

# The IGS Network and ESA processing

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Analysis, Problems and Recommendations from  
an Analysis Center

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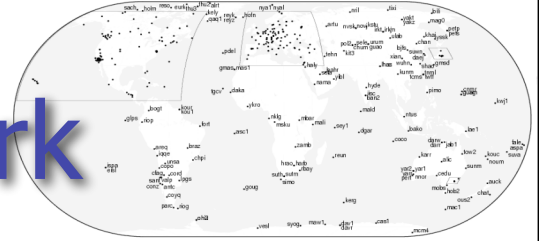
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# An AC and the IGS network



- As an AC we want to support the IGS network:
  - Providing feedback
  - Providing solutions (coords, clocks)
- Are the coord solutions advancing the GNSS ITRF realisation ?
- Can we improve the IGS network with more/ better feedback?

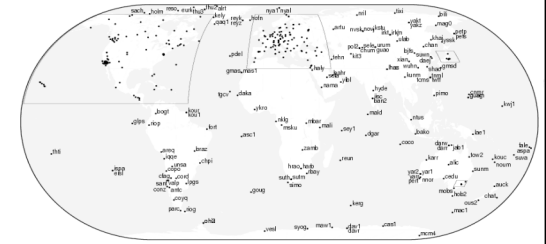
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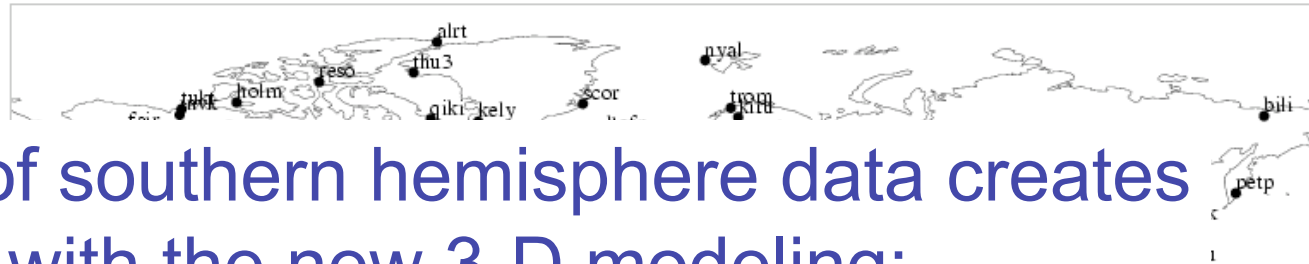


