



## Background

The Extended-NDC-in-a-Box (ENIAB) is an integrated data acquisition, processing and analysis platform for NDCs, which was developed by the IDC. ENIAB contains several software packages including SeisComP3 and Geotool. Here we describe our experience of implementation and adaptation of ENIAB at the Israel NDC.

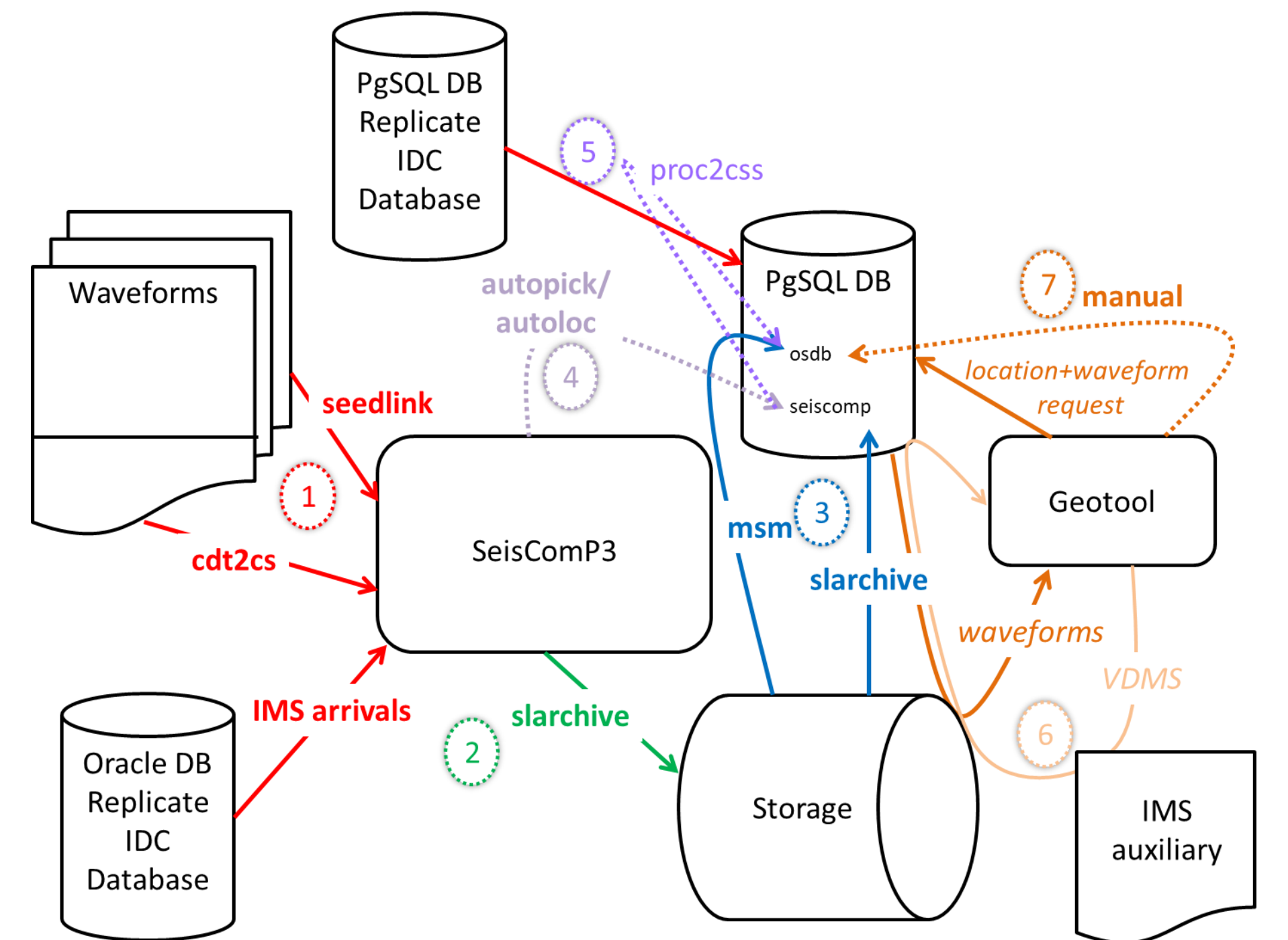
## Implementation of ENIAB

The Israel NDC has installed the ENIAB on three separate computers instead of as a single virtual machine. The package was divided so that one machine holds SeisComP3 (SC3), another runs Geotool, and the third holds PostgreSQL (PgSQL) databases.

