GPS World
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Geospatial solutions
APPLYING THE POWER OF PLACE

Is the GPS/GNSS Surveying and Mapping User Community Ready for SC 24?

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Editor - *Geospatial Solutions*

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GPS/GNSS Surveying and Mapping

Outline

- Who uses high-precision GNSS receivers?
- Which high-precision users would likely be affected?
- Are they ready?

GPS/GNSS Surveying and Mapping

- ***Land surveying/engineering*** (property boundaries, road design/layout, site construction, drainage).

Machine Control

- Construction (bulldozers, excavators), ship docking,

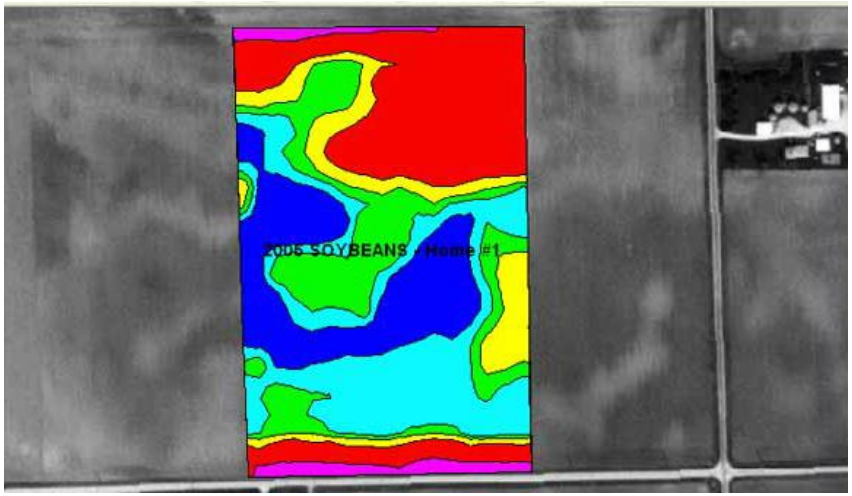
Machine Control - Example

GIS Mapping

- Infrastructure, environment, urban/rural forestry, municipalities, utilities, natural resources, E-911.

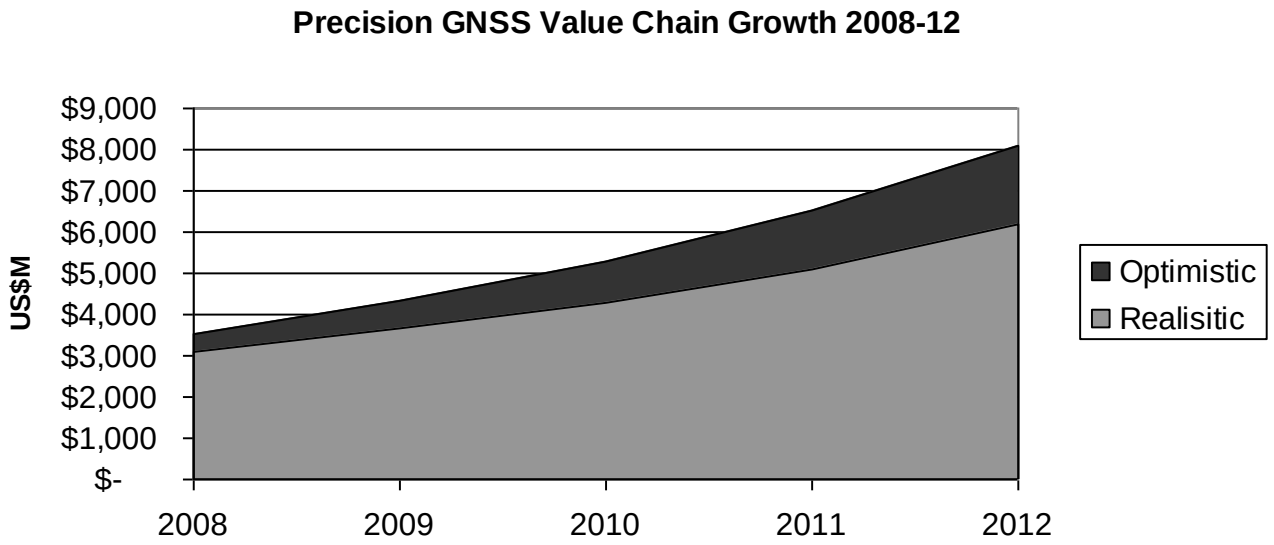
Precision Agriculture

- Field mapping, yield monitoring, auto-steer planting, variable-rate fertilizer application, crop-dusting.



