GPS World

MARKET INSIGHTS

WEBINAR

RTK ON YOUR SMARTPHONE OR TABLET

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THE BUSINESS & TECHNOLOGY OF GNSS

NAVCOM
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Geospatial solutions

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Agenda

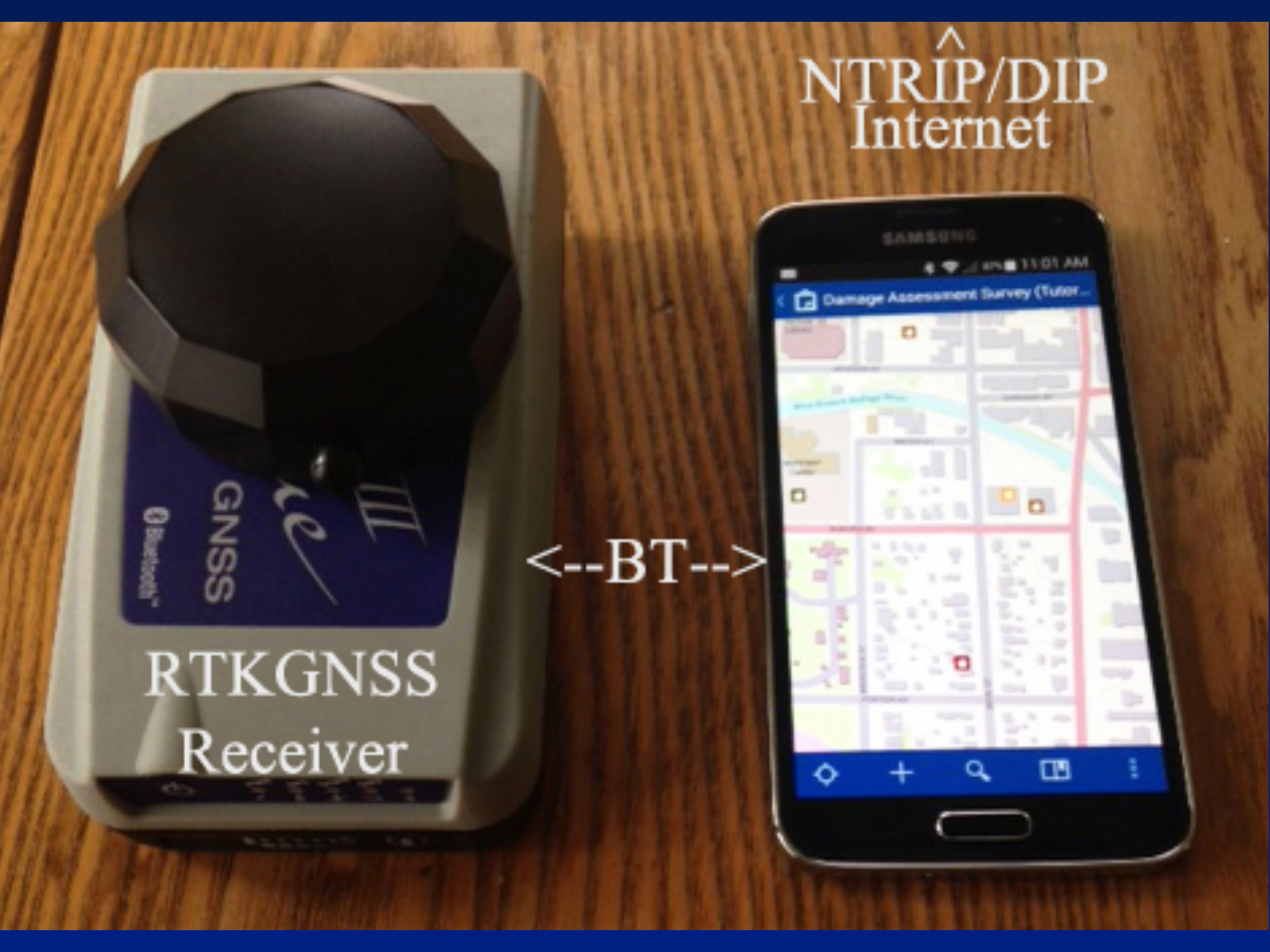
- What is RTK?
- What components are required for using RTK?
- Whose RTK base can I use?
- Which smartphones and tablets can you use with RTK?
- Audience Q&A

