

GEODAC: a WEGENER project

GEODAC mission

- GEODAC is being primarily designed to serve the WEGENER community who is mainly concerned in having velocity field maps derived both from permanent or campaign data, obtained by applying the most up-to-date geodetic corrections and processing techniques.
- GEODAC intends to be a nucleus for the development and implementation of the latest analysis techniques to provide high quality solutions and products directed in particular to the needs of the Earth science community.
- Computation and analysis of time-series of GPS data (Permanent and Campaign stations).
 - Not restricted to positions but also including other geophysical parameters.

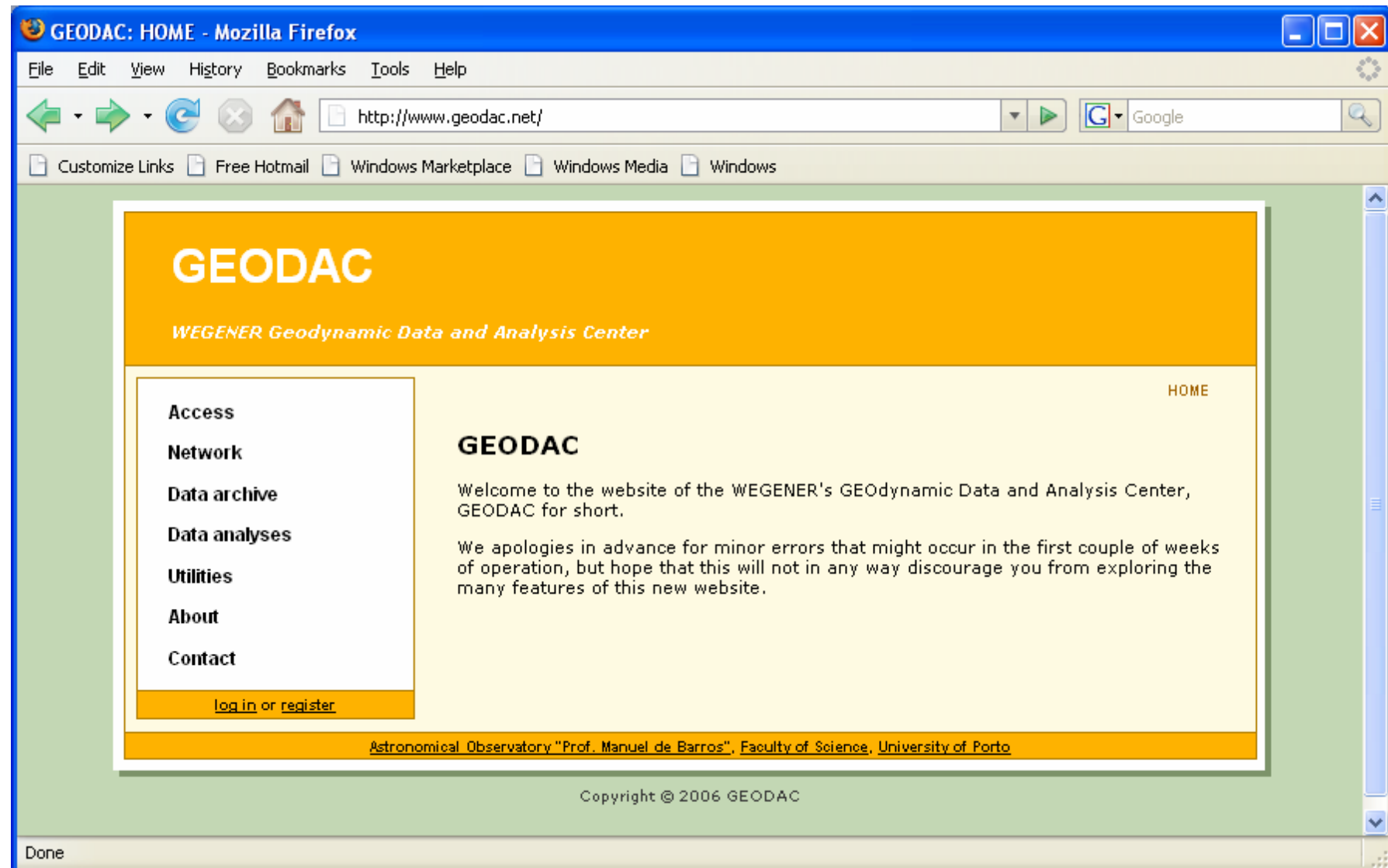
Current Status

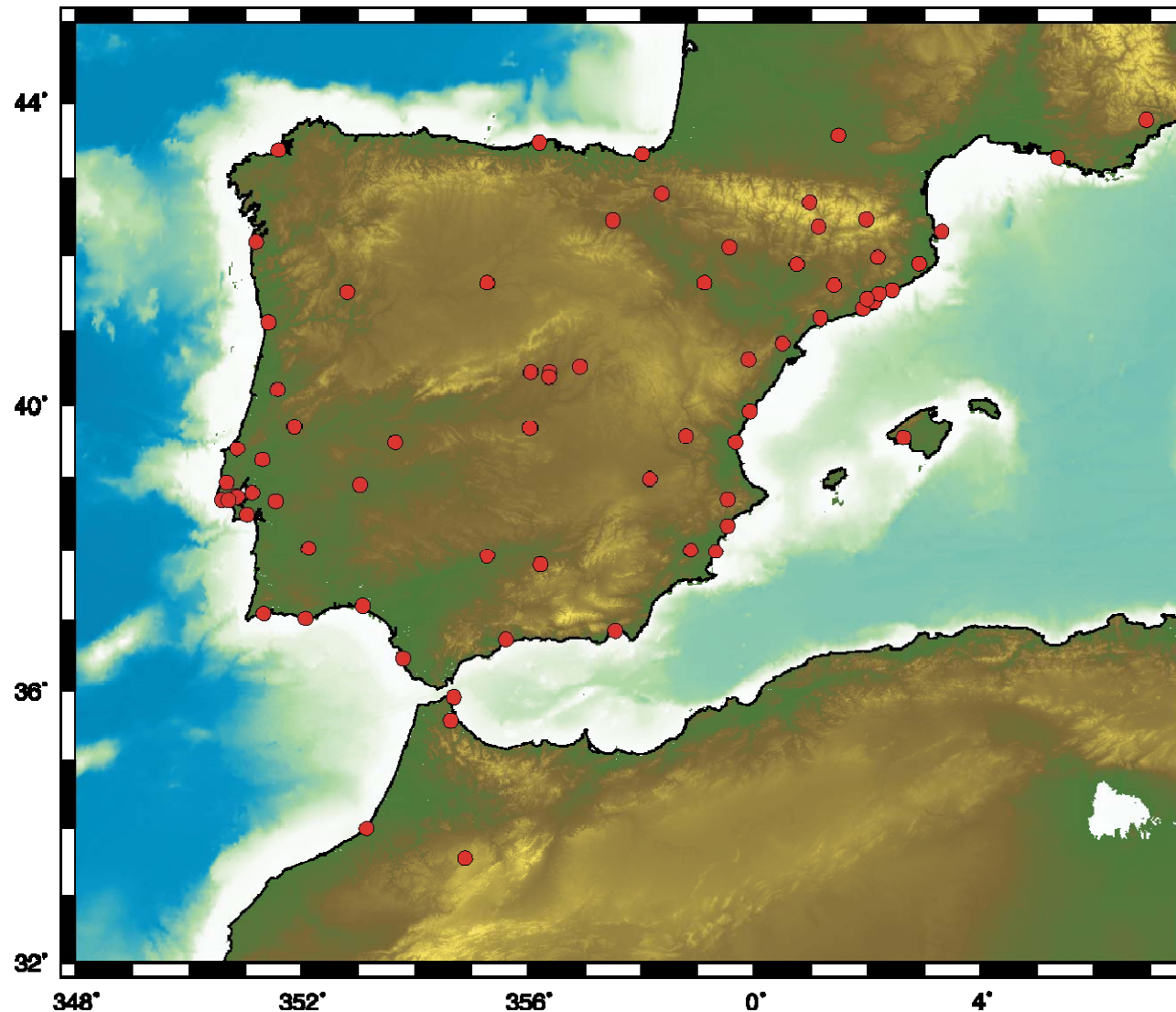
- Web Portal already online (not officially):
<http://www.geodac.net>
- For the initial phase of implementation of this service, the Ibero-Moroccan segment of the Eurasia-Nubia plate boundary was selected.
- Regular computation of time-series of:
 - Positions
 - Precipitable Water Vapour
 - Atmospheric Loading
- Regular Analysis of Power Spectra of GPS residuals

