

# Alaska's Continuously Operating Reference Network (ACORN)



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# ACORN GOALS



Creation of Alaska's  
Continuously Operating  
Reference Network

- Statewide GNSS coverage with real-time network

Help modernize Alaska's  
geodetic infrastructure

- Identify existing assets, form partnerships for inclusion in ACORN, and upgrade when necessary

Add value to the scientific  
community

- Collaboration with research groups on placement and construction of new stations that could aid in future research

Offer RTN & data services  
to the public

- The State of Alaska considers ACORN a public service and data products will be shared freely

## USE OF EXISTING GNSS DATA

### State of Alaska to provide

- Funding for existing GNSS operators to upgrade equipment
- Network Processing Software within SOA
- Data in various formats

### Partner To Provide

- Free or paid access to existing data stream
  - National Park Service
  - City of Fairbanks
  - EarthScope (UNAVCO)

## SOA PROVIDED EQUIPMENT

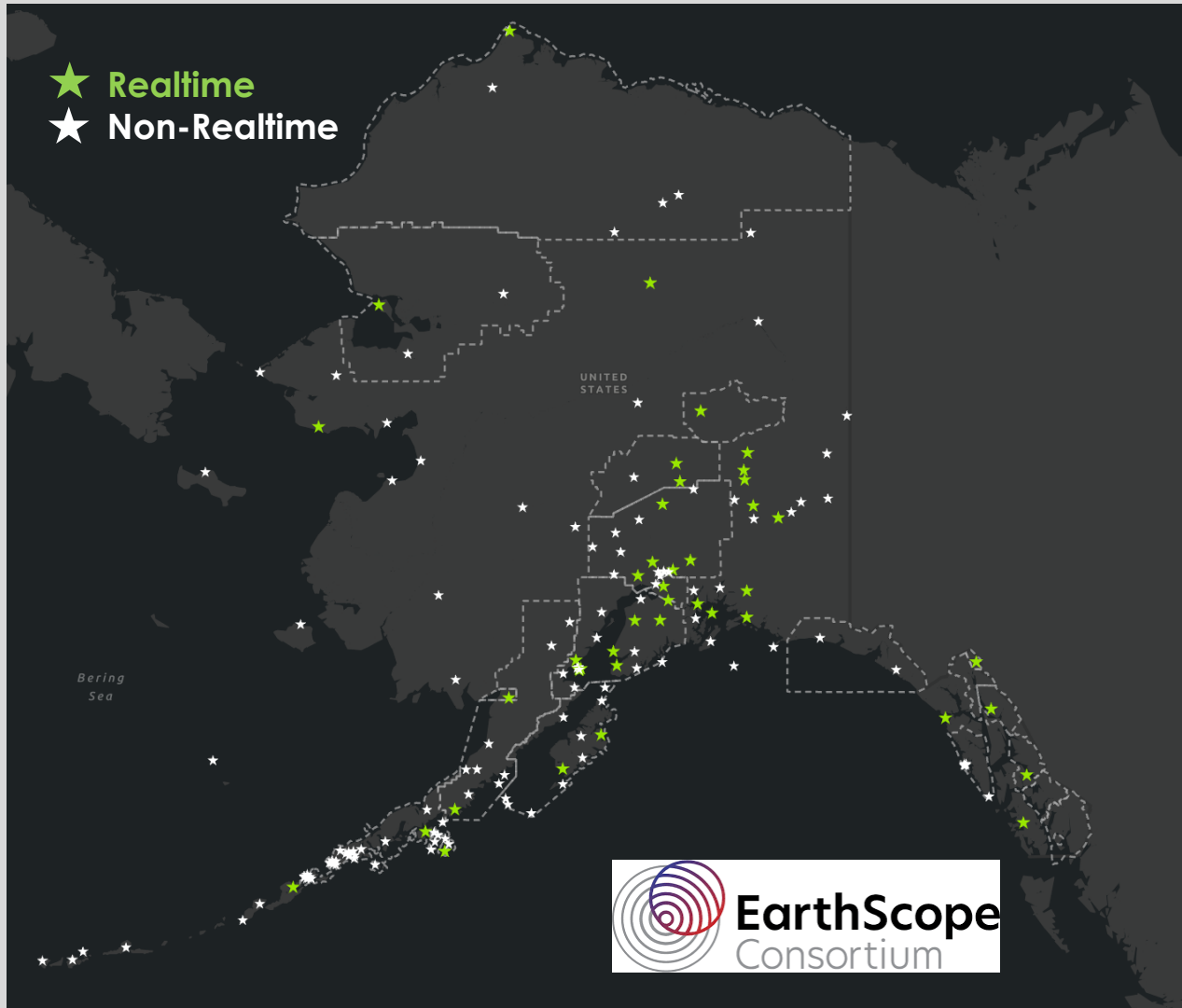
### State of Alaska To Provide:

- Full GNSS Station including installation materials
  - Network Processing Software within SOA
  - Support for training
  - Maintenance & upkeep

### Partner to provide

- Location, power, data connection
- IT & Facilities coordination
- Local contact for minor troubleshooting

# ACORN PARTNERSHIPS



# ACORN PARTNERSHIPS

- Park Headquarters & Airstrip Installations
- PPK (Timing) & Ground Control for SfM Projects
- Focus on GIS & Contracted Survey projects in Parks
- Leverage dual-frequency systems (Trimble R series, Leica GG04, EOS Gold)
- Partnership with USFWS (Homer, Soldotna)



# ACORN PARTNERSHIPS



**For Immediate Release: October 12, 2023**

## **DNR, UAA Partner on Global Navigation Satellite System**

*The collaboration will enhance the statewide GNSS infrastructure through the ACORN network*

**Anchorage, Alaska** – DNR and the University of Alaska Anchorage (UAA) College of Engineering have embarked on a pioneering partnership to establish a cutting-edge Global Navigation Satellite Systems (GNSS) reference station at the Engineering and Industry Building at UAA. This strategic collaboration aims to revolutionize Alaska's technical resources - fostering growth, efficiency and opportunities for economic development across the state. The GNSS reference station at UAA will serve as a catalyst for groundbreaking advancements in geospatial technology benefiting both the academic community and the broader public. Through real-time GNSS corrections, UAA students and faculty in the [Geomatics program](#) will be empowered to conduct fieldwork, fostering hands-on learning experiences and elevating the quality of research and educational outcomes.



# ACORN INSTALLATIONS



ACORN

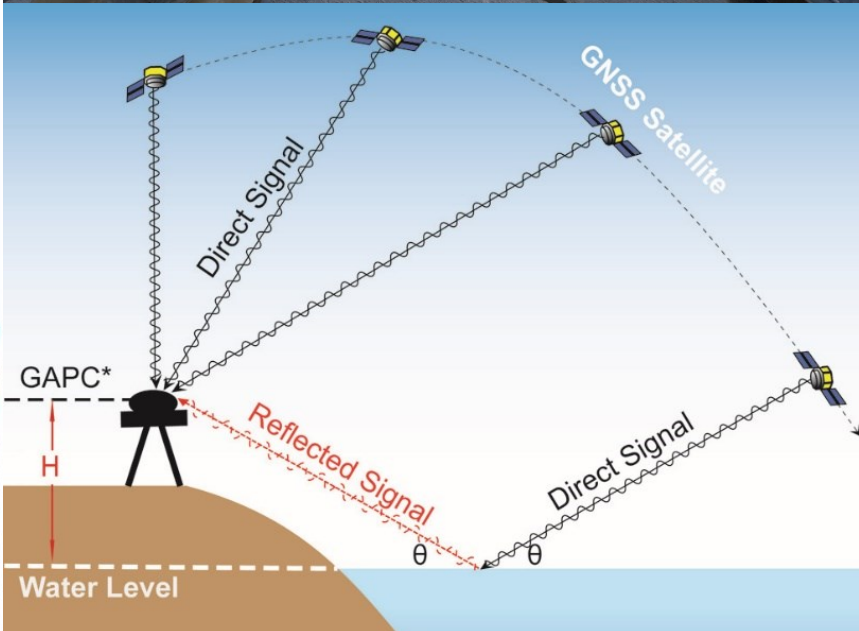
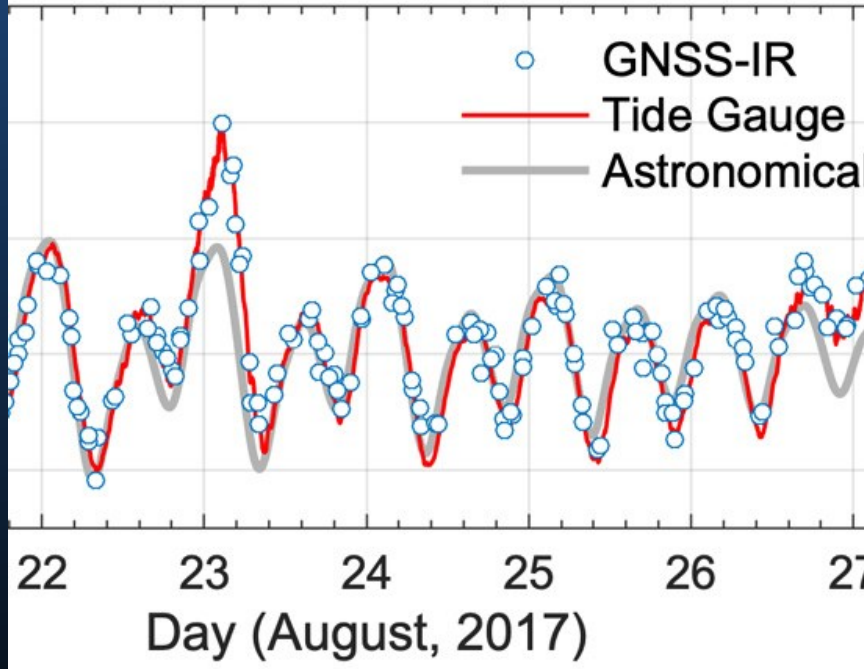


