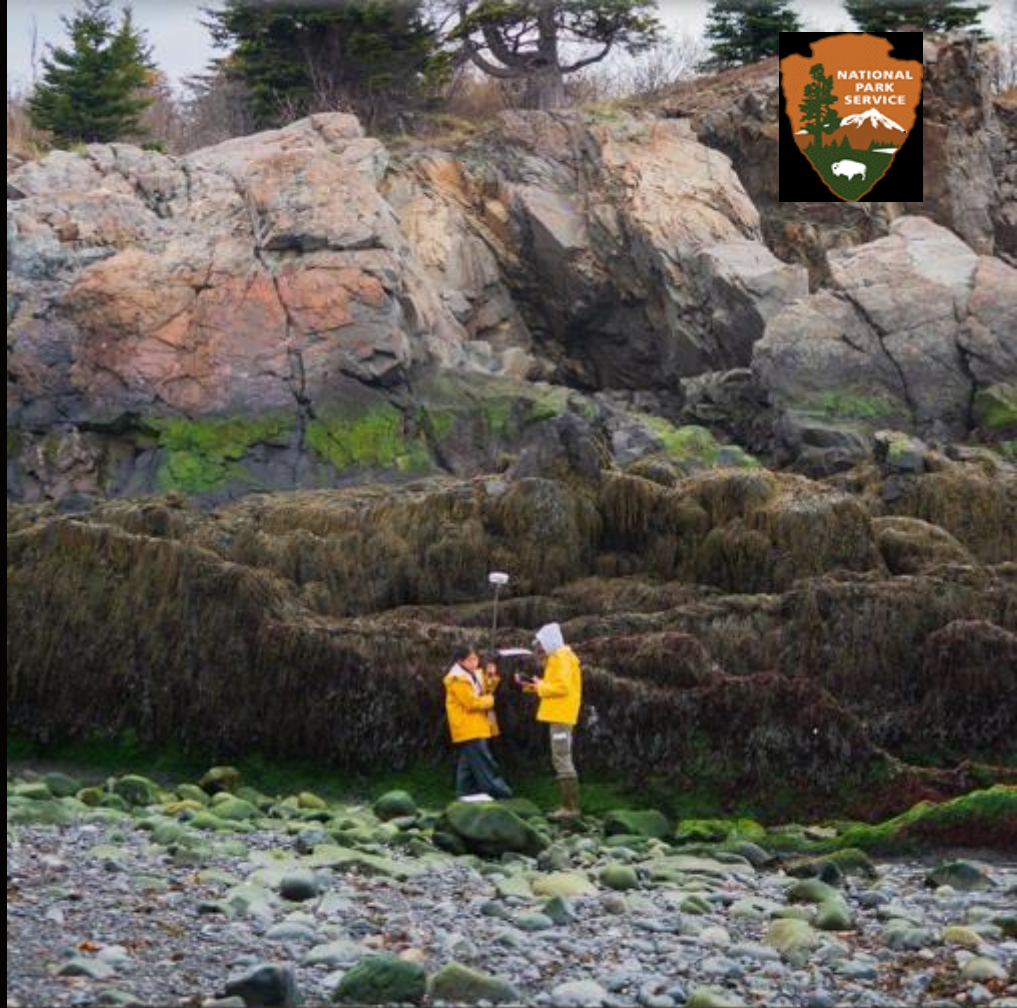


National Park Service
U.S. Department of the Interior
Alaska Regional Office, Anchorage AK

Can “Ologists” Help Put our Coast Lines in the *Right* Place?