GEODAC

WEGENER Geodynamic Data and Analysis Center

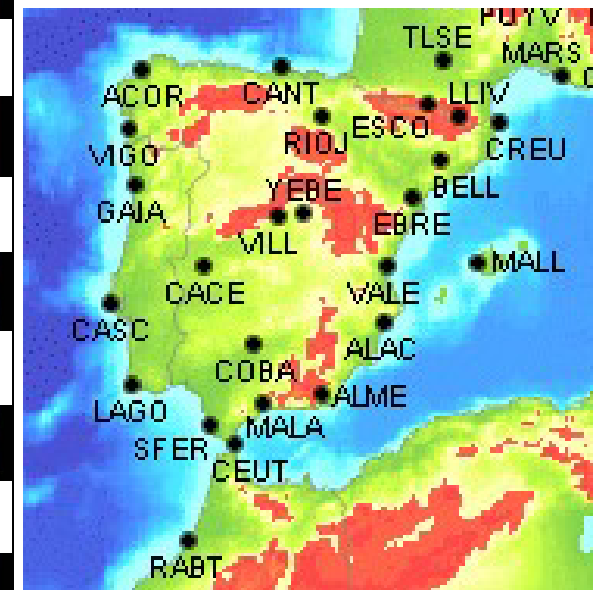
<http://www.geodac.net>



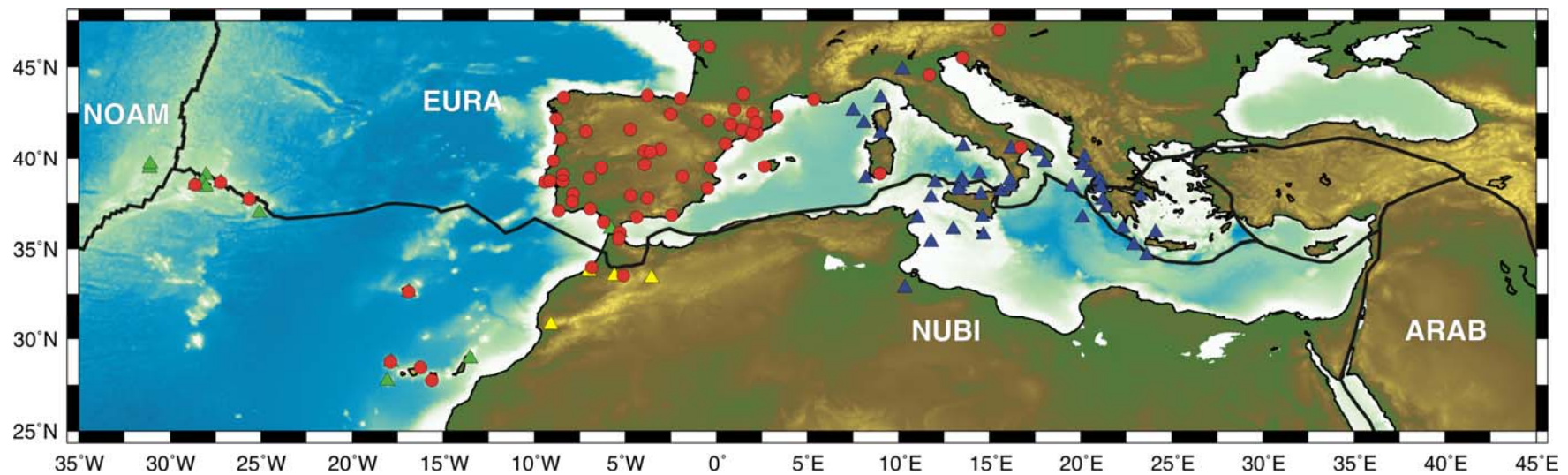


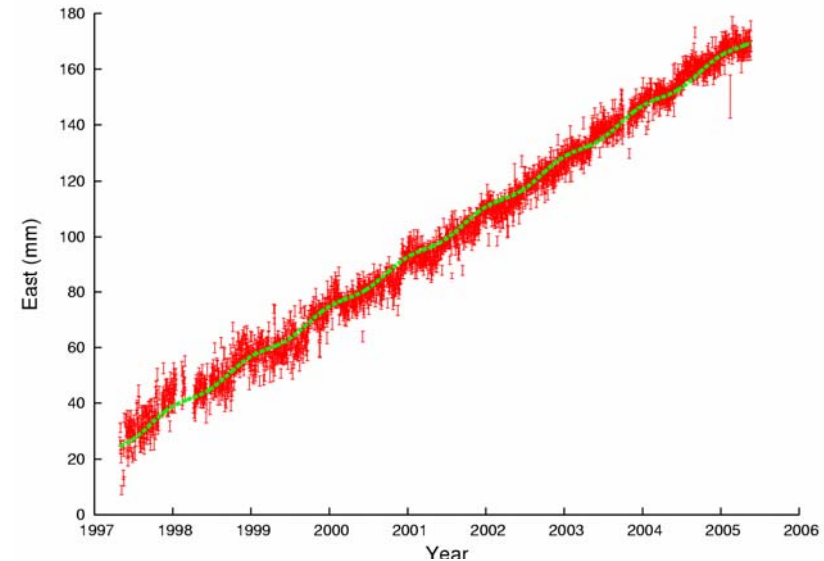
