

Alaska Geospatial Council
Geodetic
Technical Working Group (TWG)
Co-Chairs:



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New Frontiers in Geodetic Control: Positioning Alaska for our Future

Alaska Geospatial Council GIS Day Celebration November 14, 2022 9:30 AK
Nic Kinsman, NOAA National Geodetic Survey

A photograph of a geodetic surveying instrument on a tripod in a landscape with mountains and a lake. The instrument is in the foreground, and the background shows a vast, open landscape with green hills and a blue lake under a clear sky.

Geodetic Technical Working Group

Precisely aligning all of Alaska

Enabling consistent use of latitudes, longitudes, and heights in Alaska

Optimal use of geospatial data requires a shared positioning framework that promotes data integrity and accuracy, maximizes the useful lifespans of map products, and reduces data collection and management costs.

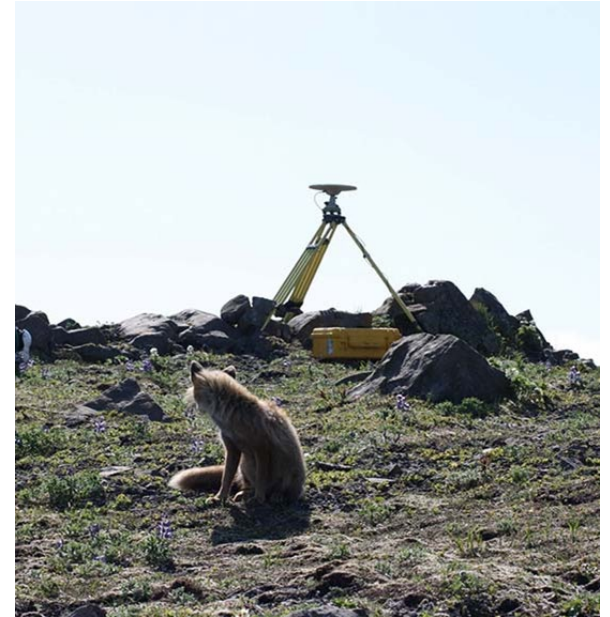
Geodesy: What and Why?

Geodesy is the the **science of defining positions in space, time, and relative to other locations on earth.**

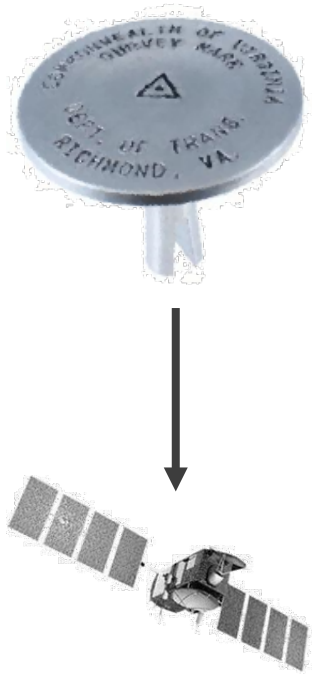
With informed use of:

- reference frames,
- datums,
- transformation tools,
- metadata, and
- GNSS positioning,

Alaska's geodetic framework **promotes exchange and use of geospatial data investments** by ensuring interoperability and alignment of data from many different sources.