### 1. Data Collection

Seismic data continuously streamed using *seedlink* from:

- Israeli IMS stations (EIL, MMAI),
  - Israeli CNF (Cooperating National Facility), stations, Israel network stations,
  - Several IMS primary stations obtained from IMS, (currently, data volume is restricted) using *cdt2cs*
  - IRIS and GEOFON stations.
- ⇒ Total volume ~1.7 GB/day, from 240 seismic stations.
- Replicate of IDC database into PostgreSQL database (We acknowledge support from Gleb Kuzmenko of the PTS)
  - Arrivals from all primary IMS stations are imported into SC3 from replicated IDC database.



### 2+3. Waveform archival

*Slarchive* archives data in storage, and saves pointers at SC3 PostgreSQL database. *Msm* maps pointers in *osdb* database serving *Geotool*. This is performed automatically. Static data (i.e. station locations & response files) is archived in SC3 database, and is updated in *Geotool* static tables by manually running *inv2css*.

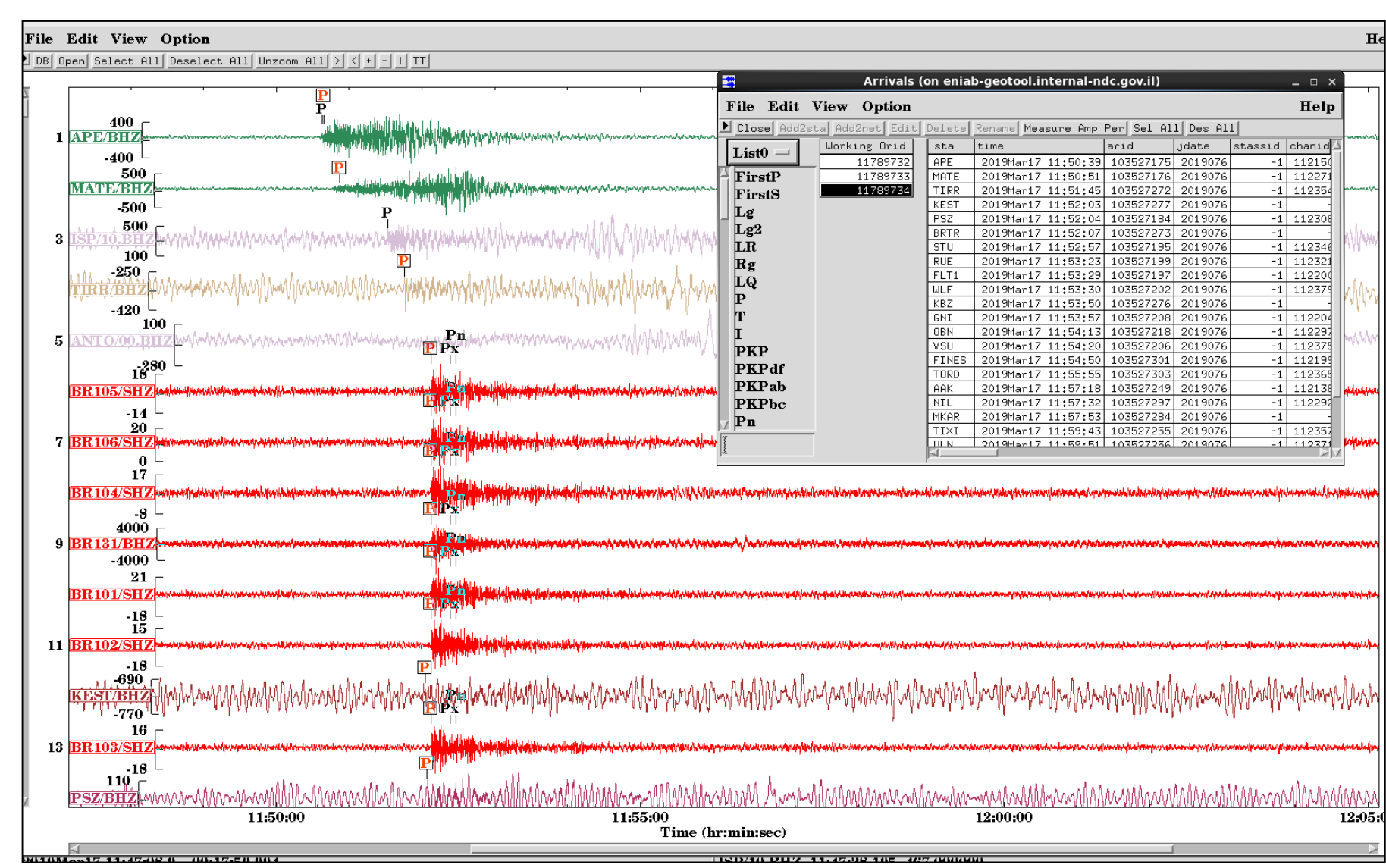
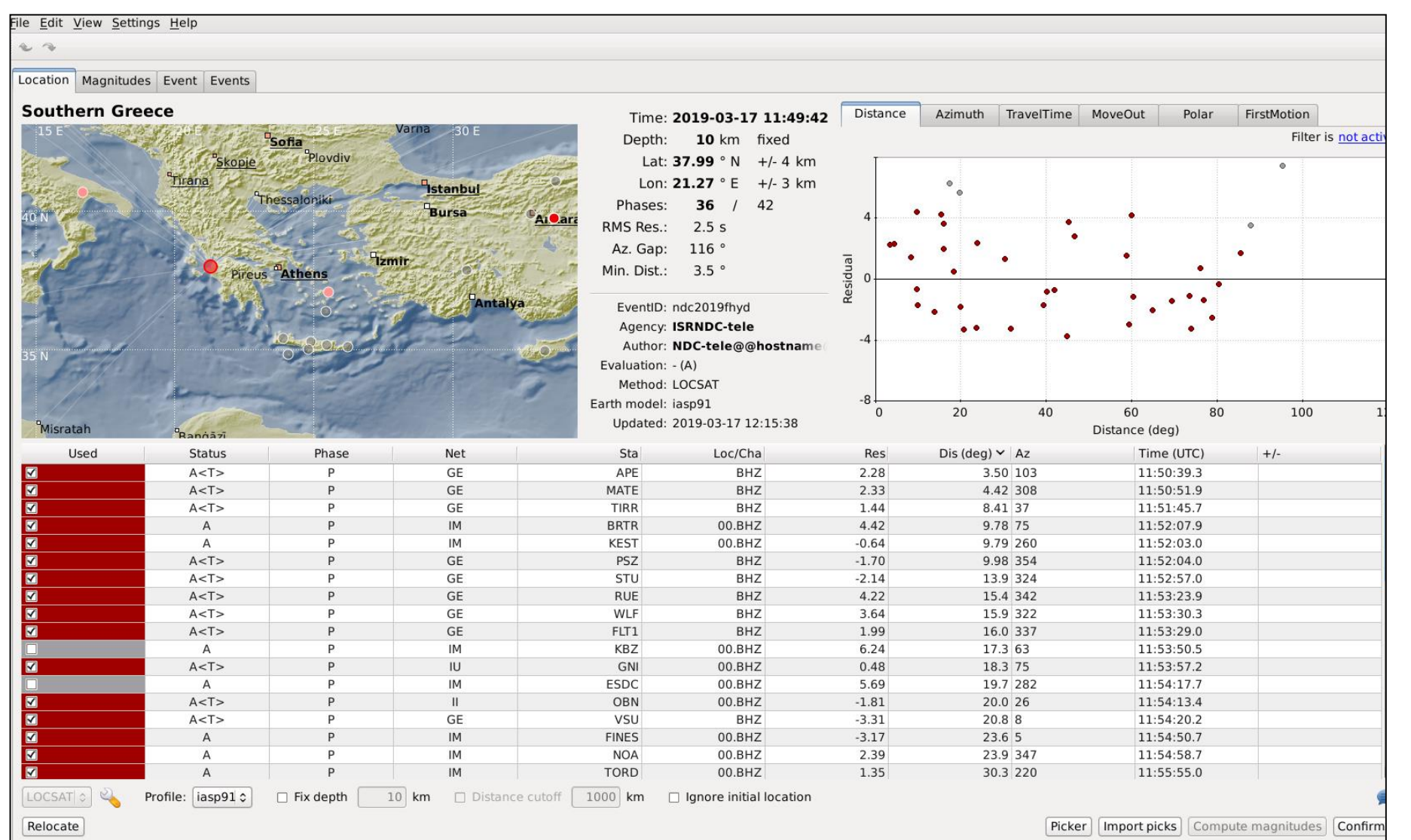
### 4+5. Metadata Production and archival

Automatic location using SC3's *autopick* and *autoloc* produces metadata (locations, arrivals etc.) stored in SC3 database. These are copied to *osdb* database using *poc2css*.