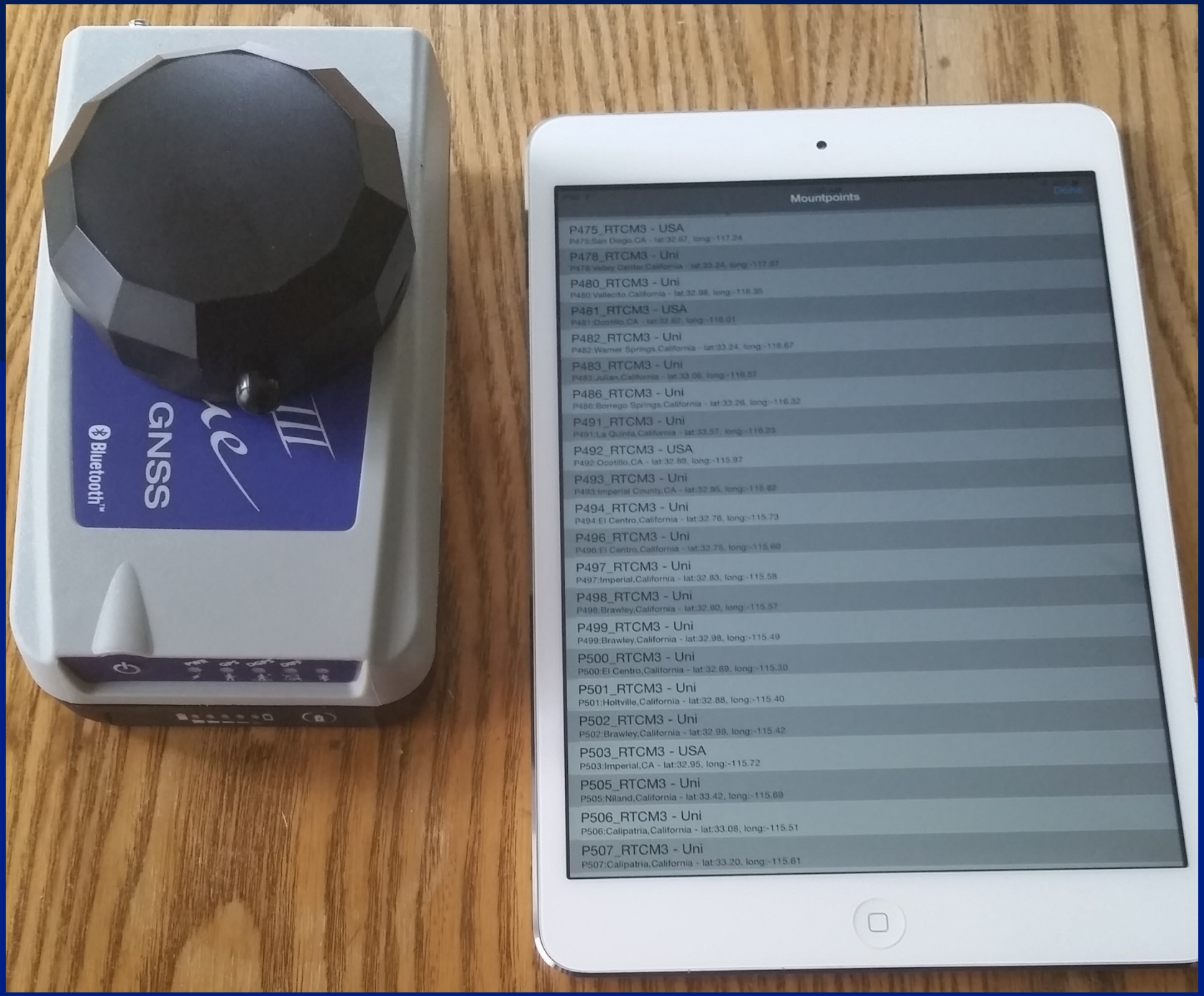
What is RTK?

- A technique used by a GNSS receiver to provide 1cm real-time precision
- Satellite tracking and initialization time
- Data connection to an RTK base station required
- Used mostly with L1/L2 receivers, but L1-only RTK is possible. The internal GNSS receiver in consumer mobile devices aren't RTK-capable.

RTK Components

- An RTK-capable GNSS receiver. Not the GNSS receiver inside the smartphone or tablet.
- Mobile device (smartphone or tablet)
- Data collection software
- NTRIP/DIP utility (may be inside Data collection s/w)
- Access to a RTK base
- Wireless data connection to RTK base


NTRIP/DIP
Internet
GNSS
<--BT-->
RTKGNSS
Receiver
SAMSUNG
11:01 AM
Damage Assessment Survey (Tutor...


GNSS
Bluetooth
Mountpoints
Done
P475_RTCM3 - USA
P475:San Diego,CA - lat:32.67, long:-117.24
P478_RTCM3 - Uni
P478:Valley Center,California - lat:33.24, long:-117.07
P480_RTCM3 - Uni
P480:Vallecito,California - lat:32.98, long:-116.35
P481_RTCM3 - USA
P481:Ocotillo,CA - lat:32.82, long:-116.01
P482_RTCM3 - Uni
P482:Warner Springs,California - lat:33.24, long:-116.67
P483_RTCM3 - Uni
P483:Julian,California - lat:33.06, long:-116.57
P486_RTCM3 - Uni
P486:Borrego Springs,California - lat:33.26, long:-116.32
P491_RTCM3 - Uni
P491:La Quinta,California - lat:33.57, long:-116.23
P492_RTCM3 - USA
P492:Ocotillo,CA - lat:32.89, long:-115.97
P493_RTCM3 - Uni
P493:Imperial County,CA - lat:32.95, long:-115.82
P494_RTCM3 - Uni
P494:El Centro,California - lat:32.76, long:-115.73
P496_RTCM3 - Uni
P496:El Centro,California - lat:32.75, long:-115.60
P497_RTCM3 - Uni
P497:Imperial,California - lat:32.83, long:-115.58
P498_RTCM3 - Uni
P498:Brawley,California - lat:32.90, long:-115.57
P499_RTCM3 - Uni
P499:Brawley,California - lat:32.98, long:-115.49
P500_RTCM3 - Uni
P500:El Centro,California - lat:32.69, long:-115.30
P501_RTCM3 - Uni
P501:Holtville,California - lat:32.88, long:-115.40
P502_RTCM3 - Uni
P502:Brawley,California - lat:32.98, long:-115.42
P503_RTCM3 - USA
P503:Imperial,CA - lat:32.95, long:-115.72
P505_RTCM3 - Uni
P505:Niland,California - lat:33.42, long:-115.69
P506_RTCM3 - Uni
P506:Calipatria,California - lat:33.08, long:-115.51
P507_RTCM3 - Uni
P507:Calipatria,California - lat:33.20, long:-115.61

Mobile Devices

- Traditional Windows/Windows mobile devices
- Android smartphones and tablets
- iPhone and iPad
- Windows 8/Phone 8
- Operating system wars: Windows, Android, iOS. Why does it matter?