## Alaska DOT&PF

- AMHS Ferry Terminals
- Rural Airports
- Highway Maintenance Stations
- RWIS Locations

# ACORN INSTALLATIONS

## AMHS FERRY TERMINALS



Option 1 is well suited for GNSS-R because of its broad water visibility.

\*GAPC: GNSS Antenna Phase Center



# ACORN WEB INTERFACE

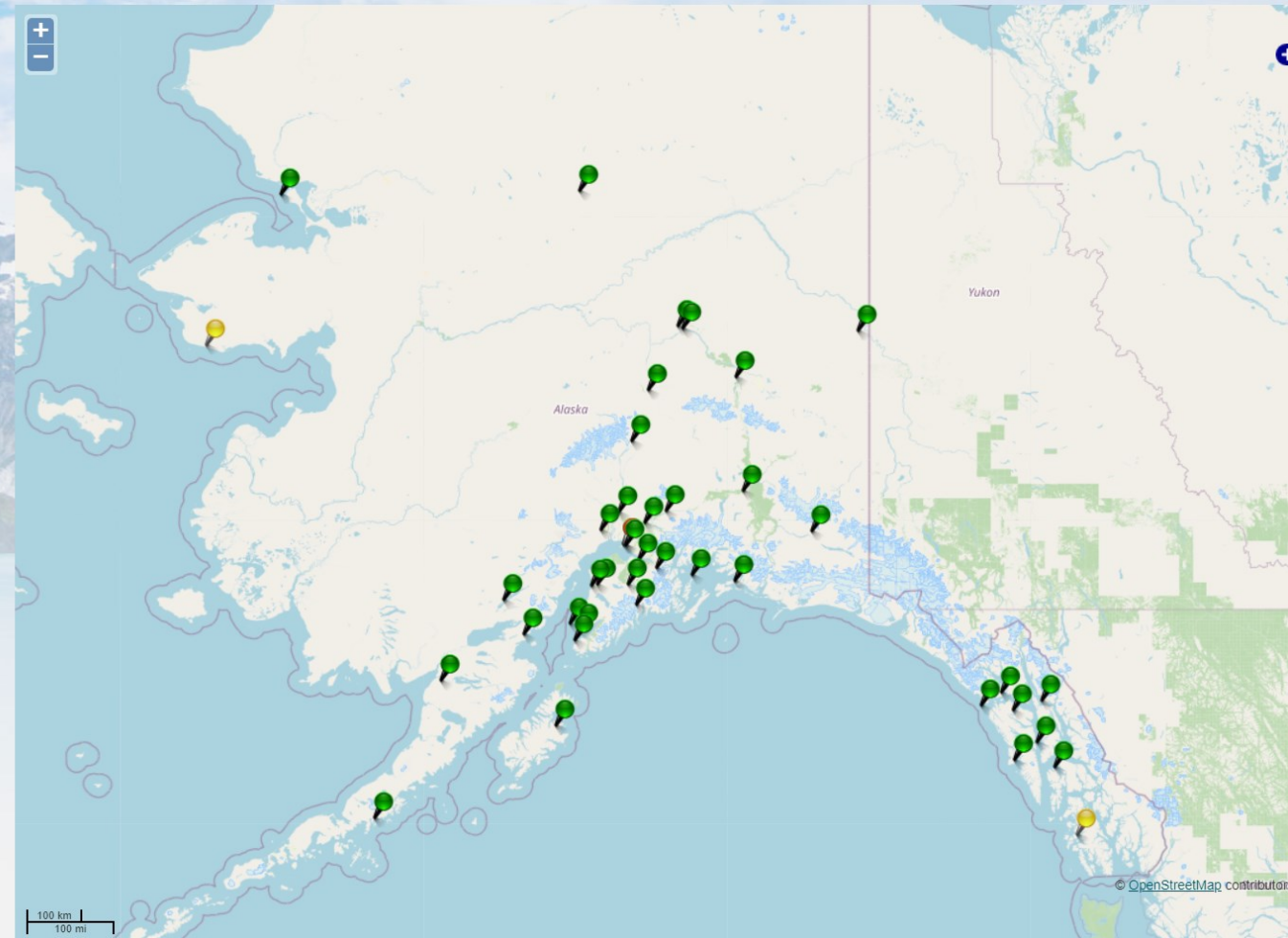


## ACORN - Alaska Continuously Operating Reference Network

Home > Sensor Map

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  - VRS iScope
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    - Add Status Messages
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  - User Management**
    - User Management
    - Create User
    - Approve Users
    - Export e-mail addresses
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    - Extended User Info
    - Info Fields

### Sensor Map



- 42 sensors:
- AKMT\_NPS
  - AKRO\_NPS
  - AKUA
  - ANGN
  - CDVA
  - City of Fairbanks
  - GAAR\_NPS
  - GLBX\_NPS
  - HNAH
  - Juneau
  - KAKE
  - KEFJ\_NPS
  - KNAI\_NPS
  - LACL\_NPS
  - SKAA
  - UNAVCOAB11
  - UNAVCOAB18
  - UNAVCOAB43
  - UNAVCOAB49
  - UNAVCOAC03
  - UNAVCOAC11
  - UNAVCOAC15
  - UNAVCOAC20
