



**States and Local Government Subcommittee  
of the  
Civil GPS Service Interface Committee**

**19 November 2015**



# OUTLINE

*Evolving  
Organization*

- Organization and Management
- Outreach
- Global Service Center

*Common  
Issues*

- Mapping
- Search and Rescue
- Service Center Cooperation

# GPS Civil Users Need A Means For:

Providers should disseminate system information (system status, health and modernization plans).

Need worldwide user input/feedback (feedback on adequacy of signals for user needs, new applications).

Global industry participation is key.

An interference/outage reporting mechanism is needed (process for interference detection and mitigation).

Users must have an advocate (a means by which system users can be represented in all parts of the system planning and operation).

# CGSIC Charter

Civil GPS Service Interface Committee was chartered in 1986 to be that forum.

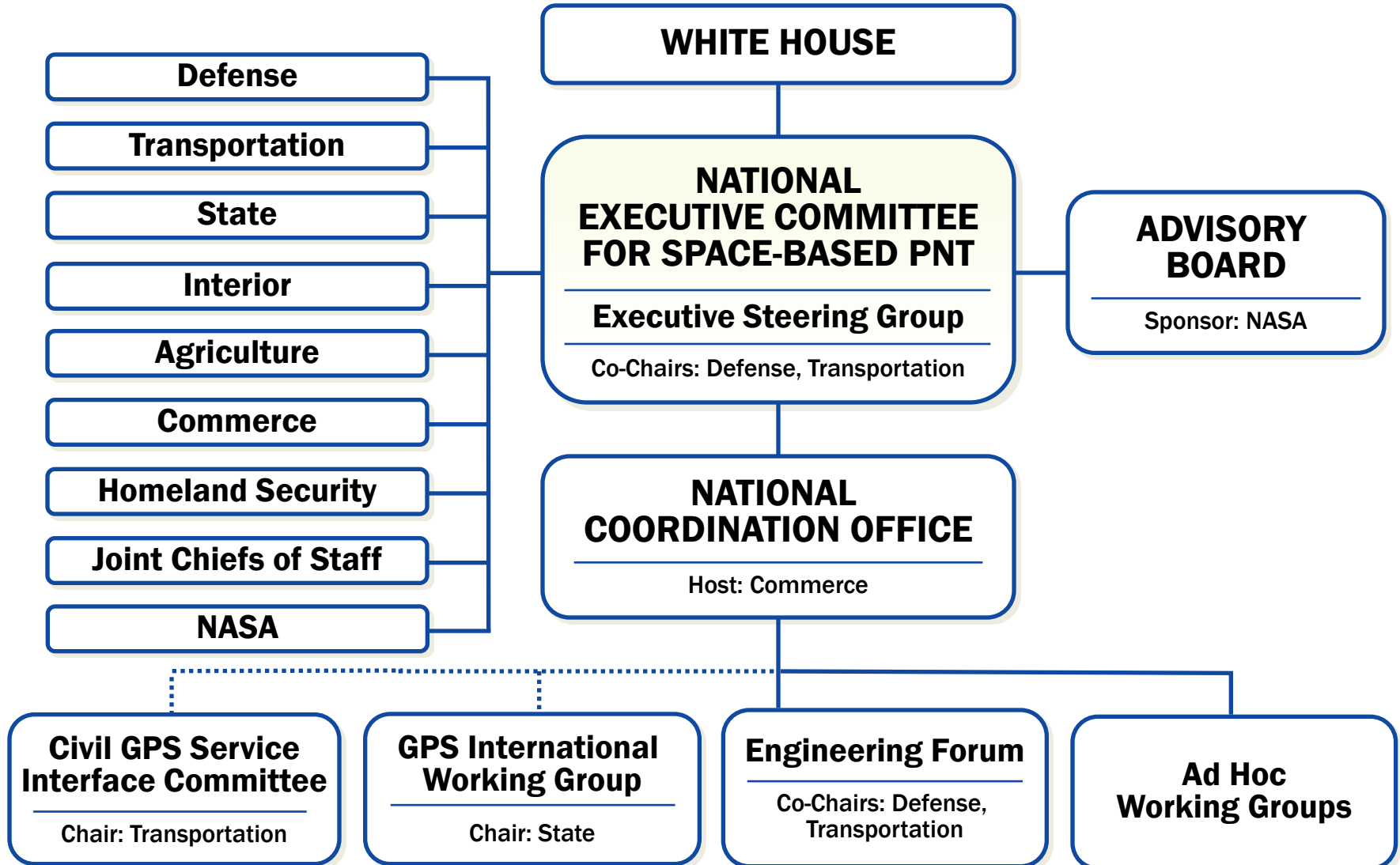
Recognized worldwide forum for effective interaction between all civil GPS users and the U.S. GPS authorities.

