



Coastal Data and Information Systems for Resilience

March 3, 2021

The National Spatial Reference System's Role in Resilience

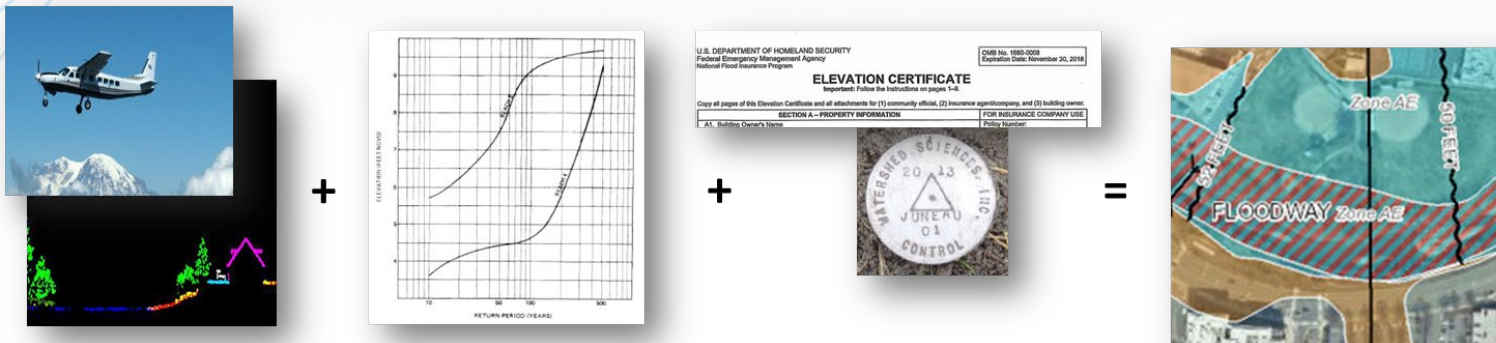


Nicole Kinsman, PhD
Alaska Regional Advisor
NOAA National Geodetic Survey

A **common** and **consistent** geospatial framework to meet the economic, social, and environmental positioning needs of our Nation.

Foundational elements include:

Latitude • Longitude • Elevation •
Gravity • Shoreline Position
+ changes over time



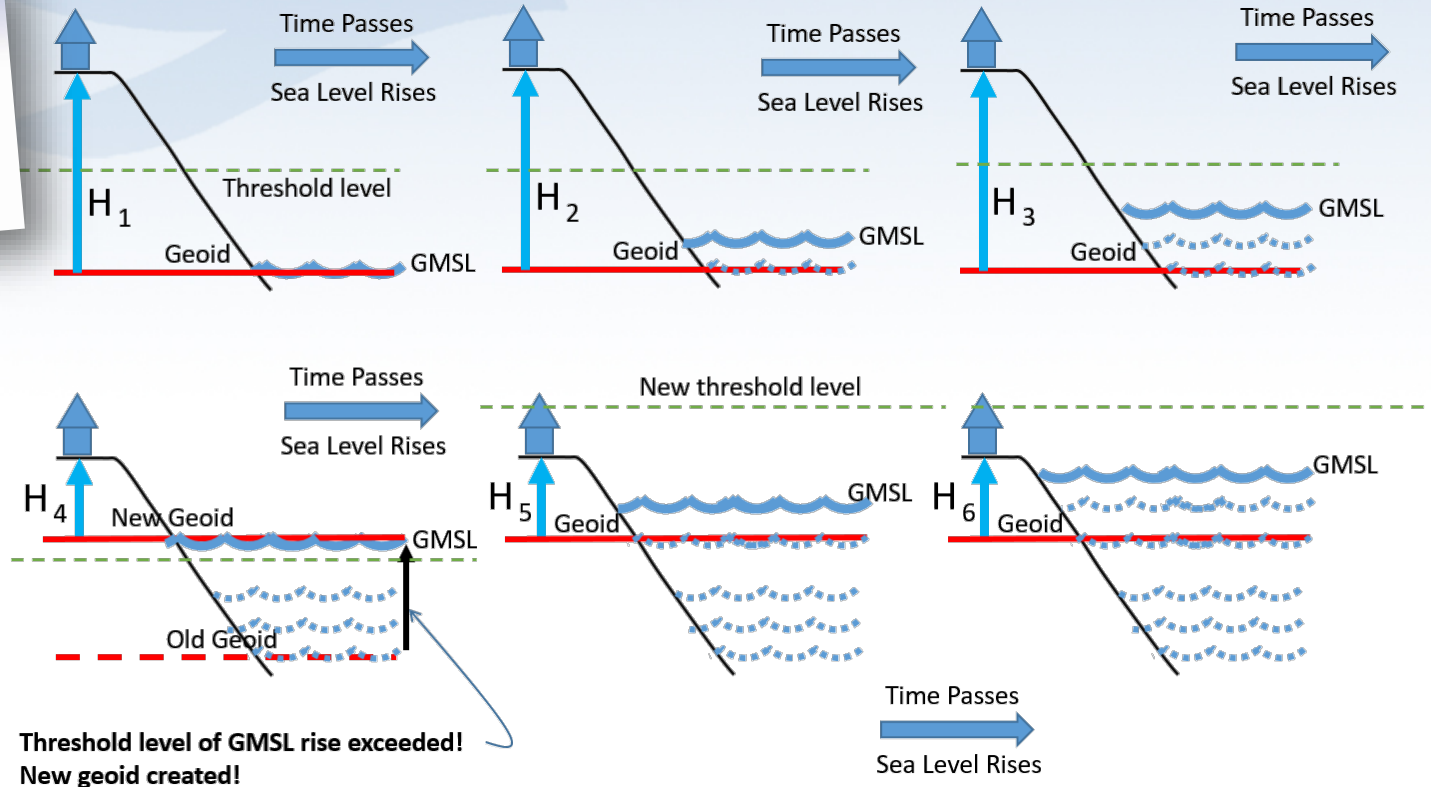
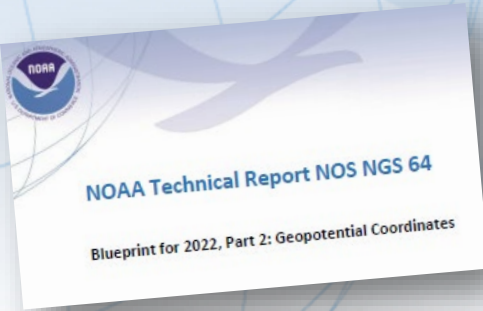
Reliable FIRMs require data from disparate sources and dates be consistently aligned