Selecting a Mobile Device for RTK

- Smartphone or Tablet?
- Outdoor readable screen in different conditions (eg. Temperature)
- App software. NTRIP/DIP software
- Wireless data connection coverage
- Battery life, etc.
- Consumer vs. Industrial?

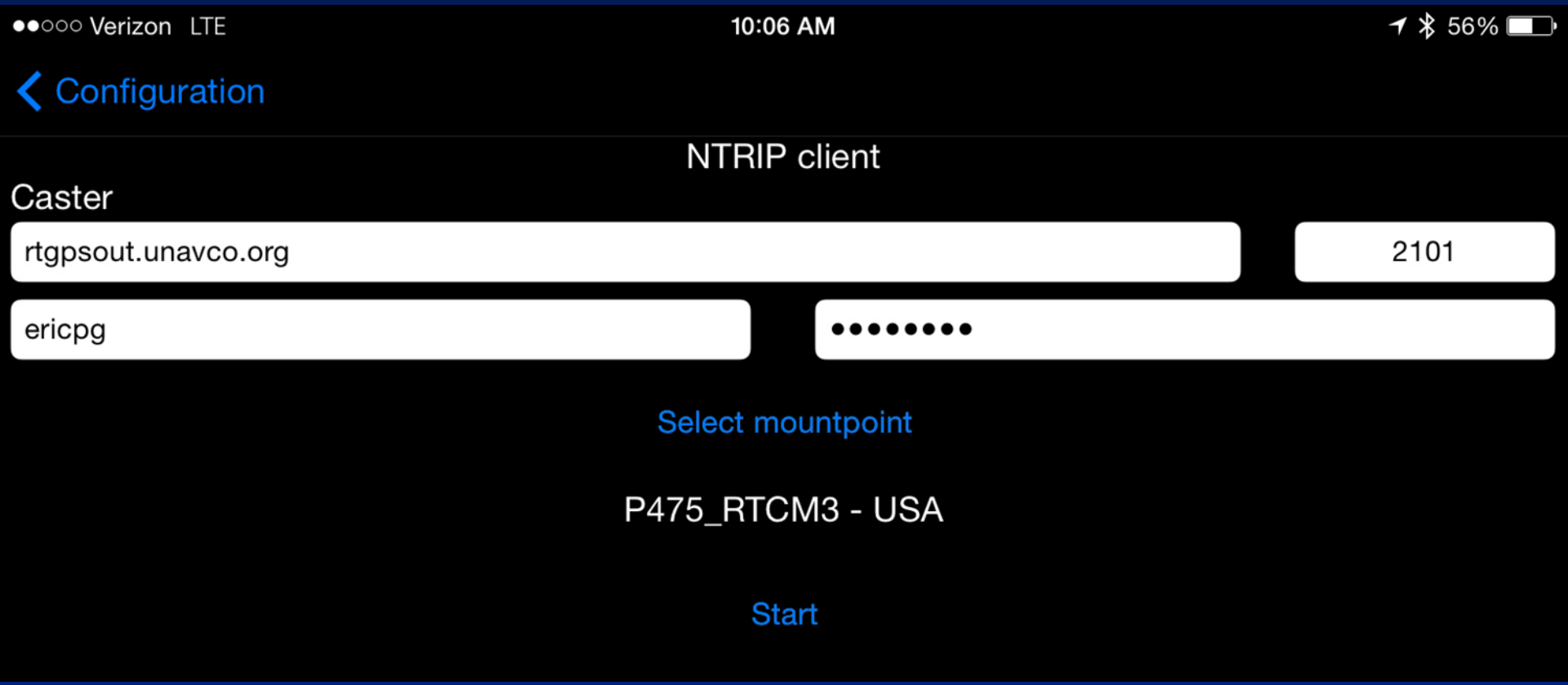
Data Collection Software

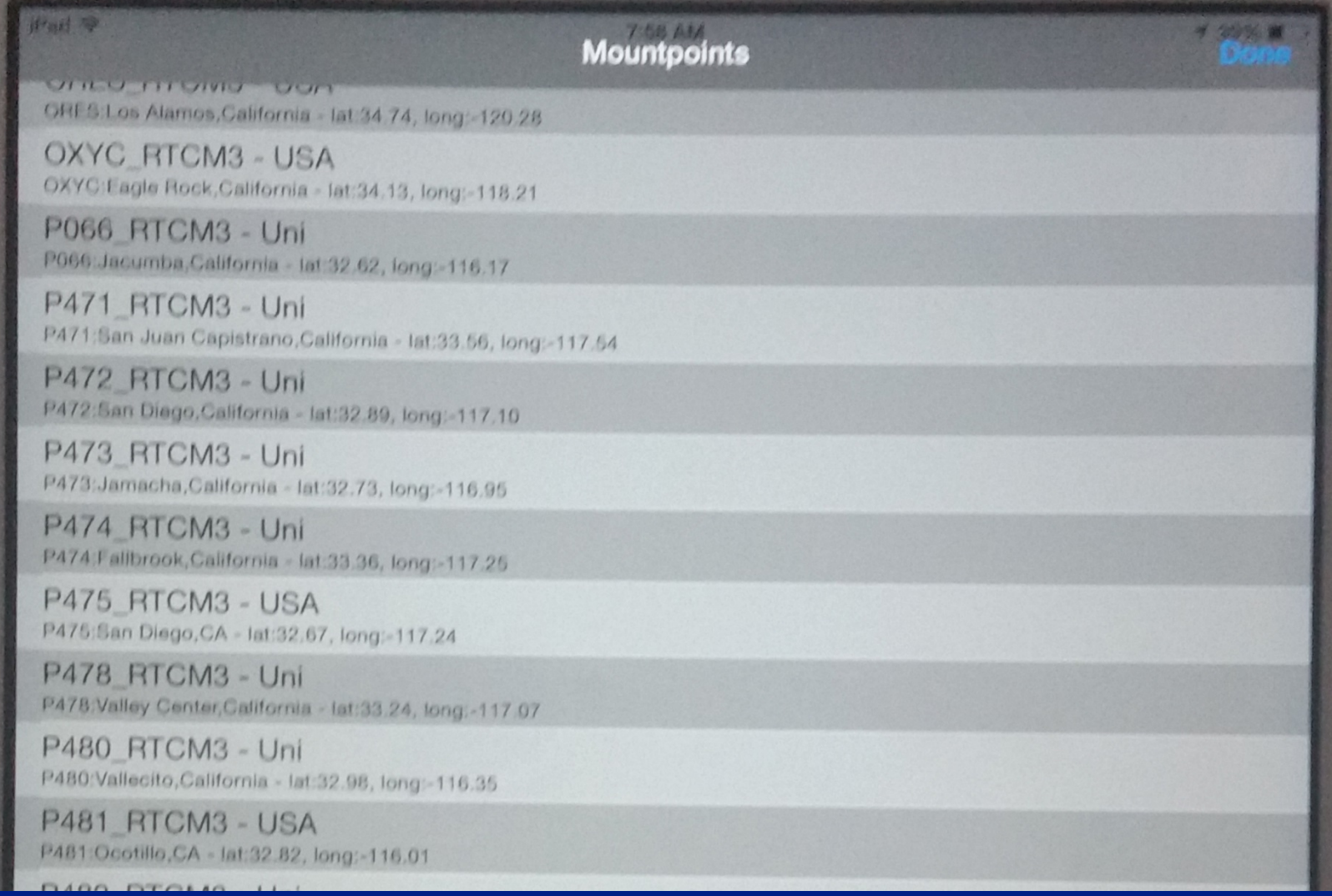
- Data collection software may be a key consideration depending on your workflow.
- Changing landscape due to Android and iOS popularity
- Many Windows/Windows Mobile data collection software haven't migrated to Android/iOS (eg. ArcPad, SurvCE, etc.)
- New breed of data collection software running across several platforms. E.g. Collector, Fulcrum, Amigocloud, etc.

NTRIP/DIP utility software

- NTRIP = Networked Transport of RTCM via Internet Protocol. Menu selection of RTK base mount points.
- DIP = Direct IP. No menu selection. Direct to IP address.
- Some data collection software have NTRIP/DIP features built-in to the software.
- Free and low-cost third party NTRIP and DIP software utilities are available so you may use any Location app software with RTK. Even Google Maps for navigating!