Established and chartered to identify civil GPS user needs (e.g. positioning, navigation, and timing).

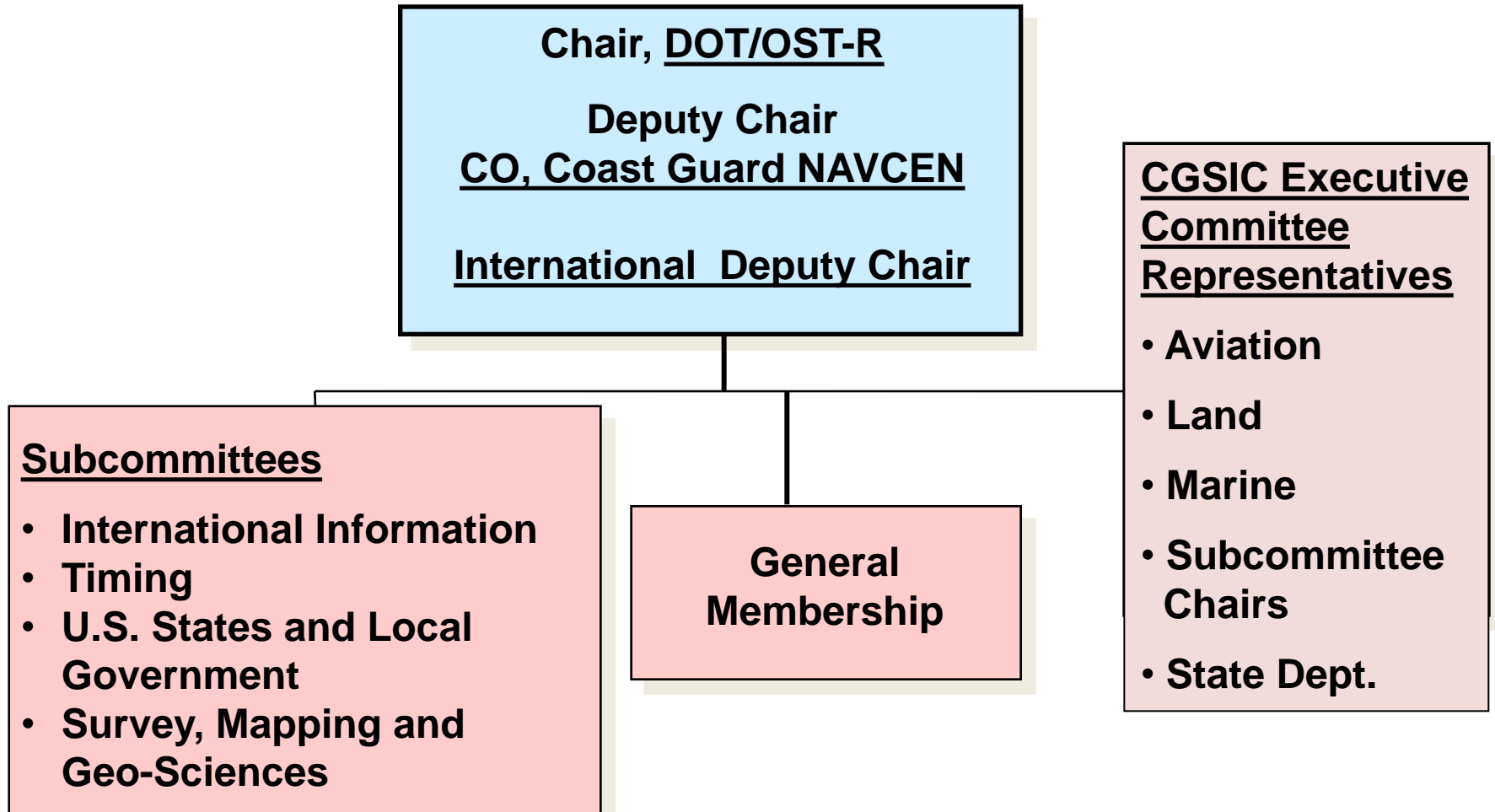
Exchange information concerning GPS with the worldwide civil user community.

