

## 2015-2018 Alaska Water Level Retrospective

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## 2015 Alaska Water Level Meeting Recap



May 27-28, 2015

### ~28 participants

### Technologies

- NOAA CO-OPS (McLaughlin/Gill)
- Coastal Tsunami Gauges (Whitmore/Burgy)
- RFC AHPS (Johnson)
- UAF Pressure Sensors (Weingartner/Okonnen)

### Databases

- AOOS (McCammon)
- WALCC (Reynolds)
- USACE (Williams)
- NOAA CO-OPS (McLaughlin)

### Existing Assets/Needs

NWS, NPS, USGS, USACE, UAF, WALCC/FWS, AK DOT&PF, Coastal Frontiers, AOOS, AK DNR/DGGS & Others

Gap Analysis (aka "the SLOG")

• Map of gaps in water level sensor coverage

- Prioritized list of critical sensor assets
- Greater understanding of potential partnerships in the years ahead

## COASTAL & NEARSHORE WATER LEVEL OBSERVATIONS IN ALASKA



Installing a tide gage near Castle Cape, Alapha – June 35, 201 Image Credit: Resonnel of HOAA Shig RAINIER (HOAA's Historic Coast & Geodetic Survey (C&GS) Collection

#### Version 1.0 June 2016

Challenges, Assets, Gaps, and Next Steps

#### A Status Overview

With Meeting Notes from: Explaining Optians for an Integrated Water Level Observation Network in Alaska May 27 - 28, 2015 Ansharaga, Alaska



- Report published June 2016
- Known Users/Applications of WL Data
- Challenges:
  - Technology Gap
  - Barriers to Operation
  - Data Sharing
- Existing Asset Inventory:
  - NWLONS
  - Other Sensors

....R&D ....NWS investment ....AWLW & Partnership

...up UNK, down PML ...infrastructure-based

• 2015 Meeting Summary as Appendix



See published report for complete summary!

## Known Gaps

Geographic Review of Gap Priorities Agency-Specific & Other Priorities

- NWS priorities in western Alaska
- Navigation priorities (met. Forcing areas and in SE Alaska)
- Alaska DOT&PF engineering design requirements



151 46' 41.84" W UTC: 18.43:38 09 Aug 2006 IMG 9289 JPG

# Region 1 of 9: North Slope

- Micro-tidal w/ seasonal landfast sea ice
- Permafrost bluffs & barrier islands
- O&G interests, DoD, BOEM



ShoreZone 2012, near Kivalina

## Region 2 of 9: Northwest/Chukchi

- Increase in open water in the fall/spring seasons
- Low-lying bluffs, rocky headlands, and barrier islands
- Flood and spill response needs, NPS, shipping/barge operations



ShoreZone 2014, St. Lawrence Island

## Region 3 of 9: Bering Strait/Norton

- Shallow & wide shelf = extreme storm surges
- Bluffs, headlands, barrier islands, and estuarine tundra
- Flood and spill response, fisheries and barge operations, possible port development



ShoreZone 2014, west of Bethel



## Region 4 of 9: Kuskokwim Delta

- Highly variable open water season and large coastal storm surges
- Low-lying delta, poorly mapped shoreline
- Flood and oil spill response, salt water inundation, critical habitat changes, coastal engineering, barge operation



### ShoreZone 2006, near Port Heiden

## Region 5 of 9: Bristol Bay

- Meso-tidal (2-4 m range)
- Heavy wave activity and extensive commercial fishing

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- Barrier islands, estuaries, and numerous river mouths
- Critical habitat areas, navigation, flood and spill response, resource development activities, Coast Guard





## Region 6 of 9: Aleutians

- Rocky cliffs and volcanic islands
- Extensive commercial fisheries, increasing vessel traffic
- Oil spill response, navigation, Coast Guard search and rescue operations, seabird/marine mammal rookeries, tsunami risk



- ★ NWLON Station
- ASTRA
- UNAVCO
- 🔺 lgage
- △ Igage Repair (2018)
- Rapid Response (2017)
- Tide Staff
  - Coastal Community or Installation
    - NOAA Operated Station at
- one time (datum should be available)
- # NWLON Gaps (updated 2015)

#### ShoreZone 2009, Kenai Peninsula

## Region 7 of 9: South Central

- Macro-tidal (>4 m tidal ranges)
- Steep bluffs, rocky cliffs, and fjiords
- Continued interest in NPS gauge
   on west side of Cook Inlet
- Recreational use, extensive coastal residential development, O&G infrastructure, advanced ocean modelling research, tsunami risk



ShoreZone 2005, Yakutat

## Region 8 of 9: Port Graham PWS/Lost Coast

- Bluffs, rocky cliffs, and fjiords
- Rapid and complex tectonic
   and isostatic rebound patterns

Palmer

Whittier

Seward Chenega Bay

Anchorage

Valdez

Cordova

6

Cape Yakataga

Yakutat

Tatitlek

Susitna

Nikiski nai <mark>X</mark>Soldotna

Kasilof

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 Navigation, oil spill response, tanker/shipping/cruise routes, NPS, and Forest Service boundary priorities, tsunami risk



## ShoreZone 2006, north of Ketchikan

## Region 9 of 9: Southeast

- Bluffs, rocky cliffs, and fjiords
- Rapid and complex tectonic
   and isostatic rebound patterns
- Documented vessel groundings
- Navigation, flooding and oil spill response, recreation and ecotorism, tsunami risk





## **Alaska Water Level Watch**

## 2015 Recommendations & Progress to Date

- Top Priority Locations
- Ongoing Activities and Leveraging Opportunities
- (Key Recommendations)
- Next Steps



## 2015 Next Steps

- Instrument our Infrastructure
- Rapid Deployment Network
- $\cdot \rightarrow$  Real-Time Fall Storm Predictions/Observations
- Y-K Delta & North Slope Priorities
- Additional NWLON
- Standards Development
- $\cdot \rightarrow$  Digital Directory of Extreme Water Level Events
- $\cdot \rightarrow$  Provisional Tidal Datum Calculation Tool(s)
- R&D for New Sensor Technologies
- Mooring/Buoy Leveling Technique
- WL Gap Analysis by Application



vard Marine Center

**GPS** Antenna

## Additional ETSS Points – Fall Storm Support

## ETSS 2.2

## Experimental P-ETSS 1.1 (beta)



## Digital Directory of Extreme WL Events

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rainfall

### DRAFT Alaska Flood Database





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## Provisional Tidal Datum Calculation Tools

## CO-OPS Tidal Analysis Datum Calculator

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### JOA Online Tidal Datum Computations Tool



#### Online Tidal Datum Computations

Registration Page

Convert your data to information. Upload water level measurements and get tidal datums referenced to the National Tidal Datum Epoch within minutes.

First Name:	Enter First Name:	Last Name:	Enter Last Name:			
Organization:	Organization:					
Phone:	Phone Number:					
Email:	Email Address:					
Password:	Password:					
Confirm:	Confirm Password:					
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eady registered? Sign In here.						

Calculate Datums



## WHAT IS NEXT?

Let's Decide...