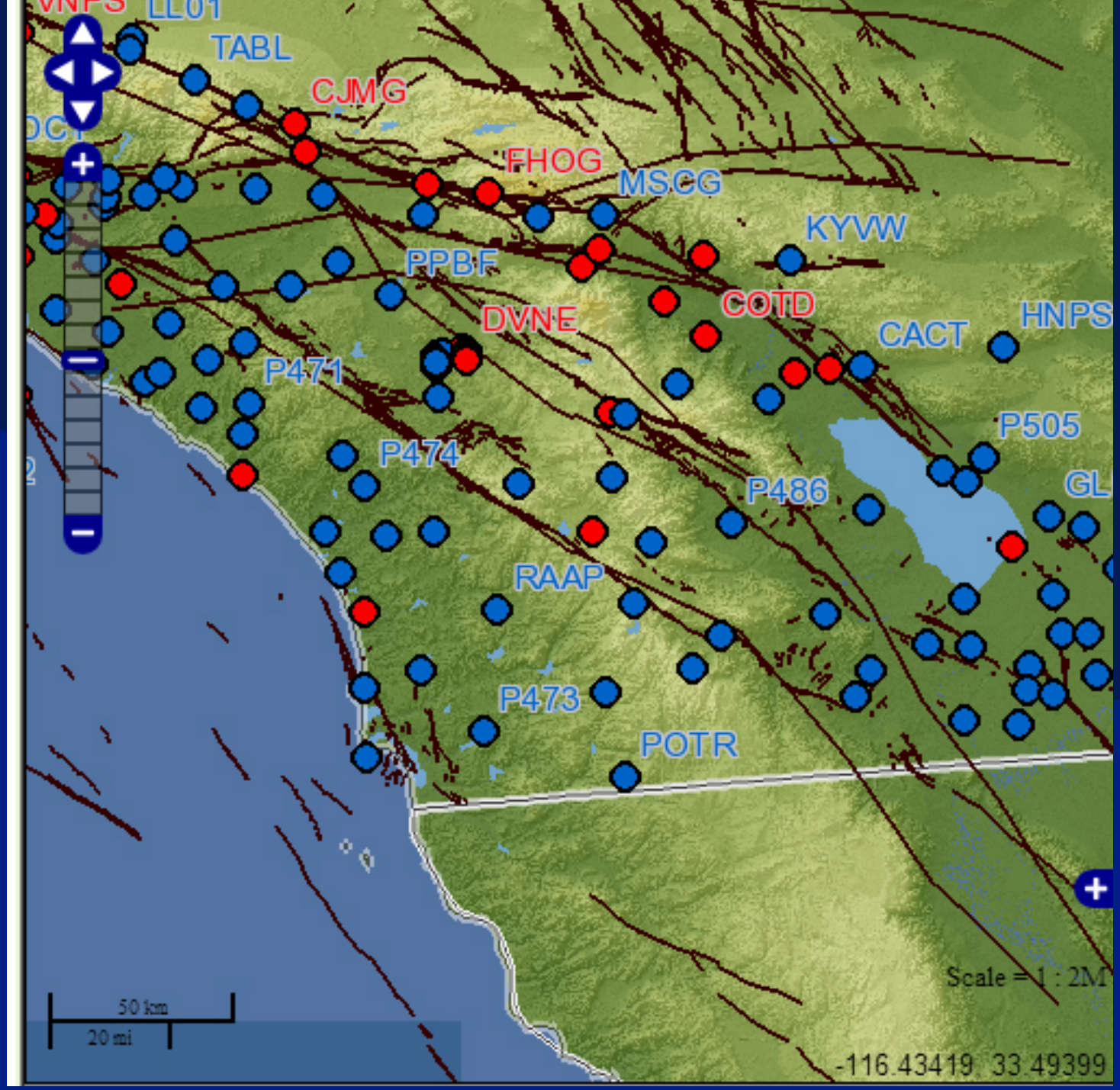
NTRIP parameters

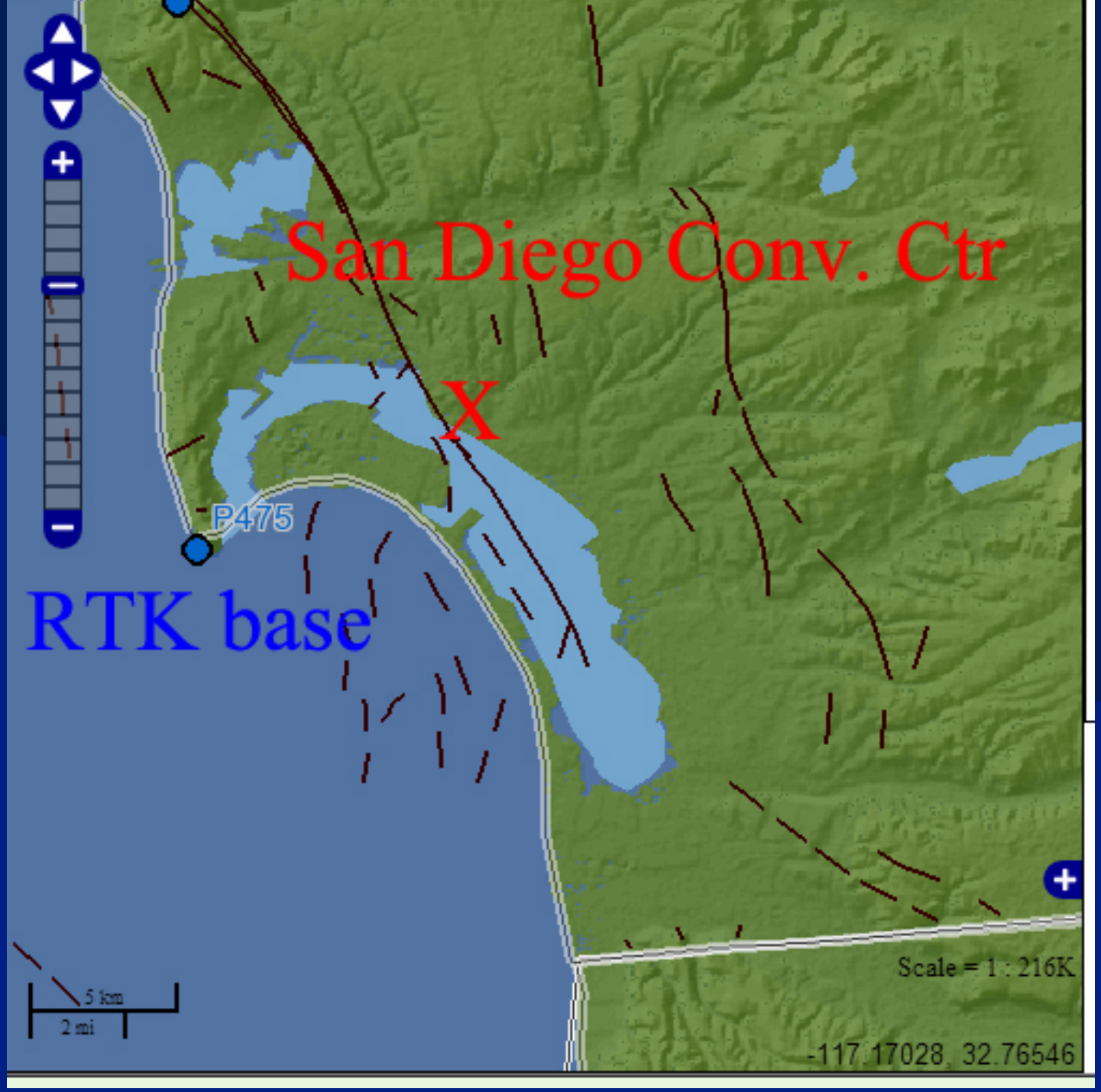


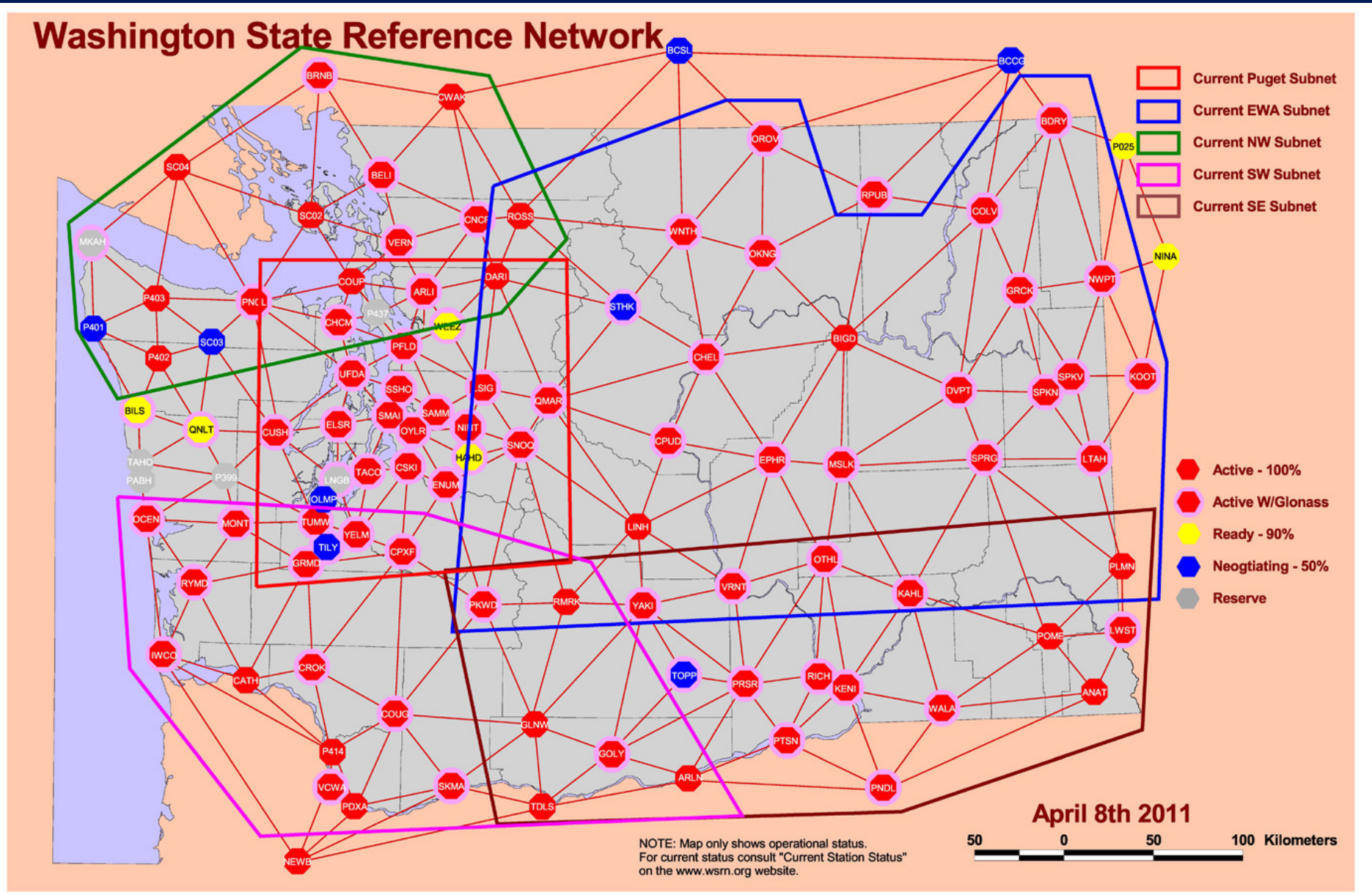

iPad
7:58 AM
Mountpoints
Done
ORES:Los Alamos,California - lat:34.74, long:-120.28
OXYC_RTCM3 - USA
OXYC:Eagle Rock,California - lat:34.13, long:-118.21
P066_RTCM3 - Uni
P066:Jacumba,California - lat:32.62, long:-116.17
P471_RTCM3 - Uni
P471:San Juan Capistrano,California - lat:33.56, long:-117.54
P472_RTCM3 - Uni
P472:San Diego,California - lat:32.89, long:-117.10
P473_RTCM3 - Uni
P473:Jamacha,California - lat:32.73, long:-116.95
P474_RTCM3 - Uni
P474:Fallbrook,California - lat:33.36, long:-117.25
P475_RTCM3 - USA
P475:San Diego,CA - lat:32.67, long:-117.24
P478_RTCM3 - Uni
P478:Valley Center,California - lat:33.24, long:-117.07
P480_RTCM3 - Uni
P480:Vallecito,California - lat:32.98, long:-116.35
P481_RTCM3 - USA
P481:Ocotillo,CA - lat:32.82, long:-116.01

RTK Base Availability?