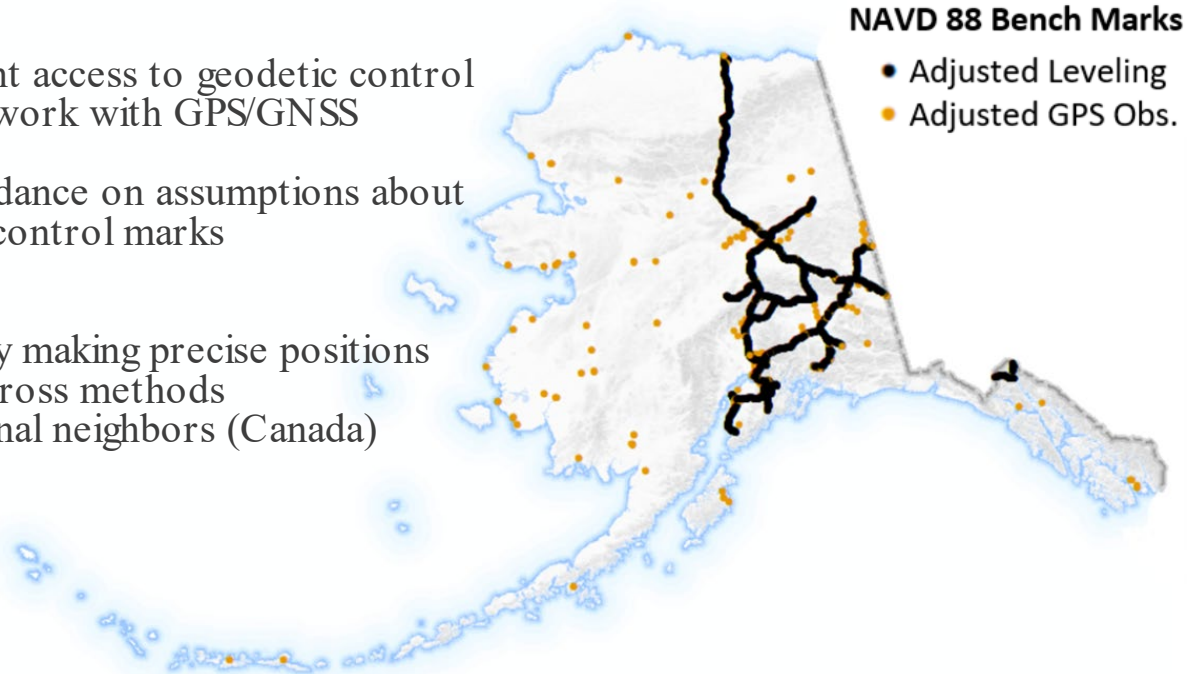
National Spatial Reference System Modernization



- NOAA's National Geodetic Survey will replace:
 - NAD 83 → North American Terrestrial Reference Frame of 2022 (NATRF2022)
 - NAVD 88 → North American-Pacific Geopotential Datum of 2022 (NAPGD2022)
- New reference system is:
 - Time-dependent and geocentric
 - Defined by relationships to a global/international ideal frame
 - Primarily accessed via GNSS and a newly refined gravimetric geoid model
- Activity underway to support Alaska:
 - GRAV-D → airborne gravity surveys for geoid refinement
 - Foundation CORS Program
 - 'GPS on Benchmarks' to support Transformation Tools (inc. VDatum)
 - State Plane Coordinate System - 2022 Redesign

NSRS Modernization : A Boon to Alaska

- **Access:** expands convenient access to geodetic control beyond passive control network with GPS/GNSS
- **Reliability :** reduces dependance on assumptions about the fixed nature of passive control marks
- **Consistency :**
 - Enhances alignment by making precise positions more reproducible across methods
 - Aligns with international neighbors (Canada)