GNSS-based Access to the Modernized NSRS



- **CORSs** (Foundation + NCN) defines frames and maintain relationship with ITRS
- **GRAV-D** → Gravimetric Geoid provides access to the geopotential datum (heights)

Migrating the geoid as GMSL changes



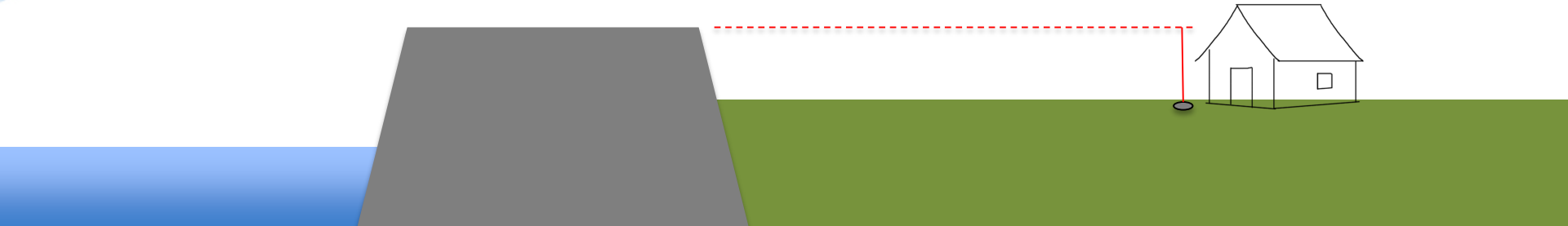
defines frames
and maintain
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ITRS



2018 Coastal Flooding - Kotzebue, Alaska (*Jacquelyn Overbeck/Alaska DGGs*)

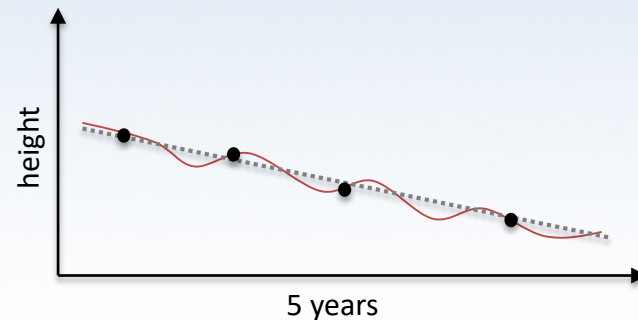
Time-Dependent Coordinates

- **Reference Epoch Coordinates**
'stable' at project scales (5-10 years)