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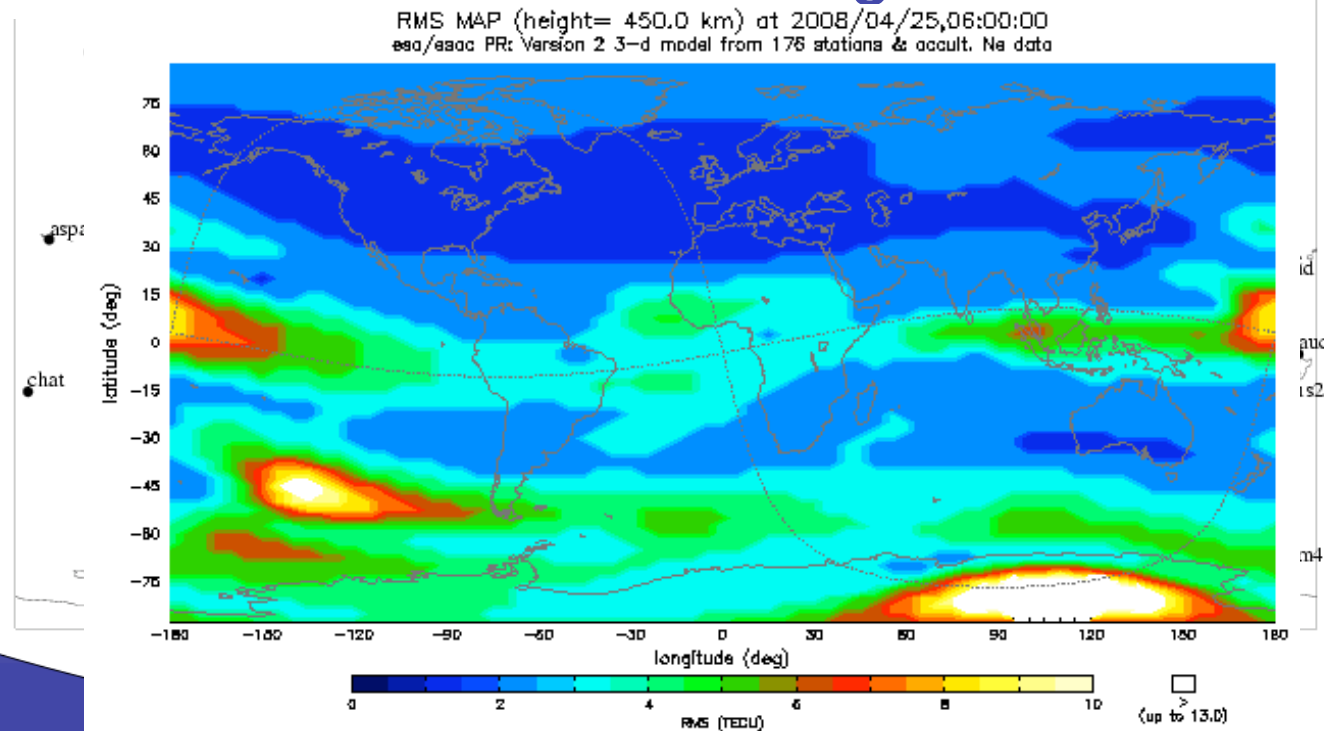
# ESA Iono Stations



- The heaviest data user is our Iono processing
- ~180 sta



The lack of southern hemisphere data creates Problems with the new 3-D modeling:

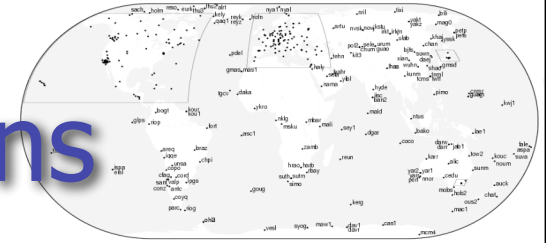


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# ESA Final Products' Stations



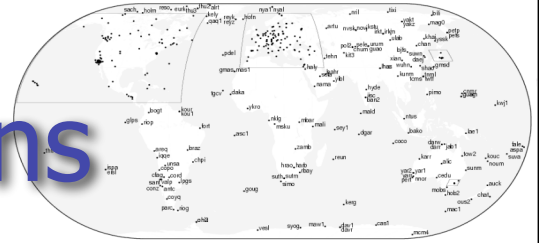
- We download and accept ~300 stations (Daily files)
- Resubmissions are handled automatically if the original file was missing epochs
- We pre-process about ~240 stations correctly configured in our DBs
- A few 'accepted' stations have "files" but no useful data:

KHAR		---	7	-----	88	-	9878789777689	-	8	-----	-	-----		
MAC1		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		
PETP		-	89	*	999898788666777768987779887897	-	9989	*	89	-	99	-----	666568786	-----
GODZ		887777887667677765			7776676987678874566888887788766887									-
GANP		9*9*8			8*988999888987778899		999	*	*	*	*	*	*	88988778899*9989889**999**9

- From the ~240 stations we pick 100 based on G+G criteria, preferred lists (IGS05, ESA) and geometric distribution



# ESA Ultra Products' Stations



- We download and accept ~210 stations per hour
- Resubmissions are NOT considered
- We pre-process ~195 stations as configured in our DBs
- Some stations have "files" but little useful data:

BARH	77 77 77 88 99 99 88 88 88 99 88 88 88 99 88 88 98 99 ** 99 98 77897 88
BDOS	87 99 87 76 66 98 77 99 88 ** ** ** 99 99 99 88 99 99 -6 99 99 ** 99 88
BOGO	77777899***9 9****8787877789999988 9*989***9899 **9987
KELY	77799*9*9*****89**
KHAR	- *9-99-88----- - - -
KIT3	7-----666665676565666687887887897
MAT1	8878866678887899986687888---567886888766 -
MATE	8888877789**9****988*99**-6667789788878-----8--9-----9-----9-----8-888
TSKB	**9
URUM	9**9999**77889*****9*****89*9998879777778888877 9*9
USUD	88878887777778*9899999*988999989877655566678866788779**88878998888*9
UZHL	66-886667 677-77 -5655 78888 89778898889-777-8877-77-776
WES2	77 66 76 88 88 99 77 99 77 88 88 77 99 88 88 77 88 88 99 88 88 87 88 77

- From the ~195 stations we pick 95 based on preferred lists (IGS05, ESA) and geometric distribution

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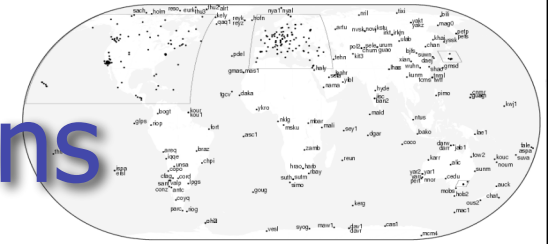
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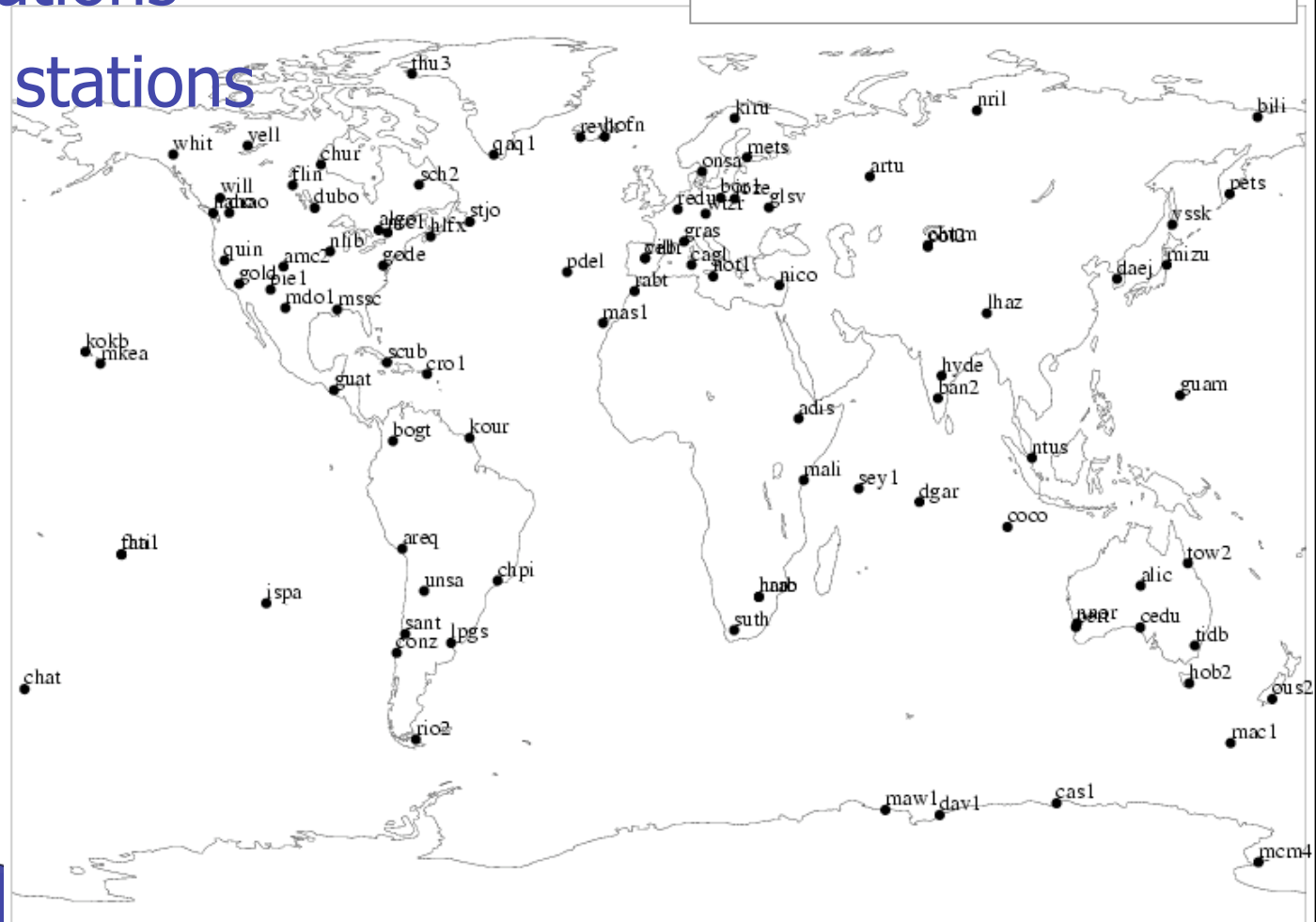