- GPS World article “List of Public RTK Base….”
- Subscription fee vs. no subscription fee
- RTK Network vs. Single baseline
- Wireless data connection
- Setting up your own RTK base?


LL01
TABL
CJMG
FHOG
MSCG
KYVW
PPBF
DVNE
COTD
CACT
HNPS
P471
P505
P474
P486
GL
RAAP
P473
POTR
50 km
20 mi
Scale = 1 : 2M
-116.43419 33.49399


San Diego Conv. Ctr
X
P475
RTK base
5 km
2 mi
Scale = 1 : 216K
-117.17028, 32.76546


Washington State Reference Network
Current Puget Subnet
Current EWA Subnet
Current NW Subnet
Current SW Subnet
Current SE Subnet
Active - 100%
Active W/Glonass
Ready - 90%
Neogtiating - 50%
Reserve
BCSL
BCCG
BRNB
CWAK
SC04
BELI
SC02
CNCR
ROSS
VERN
MKAH
P403
P401
SC03
P402
PNCL
COUR
ARLI
DARI
CHCM
P437
WEEZ
PFLD
UFDA
SSHO
LSIG
QMAR
SMAI
SAMM
OYLR
NIMT
SNOQ
HAHD
ELSR
CUSH
QNLT
BILS
TACO
CSKI
ENUM
LNGB
OLMP
TAHO
PABH
P399
OCEN
MONT
TUMW
YELM
TILY
GRMD