Reports activities to the Office of the Assistant Secretary for Research and Technology.

# U.S. Space-Based PNT Organization Structure



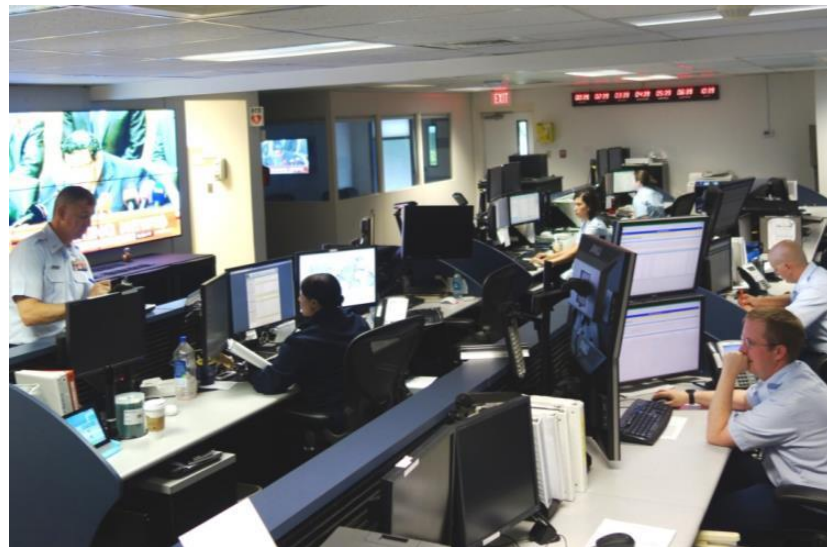
# Civil GPS Service Interface Committee (CGSIC)



**CGSIC is the World-Wide Forum Between Civil GPS Users and U.S. Government Service Providers**

# A Global Service Center

- U.S. Coast Guard Navigation Center (NAVCEN) is U.S. government **civil service center** for GPS.
- Website, RSS feeds and e-mail list servers **distribute** all operational GPS data products and interface documents.
- **Answer inquiries** and disruption reports from around the world 24/7/365 customer service **watch** .
- Represent user communities and **advocate** for civilian use of GPS at meetings of the GPS Program.
- **Coordinate** operations with other Provider service centers.



# Users reporting mapping problems

- “My Grandmother’s address is wrong in GPS and I am worried about emergency services getting to her. You need to fix it.”
- “My customers cannot find my business location in GPS, please fix it.”
- “GPS is directing customers to a competitor’s location instead of mine. The address is wrong and needs to be corrected.”
- “GPS is sending trucks down our road that cannot fit. You have to stop them.”
- “If you send one more car down my driveway in the middle of the night, I don’t care, I’m putting out a spike strip.”