Joel Cusick – GIS Specialist
December 10, 2020



Undergraduate researchers Sahana Simonetti and Sophia Ly take precise location and altitude measurements with a sophisticated GPS system. (Tim Briggs)

INTRODUCTION



- GNSS observations provides the backbone of 90% or our field studies along coastal parks
- GNSS provides key ground control in shore line, GCP's and where possible, tidal BM's
- A common reference frame is crucial to tie reference data and long-term monitoring sites together
- GNSS systems have phenomenal precision, but accuracy is dependent on the transformation between legacy geospatial products
- OPUS SHARE to the Rescue

Orthos

LiDAR GPS

UAV

Manned
SfM

GOTO

(Navigation)

GNSS ARE THE PINS IN OUR MAPS



- 2011 NPS compiled over 780 miles of NPS shorelines into NHD using best available NOAA vector & ENC data
- In places along Kenai Fjords 100+ meters of error were fixed and marine chart discrepancies reported when found
- Not possible without boots-on-ground GPS observations and aerial Orthos (airborne GNSS)

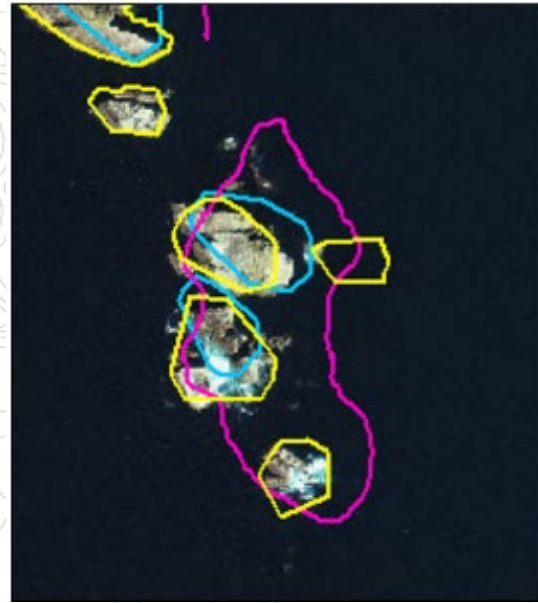


Figure 38. Pye Islands: Variation between National Map NHD data (blue), NOAA EVS data (pink) NOAA ENC data (yellow)

GNSS VITAL FOR CHANGE



National Parks “Ideal” Scenario

1. Establish and manage a network of backbone vertical control points in each park.
2. Establish and manage sentinel sites at or near locations of interest and/or importance in each park.
3. Ensure all backbone points and sentinel sites have highly accurate elevation data with an ellipsoid, orthometric, and tidal datum heights.

Link [Coastal Elevations in National Parks](#)

ALASKA PARKS ARE REMOTE



- NPS personnel work in some of the most remote corners of Alaska some of which have tidal mark priorities and vastly outdated digital representations of MHW.
- The boundary question along marine fronted parks is the most common question for park managers.
- How can NPS personnel provide support in both 2 and 3 dimensional mapping efforts that will *LAST!*

National Park System in Alaska

Alaska Region
National Park Service
U.S. Department of the Interior



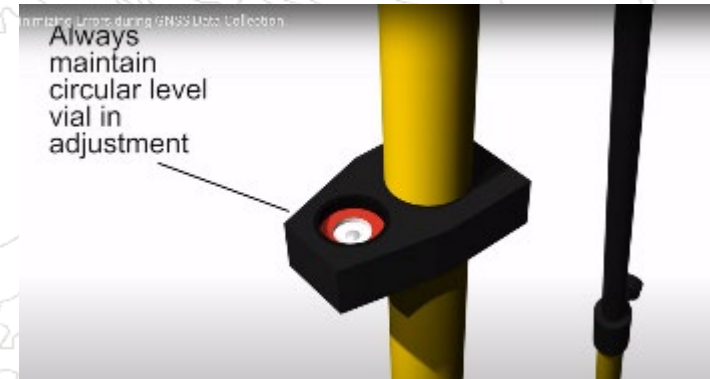
CAN THE OLOGIST BE A SURVEYOR?



NO! But they can RECOVER, OBSERVE,
REPORT

- Ologists are used to calibrating and controls
- Ologists are well practiced in taking notes, documenting with photos
- But many are not schooled in surveying techniques nor is this part of their Job Description

Job Description...Must be able to use GPS



LESSONS LEARNED



- Communicate and find where science is happening (Scientists keep to themselves)
- Practice on easy ground first
- Point them to online NGS training



LESSONS LEARNED cont.