  - UNAVCOAC21
  - UNAVCOAC23
  - UNAVCOAC24
  - UNAVCOAC32
  - UNAVCOAC48
  - UNAVCOAC53
  - UNAVCOAC59
  - UNAVCOAC67
  - UNAVCOAC71
  - UNAVCOAC75
  - UNAVCOATW2
  - UNAVCOCLGO
  - UNAVCOGRNX
  - UNAVCOSELD
  - WHTR
  - WRS2\_NPS
  - WRS3\_NPS
  - YUCH\_NPS
  - zzSTARTEST

# ACORN POST PROCESSING



[ACORN @ Pivot Web](#) [Post-Processing](#) [My Orders](#) [Test Ground](#)

[Admin](#)

Welcome to the ACORN Online Processing service.

This service allows you to upload GNSS observation data and receive absolute positioning calculations based on the reference stations in the network.

Additional information and requirements:

- Supported data formats are RINEX 2.xx, RINEX 3.xx, Hatanaka-compressed RINEX files, Trimble proprietary data formats (DAT, TGD, T01 and T02).
- Data files must be static only.
- Data files must contain dual frequency pseudorange and carrier phase observations (L1 and L2).
- If your observation data consists of several files, please compress them to a ZIP archive and upload the zipped file. All files inside the archive must belong to the same station and have identical header information regarding receiver type and antenna type.