# Easy to dismiss but....

- These are your users and system as a whole is blamed.
- Some are economically important business users:

Grocery Stores

Hotels

Dealerships

Tech industry

Gas Station

Government Services

Financial services



- Unless the address has been accurately recorded by a Geographic Information Systems (GIS) data mapper, it may, in fact, not be in the correct location.
- Education is important and necessary.

# COSPAS-SARSAT

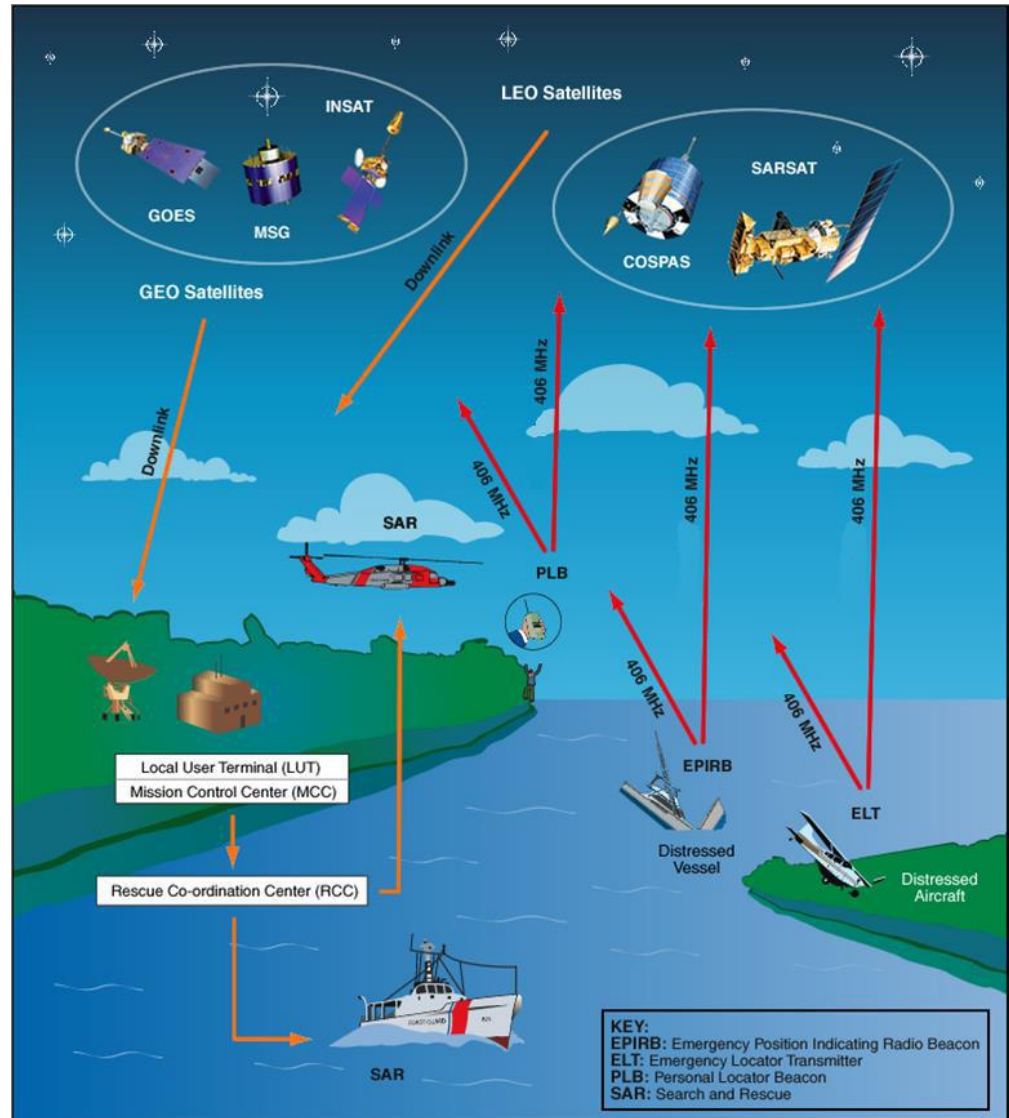
**5** Low Earth Polar Orbiting Search And Rescue (LEOSAR) .

