually.”

– National Geodetic Survey,  
Coastal Mapping Program, 2012



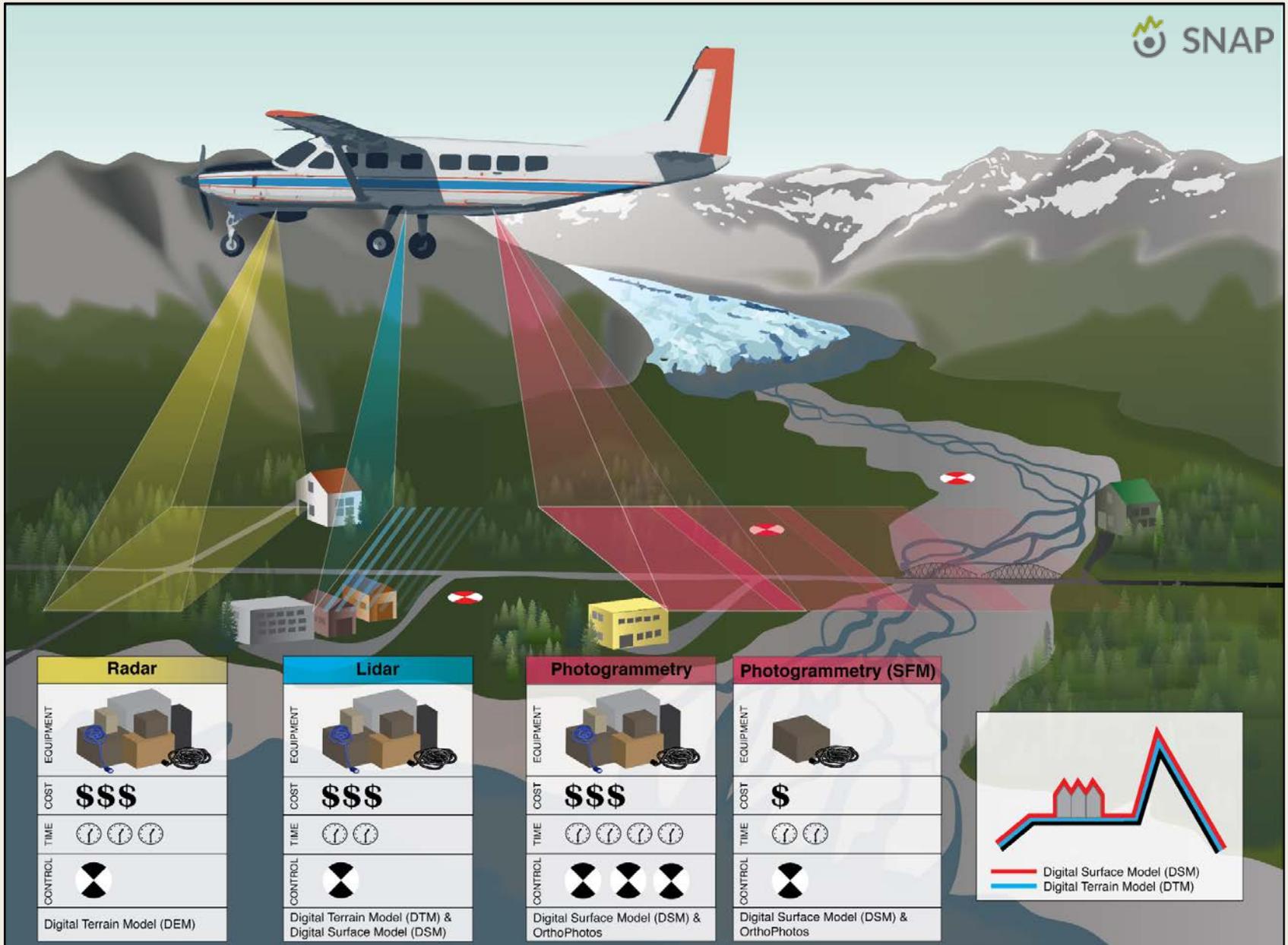
# THANK YOU!

Questions?

Other known data sets? Work underway?