CPXF
RYMD
IWCO
CATH
CROK
COUG
P414
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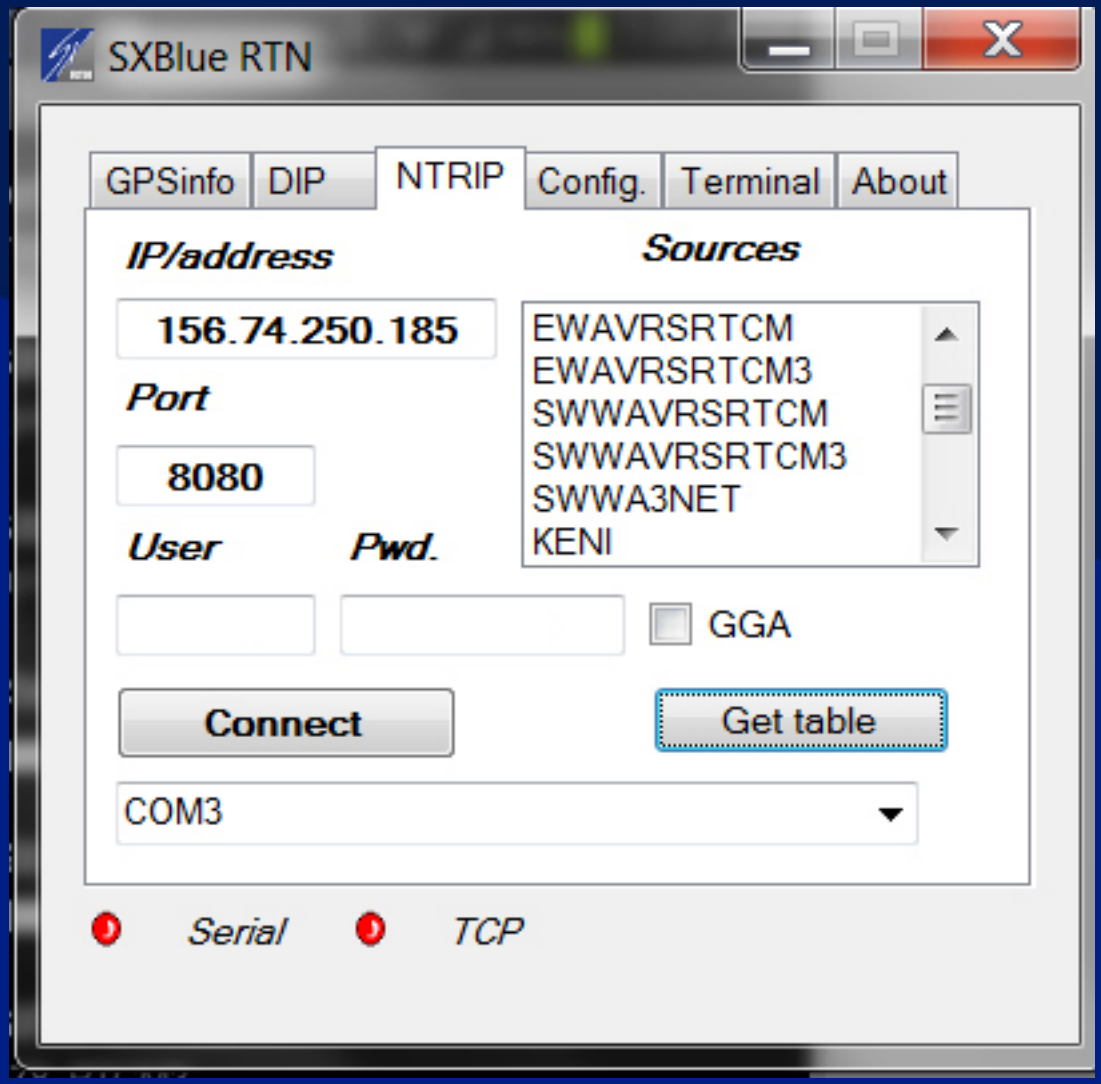
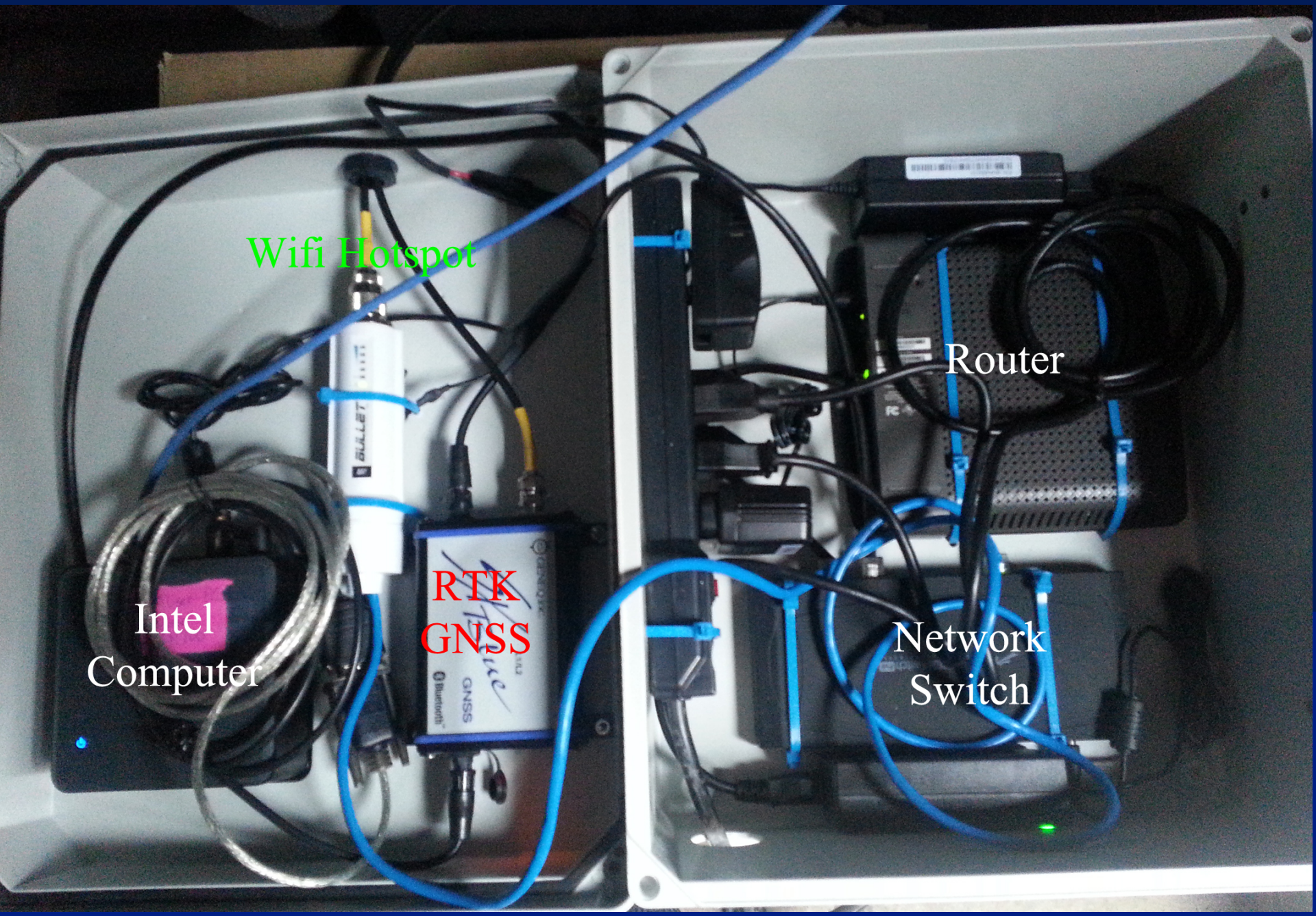
CPUD
EPHR
MSLK
SPRG
LTAH
DVPT
SPKN
SPKV
KOOT
BIGD
CHEL
STHK
WNTH
OKNG
OROV
RPUB
COLV
BDRY
P025
NINA
NWPT
GRCK
April 8th 2011
50 0 50 100 Kilometers
NOTE: Map only shows operational status.
For current status consult "Current Station Status"
on the www.wsrn.org website.

NTRIP Mount Points for WSRN



What you need to set up your own RTK base to broadcast via Internet

- RTK GNSS base receiver
- Basic computer to run NTRIP/DIP Server software (or some RTK receivers have the feature built-in)
- Reliable internet connection
- Optional network switch or router
- Power supply


Wifi Hotspot
Router
RTK
GNSS
Intel
Computer
Network
Switch

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