**7** Geostationary Orbiting Search And Rescue (GEOSAR) with 2 under test.

**8** Medium Earth Orbiting Search and Rescue (MEOSAR).

**30** mission control centers.

MEOSAR will replace the LEO SAR portion of the program when the LEO satellites reach end-of-life. GPS-III SV #11 and beyond.



# MEOSAR

The COSPAS-SARSAT Program uses some MEOSAR constellation already. Includes 3 satellites with an operational L-band downlink repeater: **2** Glonass-K1 and **6** Galileo satellites (**2 IOV and 4 FOC**).

- Experimental Distress Alerting Satellite System (DASS) repeaters with S-band downlink aboard all IIR-M and IIF GPS satellites.
- **19** active now:
- DASS scheduled for all GPS-III satellites #01 - #08.
- #11 and beyond planned to have the new GPS-SAR L-band payload.





# Future of U.S. NDGPS



- Current system utilizes 84 broadcast sites to provide positioning accuracy of 1-3 meters across 92% of CONUS
- Few users of the NDGPS broadcast
- USCG, DOT, and US Army Corps of Engineers Plans:
  - Retain NDGPS at 21 sites for single station near-shore coverage
  - Decommission 62 sites
  - One US Army Corps of Engineers (USACE) site to remain
- Termination of NDGPS broadcast at 62 proposed sites planned for Jan. 15, 2016\*

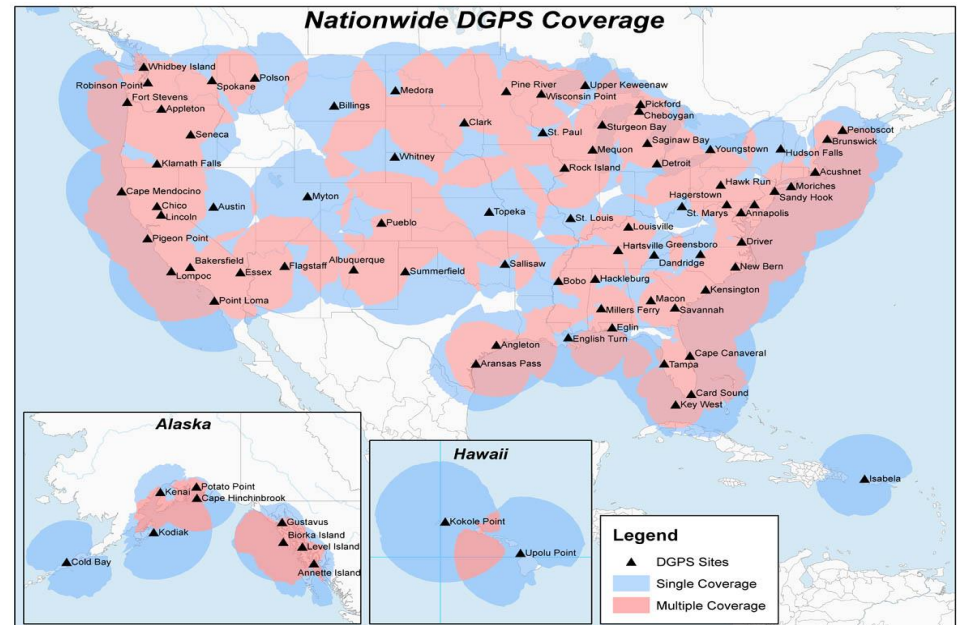


# Nationwide Differential GPS (NDGPS)



## System Description

- 84 Nationwide Remote Broadcast Sites throughout the United States and territories
  - 92% nationwide signal coverage
  - Better than 10 meter accuracy
  - 10 second integrity alarm to the user
  - Satisfies Harbor/Harbor Approach requirements
  - 99.7% availability requirement