Select a file to upload (.t01, .t02, .??o, .??d, .tgd, .dat, .zip)

Browse

Your email address

Overwrite rod height in file



[ACORN @ Pivot Web](#) [Post-Processing](#) [My Orders](#) [Test Ground](#)

[Admin](#)

Orders in Progress

Order	Filename	Upload Time [UTC]	Email Address	Status
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Processed Orders

Order	Filename	Upload Time [UTC]	Email Address	Status
15	05131660.T02	2023-07-05 20:03	peter.flint@alaska.gov	Delivered
14	05132120.T02	2023-07-05 18:02	peter.flint@alaska.gov	ProcessingFailed
12	tsea3480.22o	2022-12-23 19:26	admin@invalid.invalid	Delivered
11	akse3300.22o	2022-12-02 22:11	admin@invalid.invalid	Delivered
10	akse3310.22o	2022-11-29 23:49	peter.flint@alaska.gov	Delivered
9	fai13310.22o	2022-11-29 23:23	peter.flint@alaska.gov	Delivered
8	tsea3310.22o	2022-11-29 23:02	peter.flint@alaska.gov	Delivered
7	akse3310.22o	2022-11-29 22:31	peter.flint@alaska.gov	Delivered
6	07783280.T02	2022-11-25 18:35	peter.flint@alaska.gov	ProcessingFailed
5	07783280.T02	2022-11-25 18:31	peter.flint@alaska.gov	ProcessingFailed

«   »

# ACORN REFERENCE DATA SHOP



## Reference Data Shop - Reference Stations

Choose one or more reference stations by clicking in the list or in the map. If you want to select multiple stations from the list, press and hold down the CTRL key and click with the mouse.

### Available Reference Stations

Station name: KAKE  
Station code: KAKE  
Latitude: N 56° 57' 41.06103"  
Longitude: W 133° 55' 15.05736"  
Elevation: 8.326

- GLBX\_NPS
- HNAH
- Juneau
- KAKE
- KEFJ\_NPS
- KNAL\_NPS
- LACL\_NPS
- SKAA
- UNAVCOAB11
- UNAVCOAB18
- UNAVCOAB43
- UNAVCOAB49
- UNAVCOAC03
- UNAVCOAC11
- UNAVCOAC14
- UNAVCOAC15
- UNAVCOAC20
- UNAVCOAC21
- UNAVCOAC23
- UNAVCOAC24
- UNAVCOAC32
- UNAVCOAC48
- UNAVCOAC53
- UNAVCOAC59
- UNAVCOAC67

<< Back: Station Type Selection   Next: Time Selection >>

## Reference Data Shop - Date & Time Selection

You have selected the following reference station(s):

**(KAKE) KAKE, (AC67) UNAVCOAC67**

Please enter your desired observation period:

### Observation Period

Date: 10/16/2023

Start time: 14 h 0 m 0 s

Duration: 2 h 30 m

Interval: 15 s

Time system: GPS

<< Back: Reference Stations   Next: Add to order >>

## Reference Data Shop - Your current Order

The following items are currently in your order. You may add further items, remove items or proceed with delivery options and data generation.

	Station	Start time	End time	Duration (min.)	Interval (sec.)	Epochs	Est. Price*
<input type="radio"/>	(KAKE) KAKE	10/16/2023 2:00 PM	10/16/2023 4:30 PM	150	15	600	0.00 USD
<input type="radio"/>	(AC67) UNAVCOAC67	10/16/2023 2:00 PM	10/16/2023 4:30 PM	150	15	600	0.00 USD
	<b>Total:</b>			<b>300</b>		<b>1200</b>	<b>0.00 USD</b>

Applying to selected item:

Login used for this order: Admin

## Reference Data Shop - Delivery Options

You can choose to either download the generated reference data files or to send them to you by e-mail. In the latter case you don't have to wait until the files are generated, which may take some time, depending on the amount of requested data.

- Download the data
  - Notify me by e-mail when the data is generated
- or
- Send me the data by e-mail

Choose the file format (all files will be packed into a single ZIP archive):

RINEX 2.11

<< Back: Current Order   Next: Generate Data >>



# Thank you!

PETER FLINT

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[AGC GEODETIC TWG SITE](#)