Geodetic TWG Mission

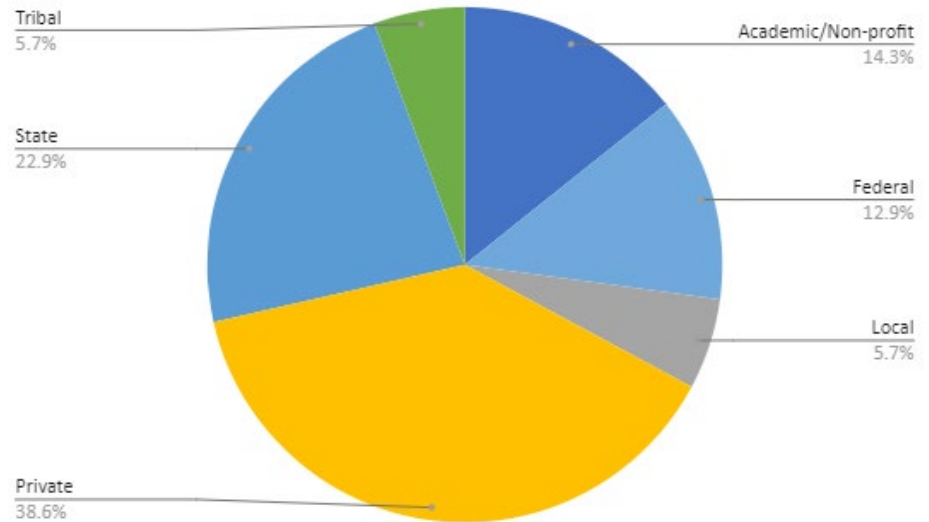


To enhance and ensure access to Alaska's geodetic control networks, and to support statewide precise positioning with consistent practices appropriate to a range of applications.

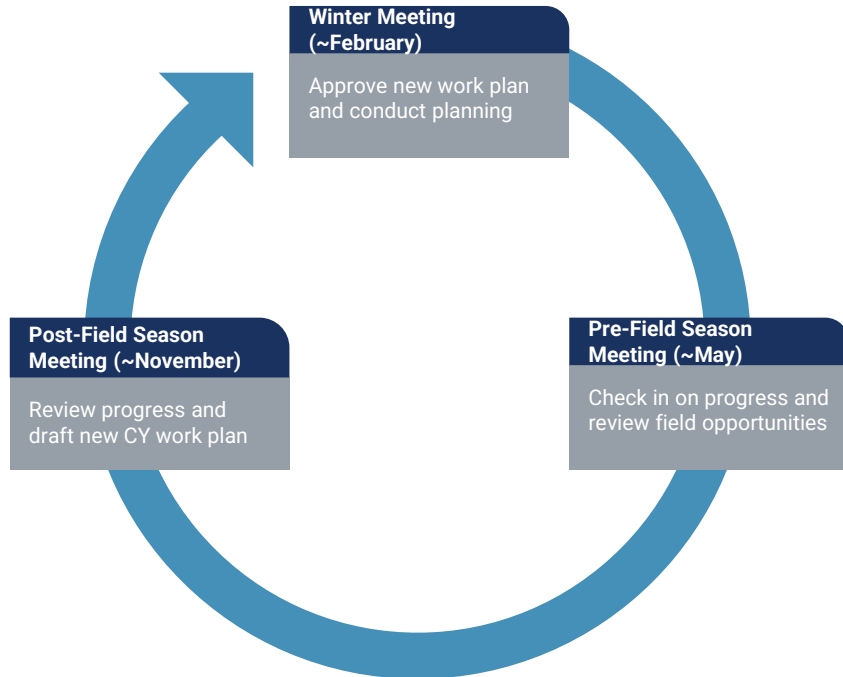
Geodetic TWG Membership

- Membership growth since 2021, with greatest gains in tribal and local govt.
- Federal involvement includes:
 - NOAA
 - USACE
 - BLM
 - Forest Service
 - NPS