## Operations

- Redundant equipment at sites
- Redundant controls stations at NAVCEN

## Stakeholders

- U.S. Army Corps of Engineers (USACE)
- Department of Transportation (DOT)
- U. S. Coast Guard (USCG)



# Contributing Factors



- Discontinuation of Selective Availability:
  - Intentional signal degradation, known as SA, was disabled in 2000 allowing full signal accuracy to civil users
- Lack of USCG requirements.
- Widespread use of the Federal Aviation Administration (FAA) Wide Area Augmentation System (WAAS).
- Continued GPS modernization:
  - Additional civil frequencies allow for correction of ionospheric error
- Reduced availability of consumer grade DGPS receivers.
- Federal Railroad Administration has no NDGPS requirement for Positive Train Control.
- Agriculture sector uses commercial DGPS services.



# 2013 Federal Register Notice

---



- Joint DHS/USCG and DOT/RITA Federal Register Notice (FRN) Request for Public Comments [78 FR 22554; April 16, 2013]
- Targeted Outreach to User Community
- USG Requirements Assessed
- Direct Questions:
  - (1) Do you use NDGPS in its current form for positioning, navigation, and timing?
  - (2) What would be the impact if the NDGPS were to be discontinued?
  - (3) Are there alternatives that could be used to meet your PNT requirements?
  - (4) Are there alternative uses for the existing NDGPS infrastructure?
- Responses were few.....



# Assessment on Comments in Docket

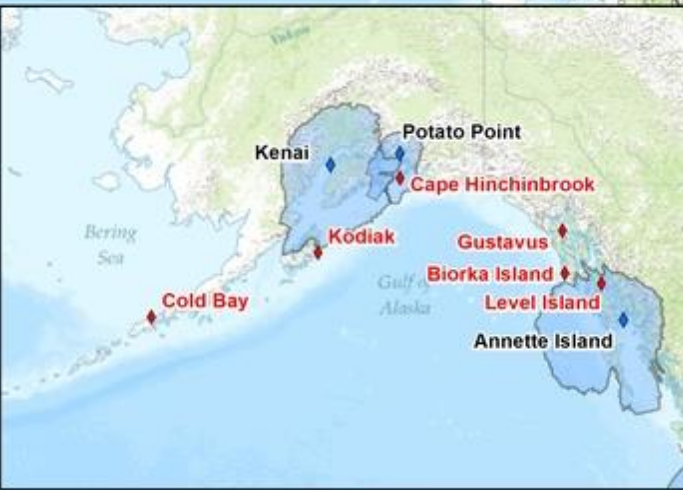
---



- Few users of the NDGPS broadcast
  - Majority of use is for maritime sector
  - Primarily Pilots for precision shiphandling
- Bottom Line:
  - Insufficient users to justify a nationwide live broadcast









## Next Steps



- November 16<sup>th</sup>, 2015: 90-day FRN commentary period closes
- November 20<sup>th</sup>, 2015: Impact analysis report assesses commentary.
- December 15<sup>th</sup>, 2015: Local Notice to Mariner message released with notification of sites decommissioning.
- January 15<sup>th</sup>, 2015:
  - Sites will be decommissioned.
  - Decommissioning may be delayed for those sites with unmitigated impacts identified in the analysis of public comment.
- Alternative uses for decommissioned DGPS sites will be examined.

# Cooperation between Global Service Centers

- Work on interoperability, compatibility and transparency in our systems through the International Committee on GNSS.
- Work country-to-country through official bi-lateral GNSS talks to improve communications between centers.
- Connect our service centers together for day-to-day operations to benefit user communities of the world.
- Improve processes for Information sharing to respond to the needs of equipment manufacturers and user communities.