GNSS Market Growth (<10cm)

The value of precision GNSS products and services was ~US$3B in 2008 and projected to grow to US$6-8B by 2012, a CAGR of 19-23%.



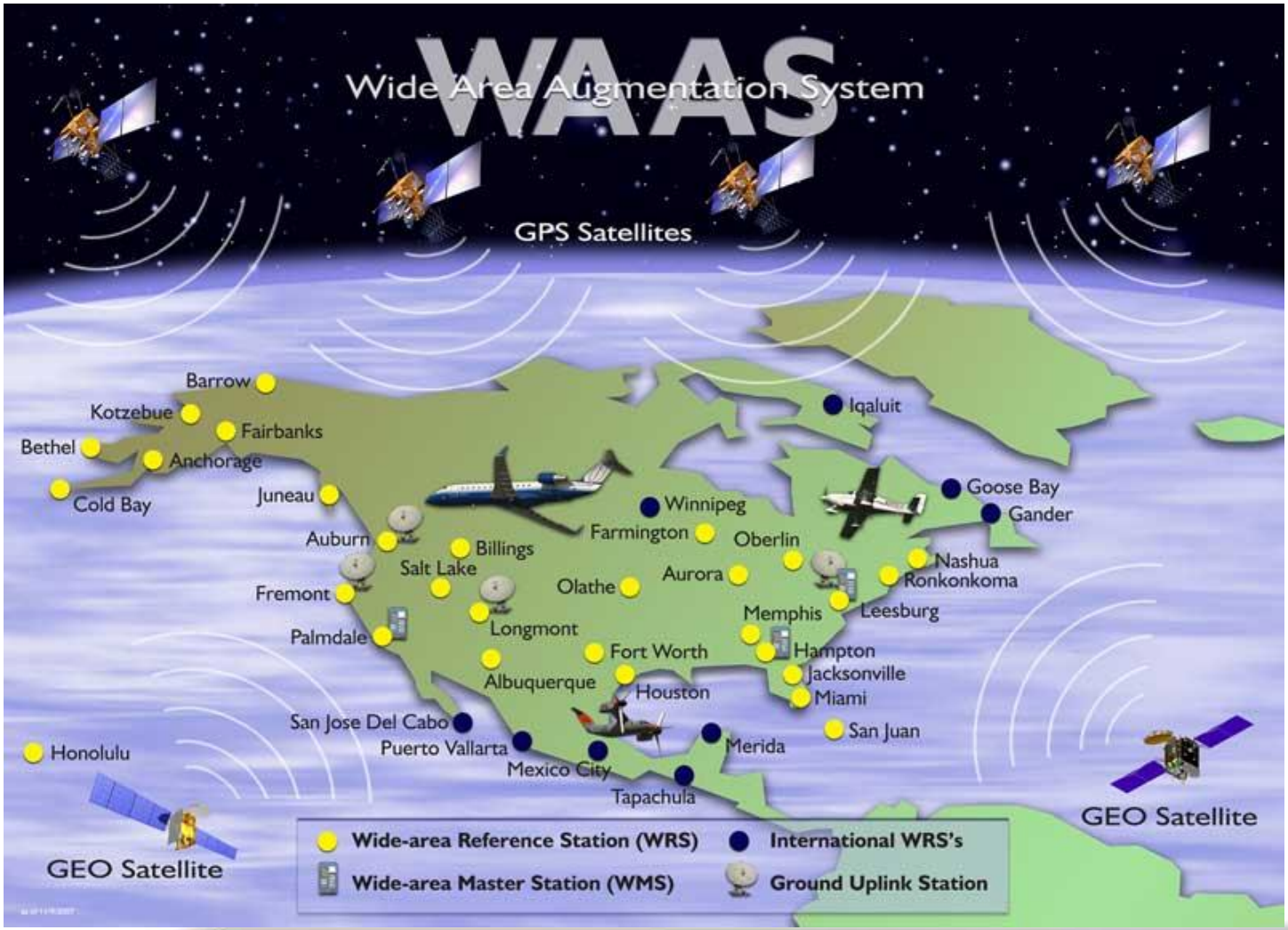
Source: Position Report – GNSS Precise Positioning Market Report – 2008-2012