- Teach scientists dual-frequency static observation techniques
- Leverage existing control as much as possible
- Teach scientists to use a hatchet!
- Key is to observe as long as possible (Over one tidal cycle 8 hours or more)
- *This mark failed after 7 hrs. w/ just 67% obs used

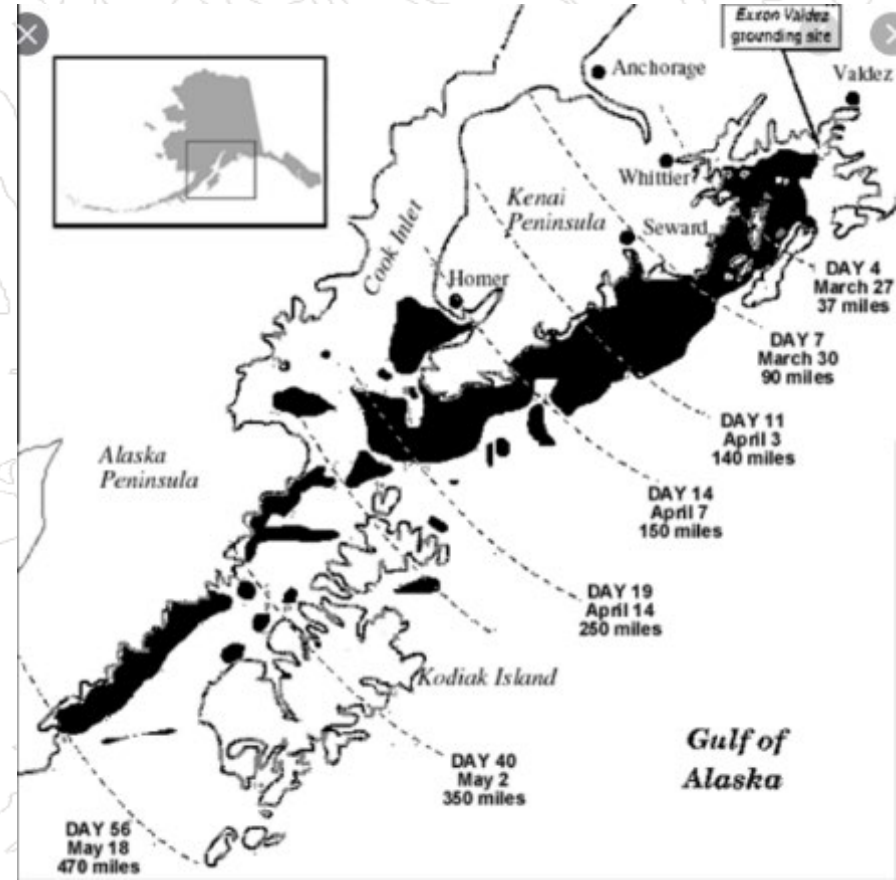
Paguna Tidal mark Observation rejected by OPUS



ALASKAN-SIZED CHALLENGES



- Alaska still remains “off the chart” in terms of charting, and shorelines
- Majority of Katmai (480 miles) remains in ca 1930’s (pre GPS) vintage shoreline
- NPS has +/- 2 meter CIR Orthos that could be used by NOAA to update shoreline
- **Reminder** : Shelikof Straits sees hi vessel traffic and was hammered by Exxon Valdez spill. PREPARE!