Home » Support » CGSIC » Meetings » Tampa 2015

**SUPPORT:**

Frequently Asked Questions

Address, Route, & Map Problems

Service Outages & Status Reports

Civil GPS Service Interface Committee (CGSIC)

**Meetings**

U.S. State & Local Govt Subcomm

International Info Subcomm

Timing Subcomm

Surveying, Mapping, & Geo-Sciences Subcomm

Technical Documentation

External Links

About This Website

Website Feedback

**TAKE ACTION:**

Bookmark this page

Share this page via Facebook, Twitter, etc.

Print this page

Get website updates via RSS

Comment on



# 55th Meeting of the Civil GPS Service Interface Committee



**At the Institute of Navigation GNSS+ 2015 Conference  
Tampa Convention Center  
14-15 September 2015**



## Agenda

Jump to session:  
[Timing](#) | [USSLS](#) | [IISC](#) | [SM&G](#) | [Plenary](#)

**MONDAY, 14 SEPTEMBER 2015**

8:15 a.m. **Registration**

Morning Concurrent Sessions:

· **TIMING SUBCOMMITTEE** ·  
Chair: Dr. Włodzimierz Lewandowski, European Space Agency (ESA) Navigation Program Board (PB-Nav)  
Co-Chair: Dr. Victor Zhang, National Institute of Standards and Technology (NIST)

# Civil GPS Service Interface Committee (CGSIC)

## Contact Information

U.S. Coast Guard Navigation Information Service

<http://www.navcen.uscg.gov>

E-mail: [nisws@navcen.uscg.mil](mailto:nisws@navcen.uscg.mil)

Phone: +1 703 313 5900

Fax: +1 703 313 5920



Executive Secretariat

E-mail: [rick.hamilton@uscg.mil](mailto:rick.hamilton@uscg.mil)

# BACKUP SLIDES

# Overview of FRN Responses 1 of 3

Category	Respondents	Summary Comments
<u>Maritime-Related (U.S.)</u>	<ul style="list-style-type: none"> <li>• 9 Pilots' Organizations + 2 individual members</li> </ul>	<ul style="list-style-type: none"> <li>• Universally opposes DGPS reduction/removal in pilotage areas; several technical/safety concerns</li> <li>• Universal negativity to WAAS as substitute augmentation system in pilotage and navigation</li> <li>• Most correspond to USCG Vessel Traffic Service (VTS) areas (e.g., Houston, New York, Seattle)</li> </ul>
	<ul style="list-style-type: none"> <li>• 2 private industry partners</li> </ul>	<ul style="list-style-type: none"> <li>• Quotes IALA R-121 that removal of SA does not remove requirement for augmentation</li> <li>• Uses data acquisition for underwater investigations</li> </ul>
<u>Non-Maritime (U.S.)</u>	<ul style="list-style-type: none"> <li>• 3 State DOTs</li> <li>• 2 Local DOT/DPW</li> </ul>	<ul style="list-style-type: none"> <li>• Uses for highway design and monument integrity</li> <li>• Uses CORS data for RTN; not use broadcast</li> <li>• Uses DGPS-based CORS for project control, post-processing, automated survey and construction</li> <li>• Uses DGPS – critical for survey, mapping, GIS and data sets, coastal and maritime navigation and environmental applications</li> <li>• Suggests use in GPS+GLONASS streaming RTK applications</li> </ul>



# Overview of FRN Responses 2 of 3

Category	Respondents	Summary Comments
<u>Associations (U.S.)</u>	<ul style="list-style-type: none"> <li>• 1 Shipping Association</li> </ul>	<ul style="list-style-type: none"> <li>• Seeks measurement on relative position fixing capability of DGPS signal v. uncorrected GPS</li> </ul>
	<ul style="list-style-type: none"> <li>• 1 PNT Association</li> </ul>	<ul style="list-style-type: none"> <li>• Cites 30,000 daily navigation users in CONUS + tens of thousands at sea</li> <li>• Suggests NDGPS as most reliable augmentation for surface applications, and as backup for power, IT and other critical infrastructure outages; and natural disaster recovery</li> </ul>
	<ul style="list-style-type: none"> <li>• 1 Conservation Assn.</li> </ul>	<ul style="list-style-type: none"> <li>• Uses for GIS, emergency response</li> </ul>
<u>Private Sector</u>	<ul style="list-style-type: none"> <li>• 2 private industry partners</li> </ul>	<ul style="list-style-type: none"> <li>• Concerns for loss of critical accurate/reliable CORS stations for research, survey and mapping</li> <li>• Limits integration with SBAS and diversity of high integrity PNT services; suggests integration into national PNT network</li> <li>• Suggests integration with wide area nationwide Network RTK, and ubiquitous nationwide high accuracy location and timing</li> </ul>