### 6+7. Manual location using Geotool

Analyst start out with SC3 initial locations. These can be refined using data requested from more IMS stations (especially auxiliary stations) using *VDMS*.

### Automatic location by SC3

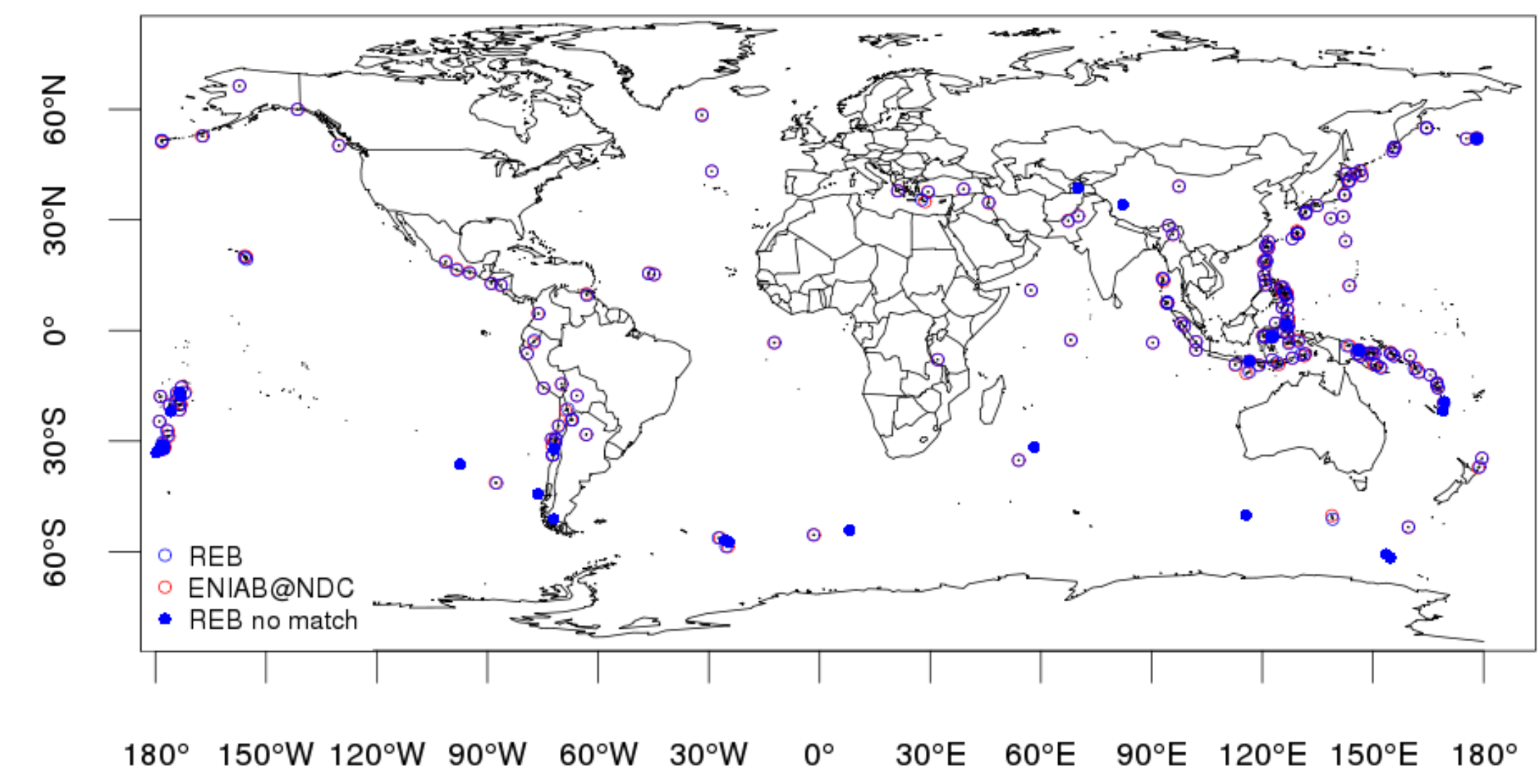


Same event, in Geotool

## Preliminary Performance Assessment

Assessment was based on data of ~30 days, during the first half of 2019.