# ESA Ultra Products' Stations



- We use 95 stations per day (hourly files only):
- 97% IGS stations
- 80% IGS05 stations

ESA Stations used 08144



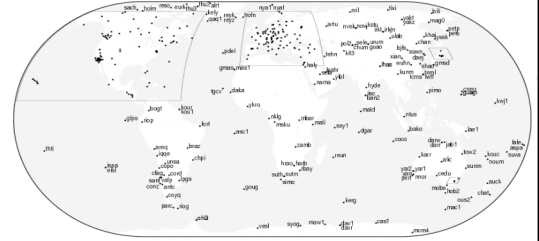
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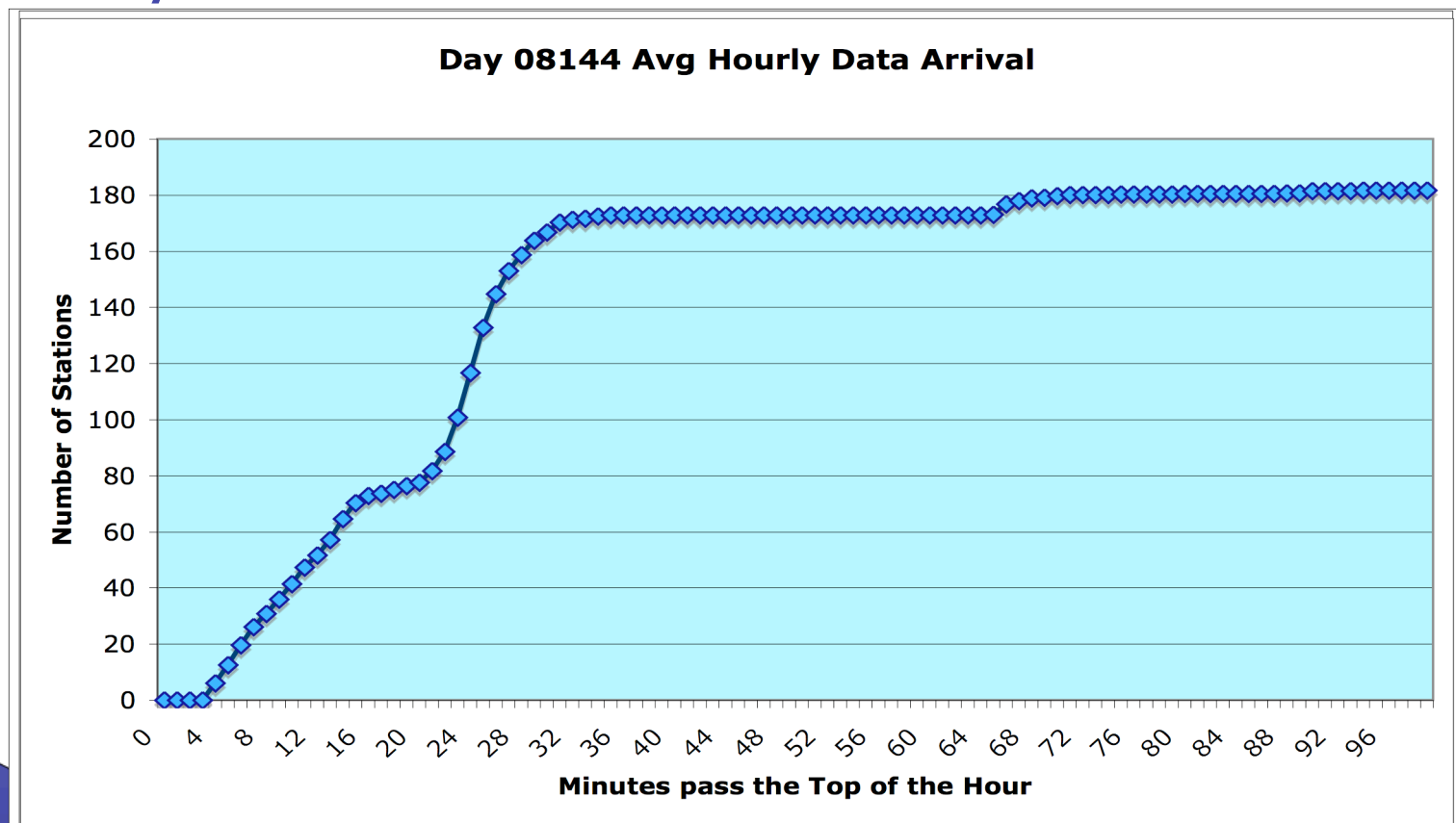