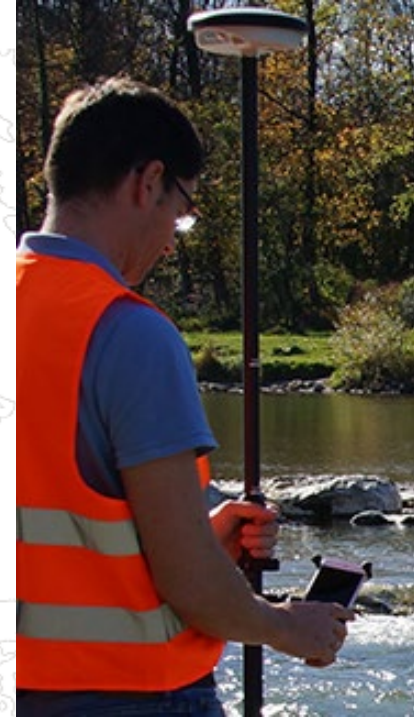


FUTURE IS BRIGHT -



- Leica GG04 Dual Frequency Smart Antennas
- An inexpensive entry point for ologists to observe and **submit OPUS Shared solutions** anywhere, anytime
- Cheat sheets, training and deployment efforts are underway to ensure our scientists can provide coordinates for the future.

**NPS jumps into
Dual Frequency**



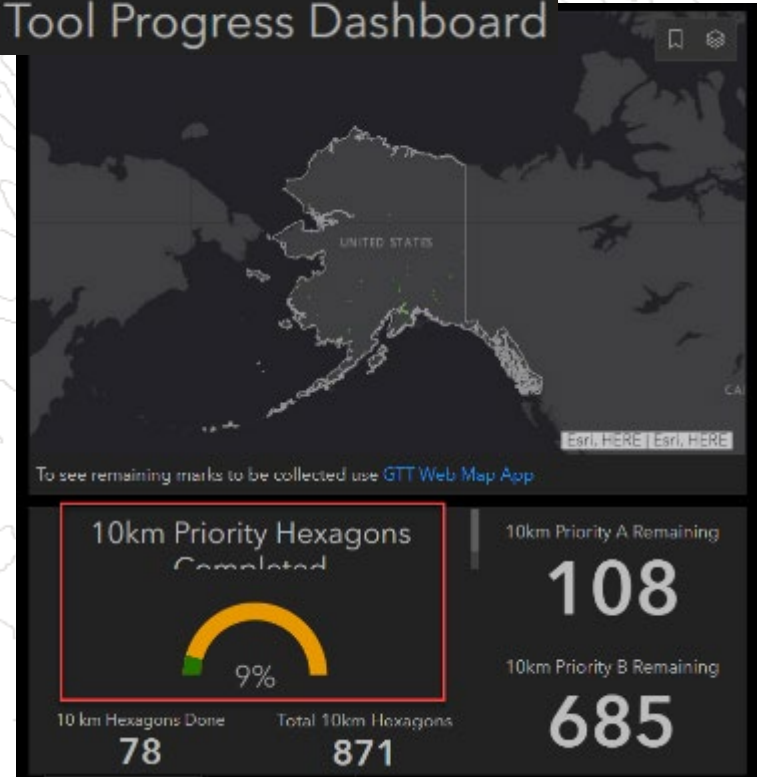
SUMMARY



GPS on Bench Marks for the Transformation Tool Progress Dashboard

- This coming summer is a critical time to submit OPUS shared observations anywhere in Alaska
- Spread the word, Spread the gear, and Spread the training
- Help improve access to the NSRS by updating to contemporary mark coordinates

[GPS On Benchmarks – Links to Priority Recoveries and Dashboard](#)





Links

Links to relevant original authoritative data are provided below:

[iGAGE Videos](#) on Surveying Topics and the Best [OPUS Practices for New and Experienced Users section on the iG9 manual here](#) – near end of document.

[iGAGE write up – Which Tripod Should I use for Static Observations](#)

[Coastal Elevations in National Parks](#)

[GPS On Benchmarks – Links to Priority Recoveries and Dashboard](#)

[DGGS Alaska Tidal Datum Portal](#)

[Center for Operational Oceanographic Products and Services \(CO-OPS\) established tidal datums in Alaska](#)

[Online Positioning User Service \(OPUS\) Shared Solutions](#)

[Benchmark Recovery Form ONLINE](#)

Thank You

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National Park Service
U.S. Department of the Interior