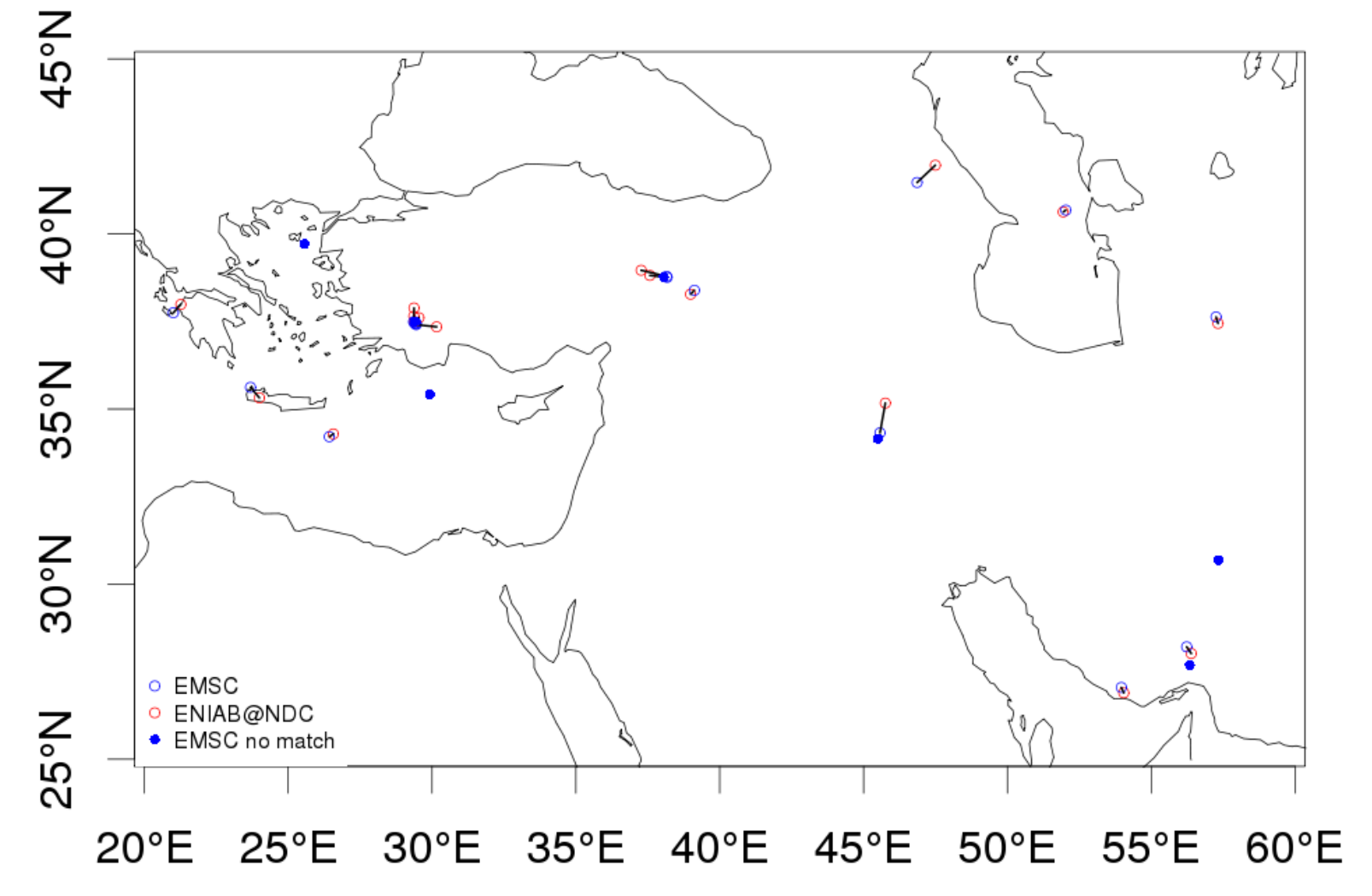
### Global Events



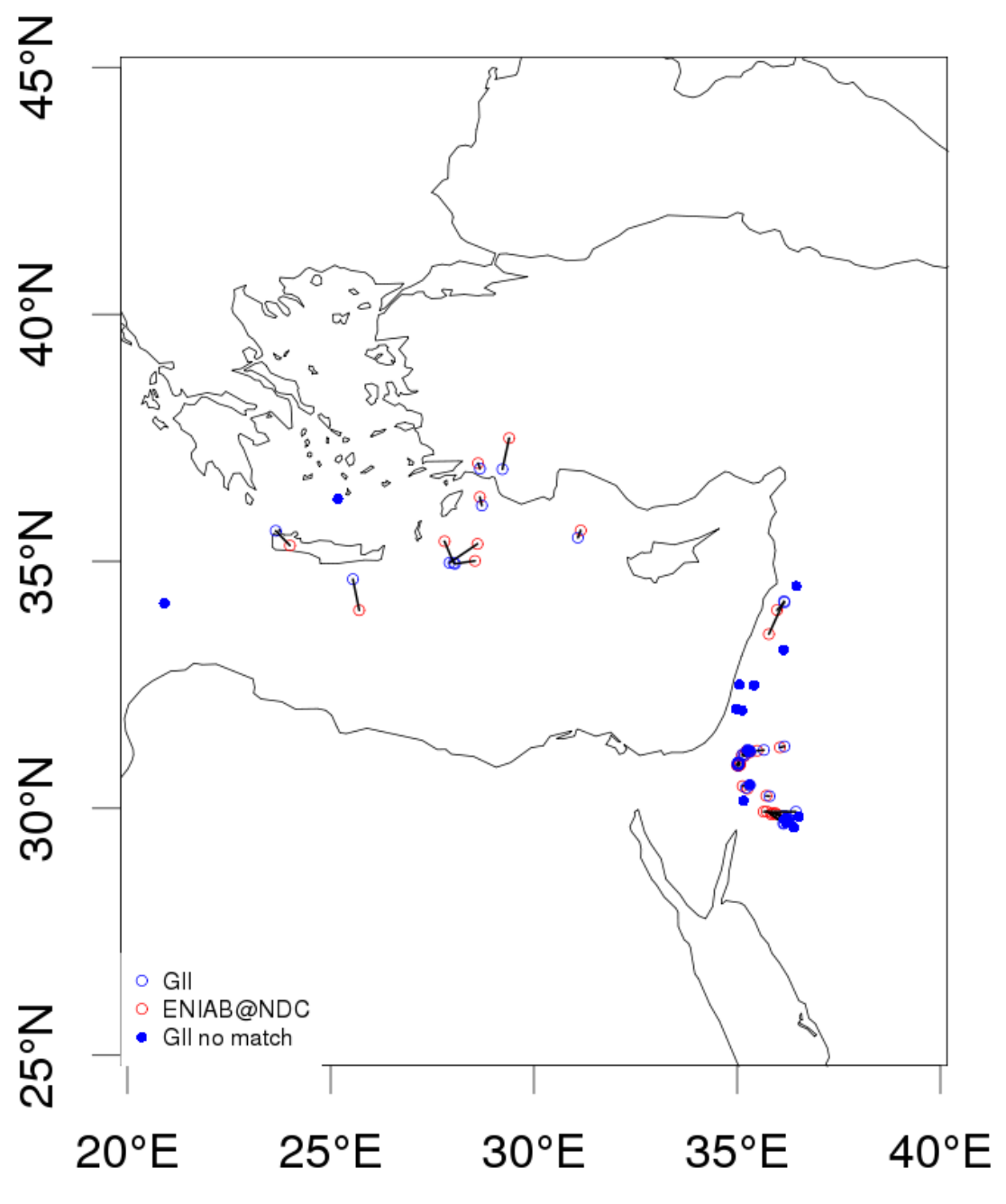
In the test period 187/228 (82%) of REB events\* with  $m_b > 4.5$  were automatically located by SC3.

### Mid-Range

During the test period 17/24 (70%) of EMSC events\* with  $m_b > 4$  were automatically located by SC3.



### Local Events



37/55 (67%) GII (Geophysical Institute of Israel) events\* generated by with  $m_d > 1.5$  were automatically located by SC3.

\*Matching criteria: difference in time 60 sec, difference in location 1°.

### Further work

1. Use IDC arrival azimuth / slowness in location process,
2. Reduce minimal number of defining stations (currently 6/8),
3. Configure stations individually (i.e. filter, detectors etc.),
4. Introduce s-picker.