# Hourly Data Delays

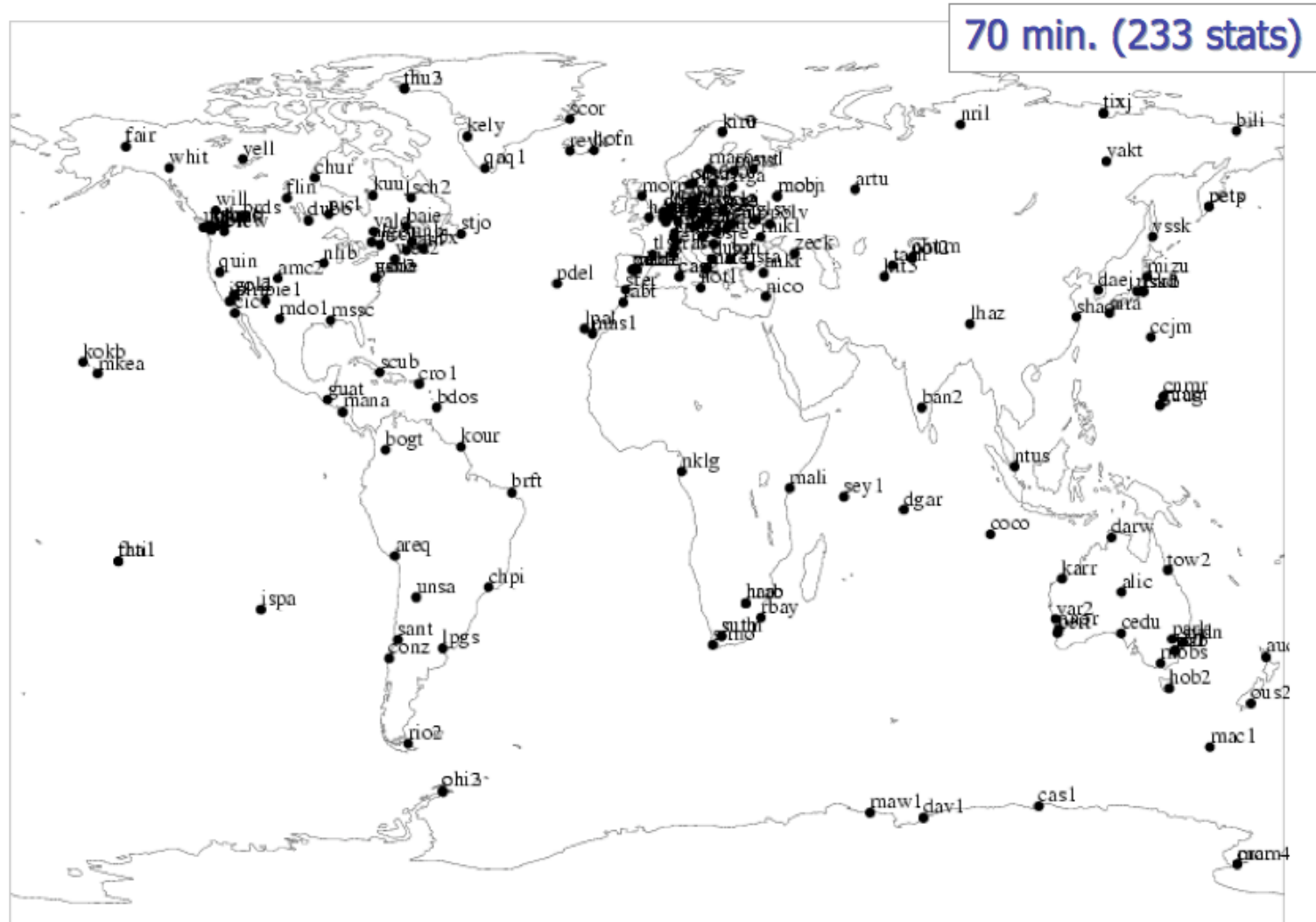
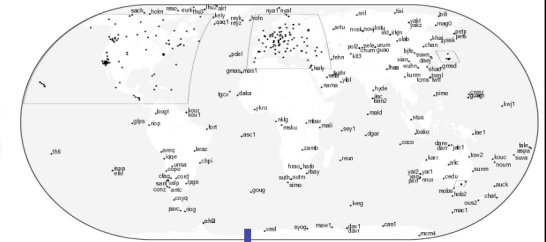