Count by Sector - 70 Active Members



Geodetic TWG Annual Work Plan Process



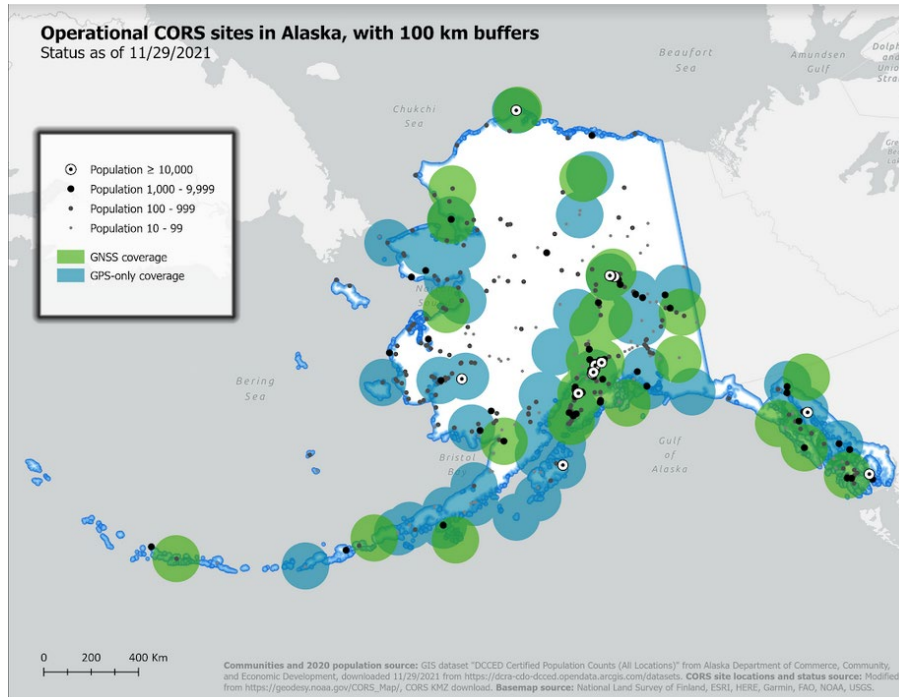
- Met on November 9 (last week)
- Full membership meets 3 times/year:
 - Feature relevant guest speakers
 - Exchange knowledge / developments
 - Share announcements / new events
 - Submit regular TWG updates to AGC
- Annual work plan focuses on actionable, in-kind efforts
 - Short term goals: within year
 - Long term goals: beyond year

Geodetic TWG Focus Areas

- Continuously Operating Reference Stations
- Real Time Networks
- Geodetic Training (Metadata Best Practices)
- Projections and Transformations
- Vertical Datums - Tidal and Geopotential



Focus Area Accomplishments: Continuously Operating Reference Stations



Alaska CORS coverage; figure courtesy of Frances Biles, US Forest Service

Short Term Goals:

- Establishment of new cGNSS sites
- New Foundation CORS sites
- cGNSS co-located with tide stations
- Join Alaska Coastal and Ocean Mapping Summit later this week for more details

Long Term Goals:

- Complete statewide coverage at 100 km soacting by partner stations in NOAA CORS Network

Focus Area Accomplishments: Real Time Networks

Full Presentations Upcoming!

Alaska's Continuously Operating Reference Network (ACORN)

- Presenter: Peter Flint, Alaska DNR
- One year of progress to share
- Collaboration between DNR, DOT&PF, NPS, and others

Centimeter Precision via NTRIP Stations in Alaska

- Presenter: Joel Cusick, NPS Alaska
- NPS installation of 15 GNSS base stations in NPS parks and USFWS refuges
- Collaboration with UAF Geophysical Institute

Focus Area Accomplishments: Geodetic Training (Metadata Best Practices)



ASPLS-HLSA VIRTUAL SURVEY CONFERENCE

April 28 - 30, 2022

Alaska and Hawaii Virtual Survey Conference

NOAA's National Geodetic Survey Positioning America for the Future geodesy.noaa.gov

GeMS Validation Survey (GeMS-VS)

Outline:

- GeMS Overview
- Why Alaska for this type of work (GeMS-VS)?
- Geodetic observational techniques
- Challenges
- Preliminary results

May 2022 Webinar on GeMS Validation Survey



ASPLS Chapters Holding Joint Monthly Meetings

Long Term Goal:

Alaska geospatial professionals have ready access to resources on best practices

Focus Area Accomplishments: Projections and Transformations

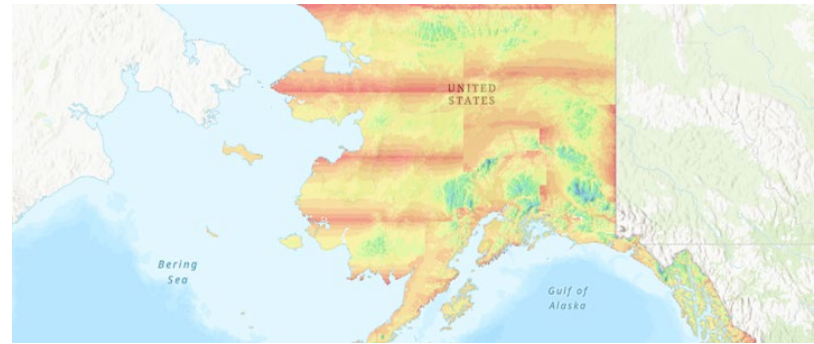
Alaska Statute 38.20 Amendment



HB 148 Bill Signing Ceremony August 9, 2022

- An Act relating to the Alaska Coordinate System of 2022
- Effective November 7, 2022
- Cites NOAA, NGS as authority for maintaining coordinate system parameters; defines past utilization of the US Survey foot and forward use of meters and international feet

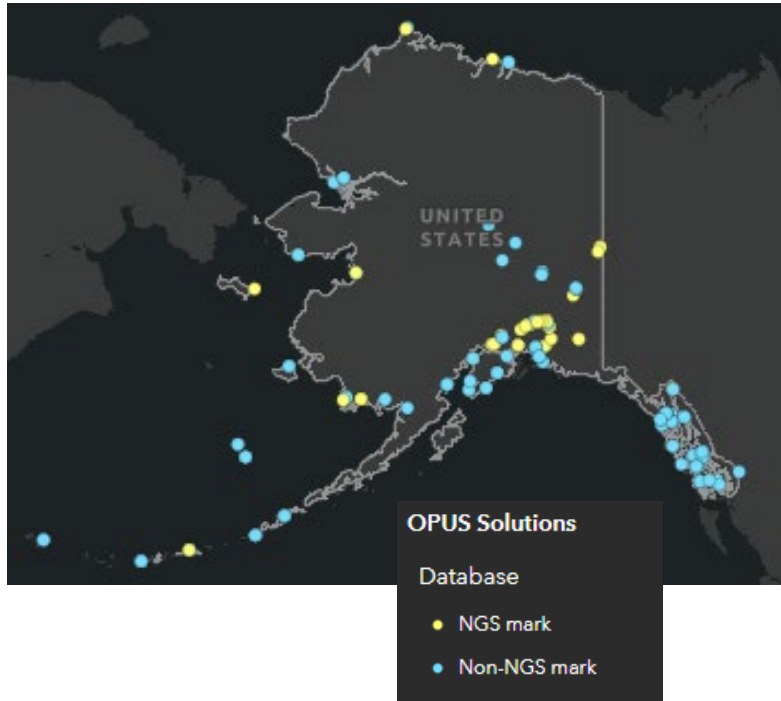
Alaska State Plane Coordinate System of 2022



New public Alaska SPCS2022 Layer 2 distortion map on AGC Hub Site

- Alaska's SPCS2022 proposal consists of 3 layers and was submitted Spring 2020
- Alaska SPCS2022 partial coverage Layer 3 design provisionally approved November 4
- As of last week, maps of intended zone use extents and distortion at ground are online

Focus Area Accomplishments: Vertical Datums - Tidal and Geopotential



Accomplishments

- 189 OPUS Shares thus far in 2022

Top 'sharers':

- JOA Surveys
 - eTrac
 - NOAA & NPS
 - Windy Creek Surveys
 - Global Positioning Services Inc.
 - R&M Consultants Inc.
 - Woolpert Inc.
-
- 14/40 critical tidal datums established for statewide VDatum
 - Join Alaska Coastal and Ocean Mapping Summit for more!



Thank you!