# STRUCTURE FROM MOTION PHOTOGRAMMETRY

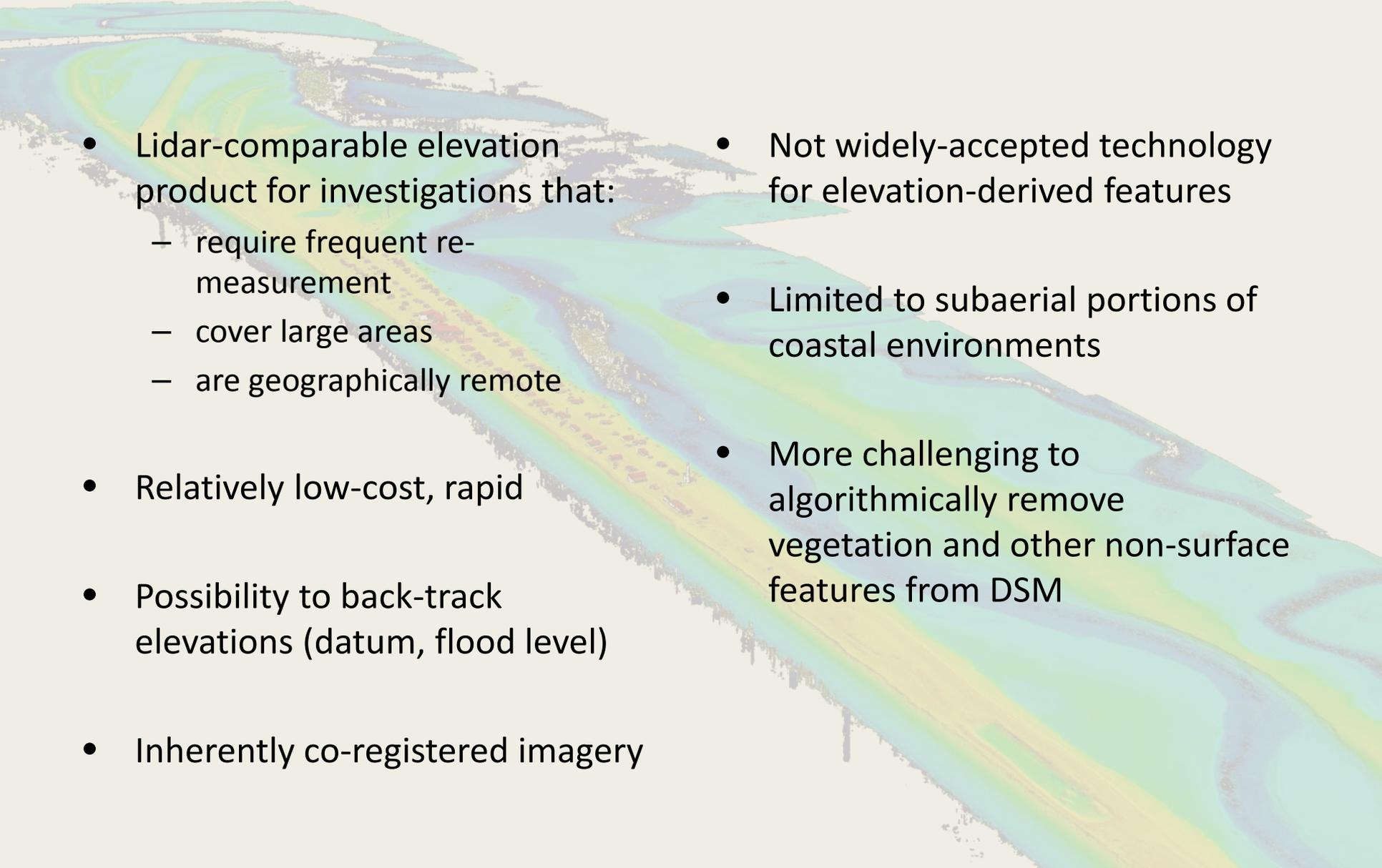


# THE PROS

- Lidar-comparable elevation product for investigations that:
  - require frequent re-measurement
  - cover large areas
  - are geographically remote
- Relatively low-cost, rapid
- Possibility to back-track elevations (datum, flood level)
- Inherently co-registered imagery

# ...AND CONS

- Not widely-accepted technology for elevation-derived features
- Limited to subaerial portions of coastal environments
- More challenging to algorithmically remove vegetation and other non-surface features from DSM



# 2015 PLANS

- Approximately 3,500 km collection
- 1.5 – 5 km swath
- Tide-coordinated
- Independent ground control
- Open-source data products