GNSS Market Growth

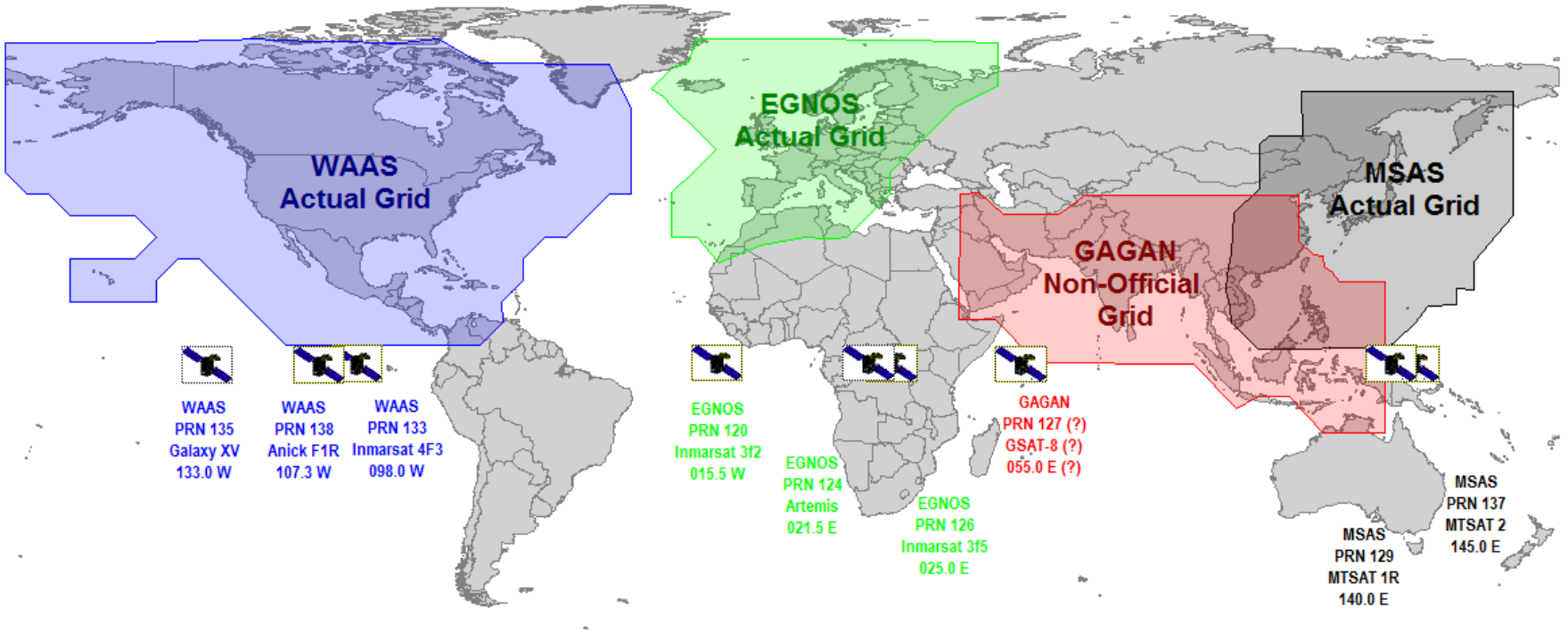
-SBAS (WAAS/EGNOS/MSAS/GAGAN/SDCM) continue to build-out and provide free sub-meter corrections, thus stimulating market expansion for high-performance GPS L1 receivers.

-Growth of RTK Networks, providing high precision GPS corrections, have exploded in the past five years with over 37 state DOT's operating an RTK Network and over 80 total.

SBAS (WAAS) Infrastructure



World-wide SBAS



WAAS for Surveying/Mapping

- WAAS provides free GPS corrections (since 2003).
- Tens of thousands of surveying/mapping GPS users rely on WAAS for accurate GPS corrections daily.
- WAAS accuracy has been excellent:
- 24 hr data set (1 Hz), Arizona Test Site, GPS L1

Beacon:	68%= .64m, 95%=.98m, 99%=1.2m
WAAS:	68%= .45m, 95%=.69m, 99%=.86m
OmniSTAR VBS:	68%= .28m, 95%=.43m, 99%=.53m

WAAS for Surveying/Mapping

Advantages of WAAS/SBAS:

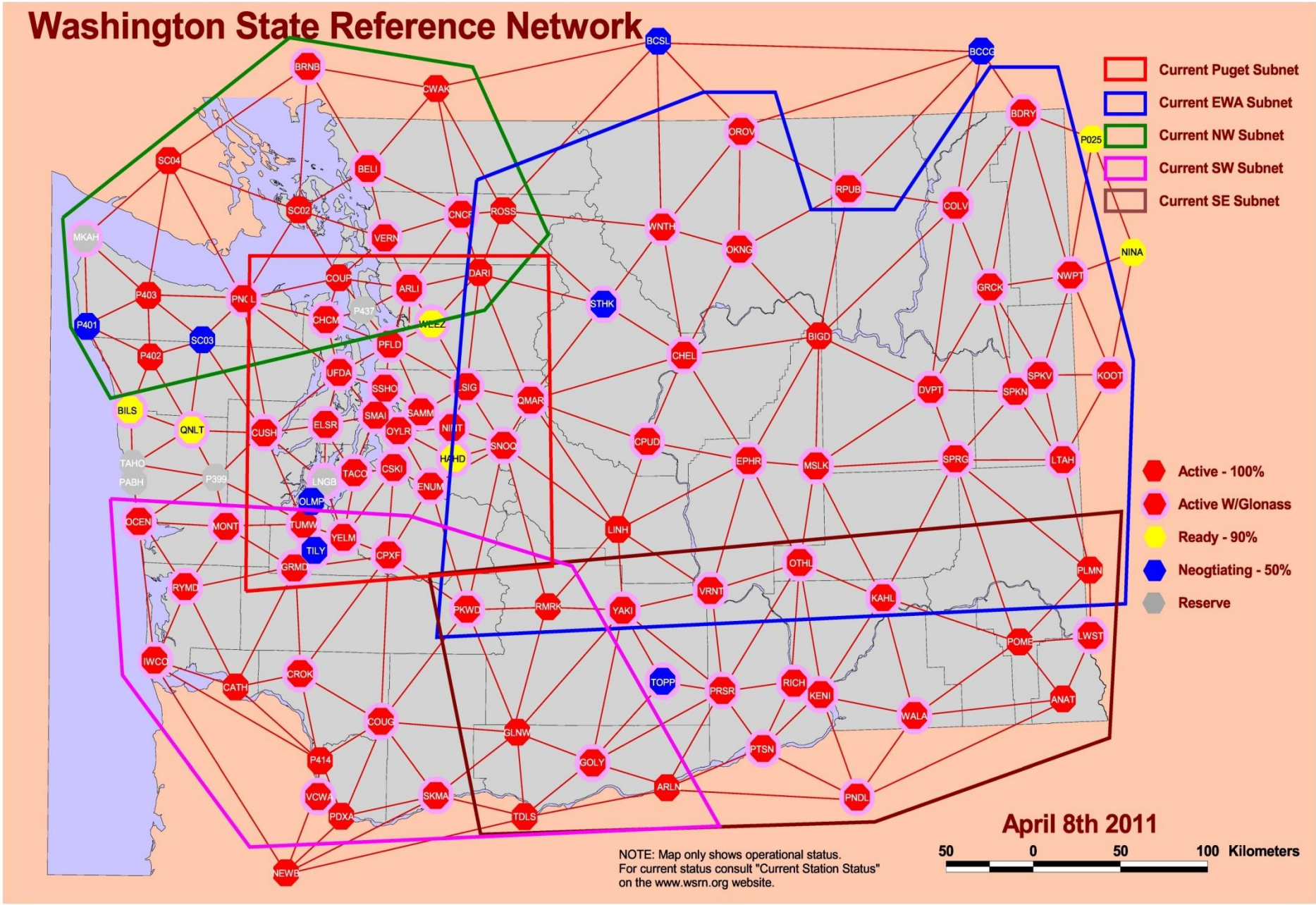
- Free, accurate, wide coverage area, no extra hardware required.

Disadvantages of WAAS/SBAS:

- Relies heavily on ionospheric modeling, only 38 reference stations cover all of North America.

RTK Networks for Surveying/Mapping

- Growth of RTK Networks, providing high precision GPS corrections, have exploded in the past five years with over 37 state DOT's operating an RTK Network and over 80 total in the U.S.
- A key benefit of RTK Networks is the extended spacing between reference stations, allowing fewer GNSS reference stations to provide service to a wider area.
- The extended spacing between reference stations is possible due to advanced atmospheric modeling.



Are They Ready for SC 24?

Is the GPS/GNSS Surveying and Mapping User Community Ready for SC 24?

Are They Ready for SC 24?

- High-performance GPS L1 receivers have become much less expensive since SC 23.
- SBAS (since 2003) have become the de facto standard for real-time GPS corrections.
- World-wide RTK Networks have experienced explosive growth in the last five years.
- The GPS has been extremely reliable.
- Leading to…

Are They Ready for SC 24?

- …a sense of confidence that it will continue to work with the same accuracy and reliability as they've become accustomed to.
- An iono disturbance notification system is needed that's tailored to tens of thousands of GPS surveying and mapping users.
- Mainstream media raises too many red flags.
- Need "stop light" simplicity.

Questions?

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