# Overview of FRN Responses 3 of 3

<u>Category</u>	<u>Respondents</u>	<u>Summary Comments</u>
<u>Individuals</u>	<ul style="list-style-type: none"> <li>• 4 individuals</li> </ul>	<ul style="list-style-type: none"> <li>• Uses for remote sensing elevation data/coastal management decisionmaking</li> <li>• Concerns for loss of realtime NAD83 data, WAAS accuracy insufficient</li> <li>• Most accurate system for obstructed areas</li> <li>• Specific concerns for NDGPS broadcast and CORS loss in Alaska, Hawaii, Puerto Rico</li> </ul>
<u>International</u>	<ul style="list-style-type: none"> <li>• 3 international organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing use of Portable Pilot Navigation Systems/ Personal Pilot Units requiring reliable signal input</li> <li>• Concerns for loss of DGPS attributes and impact on broader aims of e-Navigation</li> <li>• Limits integration with SBAS, diversity of high integrity PNT services</li> <li>• No use in Canadian cadastral surveying</li> </ul>
<u>Federal Agencies</u>	<ul style="list-style-type: none"> <li>• 5 Federal agencies</li> </ul>	<ul style="list-style-type: none"> <li>• CORS at DGPS sites critical; not use broadcast (2)</li> <li>• Concerns for accuracy impacts on OPUS</li> <li>• Can replace with WAAS, but not RAIM (accuracy)</li> <li>• No impact (2)</li> </ul>

# Proposed Maritime Sites for Decommissioning - USCG (27)

- Appleton, WA
- Biorka, AK
- Bobo, MS
- Brunswick, ME
- Cape Hinchinbrook, AK
- Cheboygan, MI
- Cold Bay, AK
- Driver, VA
- Eglin, FL
- Gustavus, AK
- Isabela, PR
- Key West, FL
- Kodiak, AK
- Kokole Point, HI
- Level Island, AK
- Lompoc, CA
- Mequon, MI
- New Bern, NC
- Penobscot, ME
- Pigeon Point, CA
- Robinson Pt, WA
- Saginaw, MI
- Sandy Hook, NJ
- Sturgeon Bay, WI
- Upper Keweenaw, MI
- Wisconsin Point, WI
- Youngstown, NY

# Proposed Inland Sites for Decommissioning – DOT (29)

- Albuquerque, NM
- Austin, NV
- Bakersfield, CA
- Billings, MT
- Chico, CA
- Clark, SD
- Dandridge, TN
- Essex, CA
- Flagstaff, AZ
- Greensboro, NC
- Hackleburg, AL
- Hagerstown, MD
- Hartsville, TN
- Hawk Run, PA
- Hudson Falls, NY
- Klamath Falls, OR
- Macon, GA
- Medora, ND
- Myton, UT
- Pine River, MN
- Polson, MT
- Pueblo, CO
- Savannah, GA
- Seneca, OR
- Spokane, WA
- St. Marys, WV
- Summerfield, TX
- Topeka, KS
- Whitney, NE

# Proposed Inland Sites for Decommissioning - USACE (6)

- Louisville, KY
- Millers Ferry, AL
- Rock Island, IA
- Sallisaw, OK
- St. Louis, MO
- St. Paul (Alma), MN