- The availability of Hourly Data is important especially for the “last” hour



# Hourly Stations Arrivals

- The arrivals are significant from 15' onwards

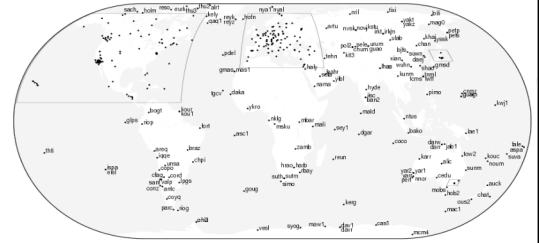


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# Residual Analysis



- analyzing the residuals (see ESOC station poster)  
... some interesting things with IGS stations ...

LC Residuals / WILL vs. IGS / Week 1476 / Finals

LC Residuals / KERG vs. IGS / Week 1476 / Finals

LC Residuals / SANT vs. IGS / Week 1476 / Finals

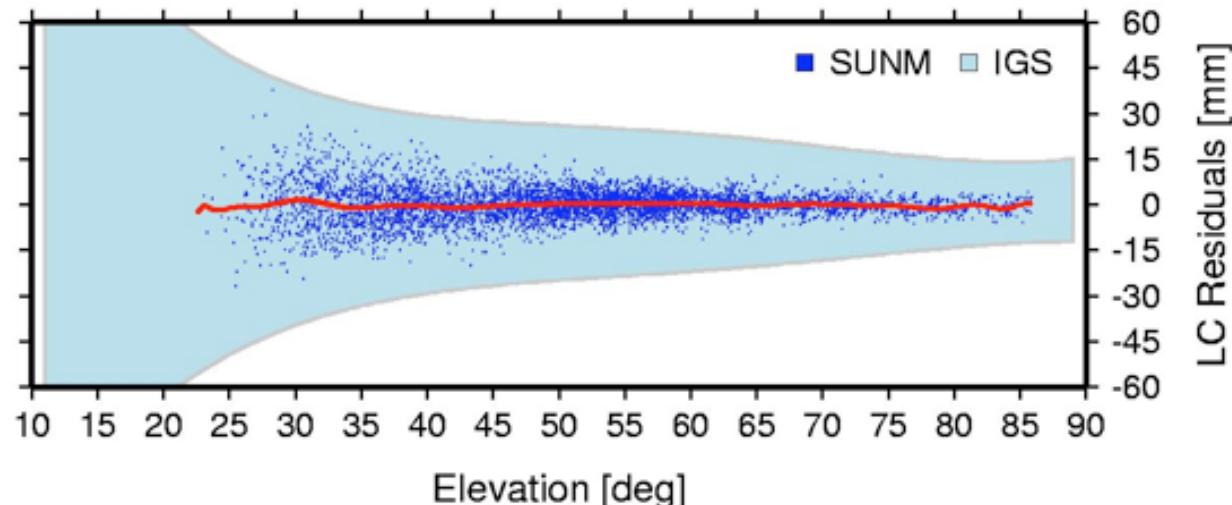
LC Residuals / SUTH vs. IGS / Week 1476 / Finals