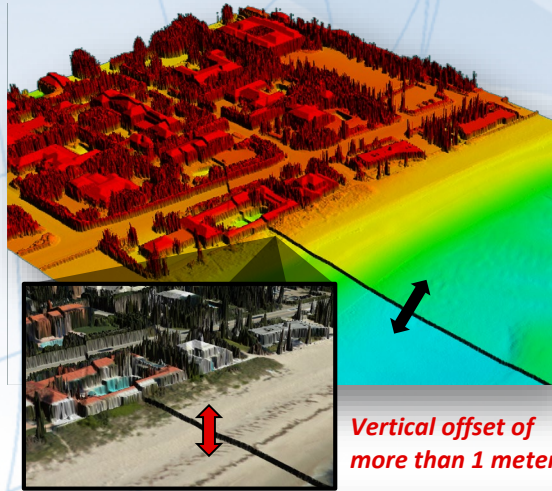


Time-Dependent Coordinates

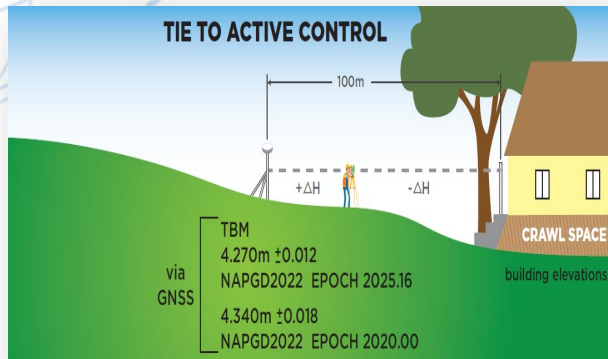
- **Reference Epoch Coordinates**
'stable' at project scales (5-10 years)
- **Survey Epoch Coordinates**
reflective of narrow window in time
- **Coordinate Function** (at CORS)



NGS Use Cases: Transitioning Data, Flood Mapping



- **Transitioning** from NAVD 88 to NAPGD2022
- **Empowering professionals** with enhanced tools for existing FEMA National Flood Insurance Program (NFIP) and other inundation workflows:
 - Elevation Certificate surveys
 - Transformation of data by FEMA Mapping Partners
- Improve hydraulic modeling with **gravimetric geoid**
- **Fully leveraging modernized NSRS** in coastal applications or a Coastal Data Information System



Modernized NSRS Opportunities

With:

- **Foundation CORS** in place,
- **GRAV-D** completed, and
- a modernized NSRS that is supported by user-friendly processing, visualization, and transformation tools like **VDatum**

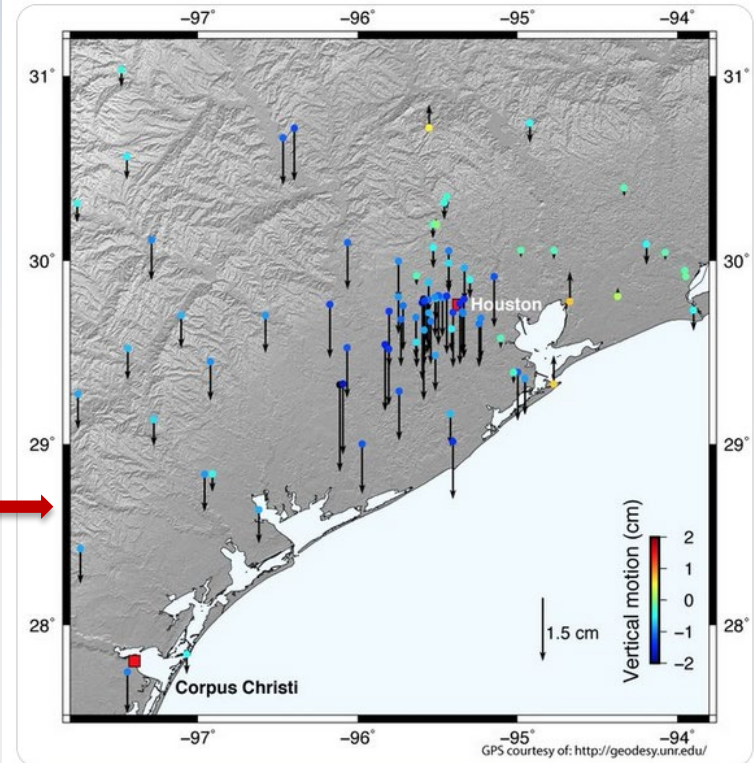
Imagine:

- *Operationalizing this type of analysis at different timescale nationwide to support detailed vertical land models*
- *Validating IfSAR-based land deformation products and coastal decision support tools*



Dr. Chris Milliner
@Geo_GIF

GPS data show #Harveyflood was so large it flexed Earth's crust, pushing #Houston down by ~2 cm!
#EarthScience #HurricaneHarvey #txflood





November 2011 Coastal Flooding - Golovin, Alaska (*Toby Anungazuk*)

Recommendations

- Advance NSRS Modernization projects (**Foundation CORS, GRAV-D**)
- **Outreach and education** to prepare NSRS users
- Continue to provide **technical assistance** to FEMA and other partners to explore full leveraging of time-dependent NSRS features through data-driven case studies