LC Residuals / AMC2 vs. IGS / Week 1476 / Finals

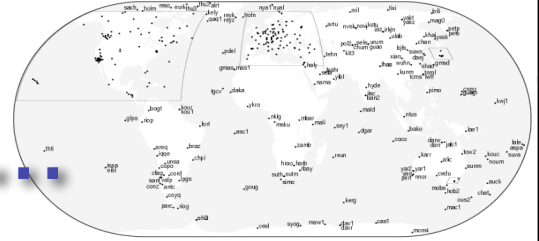
LC Residuals / SUNM vs. IGS / Week 1476 / Finals



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# We have some concerns ...



- RNX Header and logs (Station inconsistencies)
- RNX Headers which do not match the observables
- Antenna changes announced too late!
- Antenna+DOME combinations not in ATX (SCSI, EMRA, JPLA, etc)
- RNX Files without useful data
- RNX Files not there (i.e. WILL '93-'98)
- Incomplete RNX files (~20 per day < 95% epoch)

The station coverage holes don't fill themselves

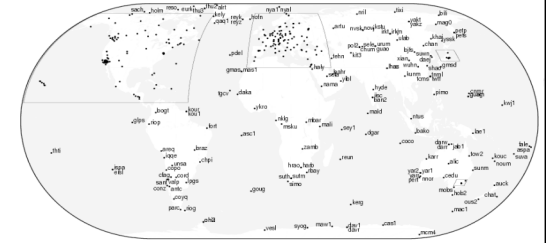
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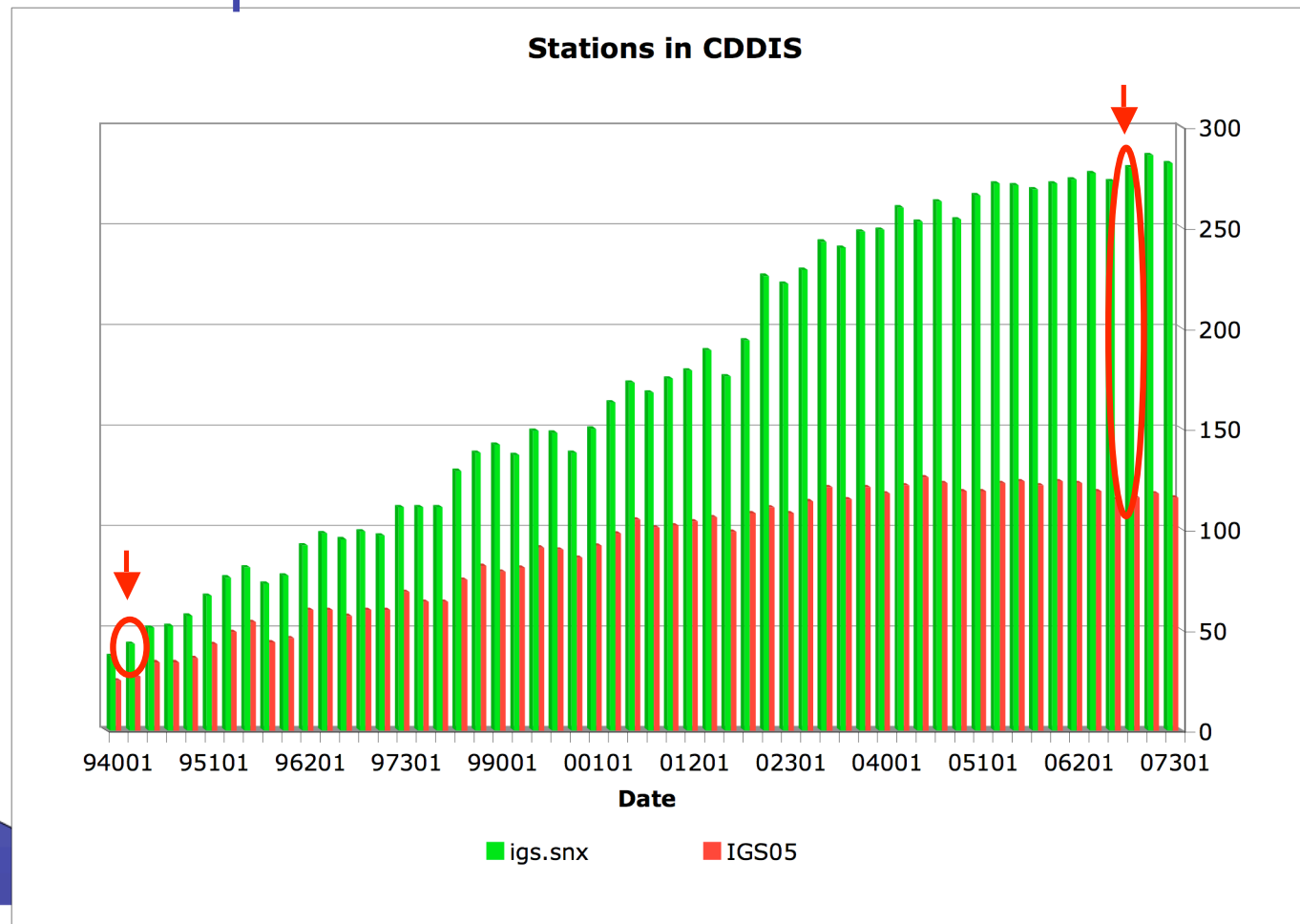


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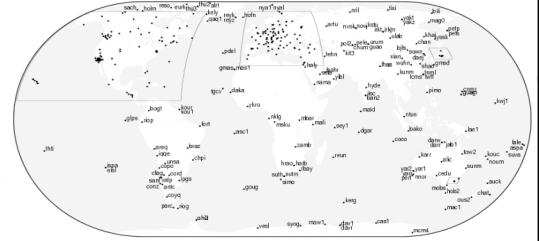
# IGS stations



- It is unfortunate that new stations have no impact on the IGS05 definition:



# From our perspective ...



1. ACs have the duty of providing feedback to the IGS network
2. ACs should coordinate this “feedback” activity, individual contacts are not as effective ... new “product line” ??

## IGS network:

1. Hourly resubmissions should be discouraged
2. Files need to have some validity/consistency check
3. The IGS should define critical world areas for speedy IGS acceptance (Africa, etc)
4. The IGS needs to approach station operators to ask for data or coordinate installations where needed.

... or ...

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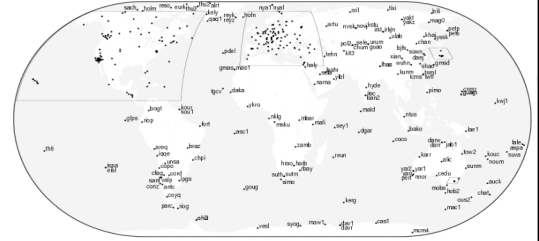
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# ... my Possible Future



- The IGS gets out of the network management
- We leave it to smaller “gatekeepers”: EPN, NRCAN, GFZ, JPL, ESA, etc
- IGS only sets standards and coordinates the “gatekeepers”
- Considering the huge number of stations available worldwide the original need to deal with individual stations is not there
- The IGS only encourages and supports densification (through contacts or installations)

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