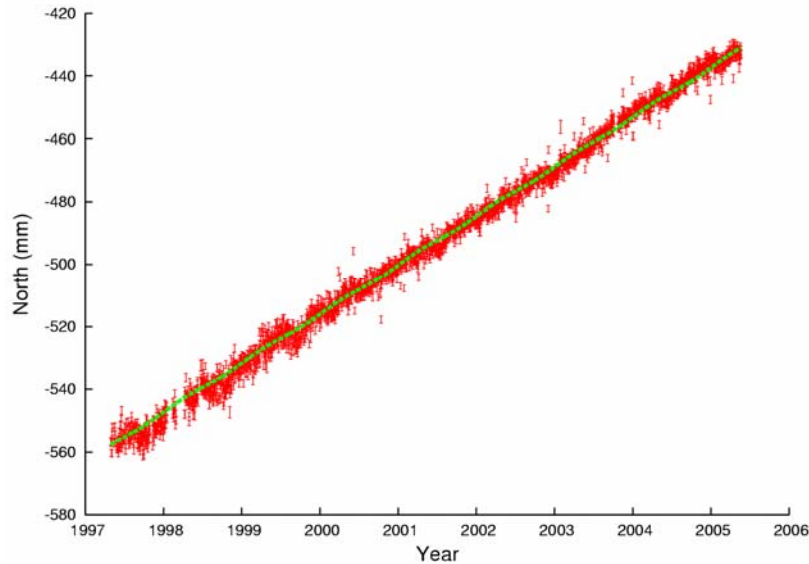
72 permanent stations

26 EUREF sites



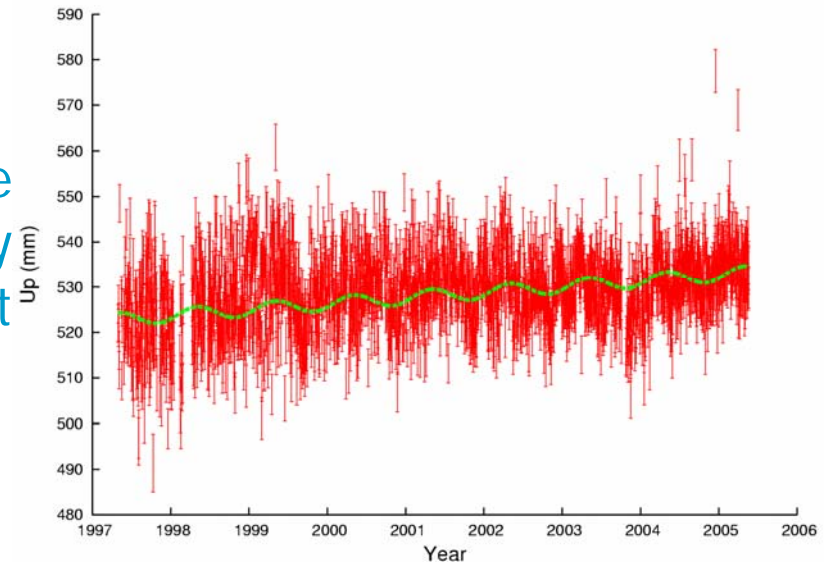
Permanent (circles) and Campaign (triangles) Data

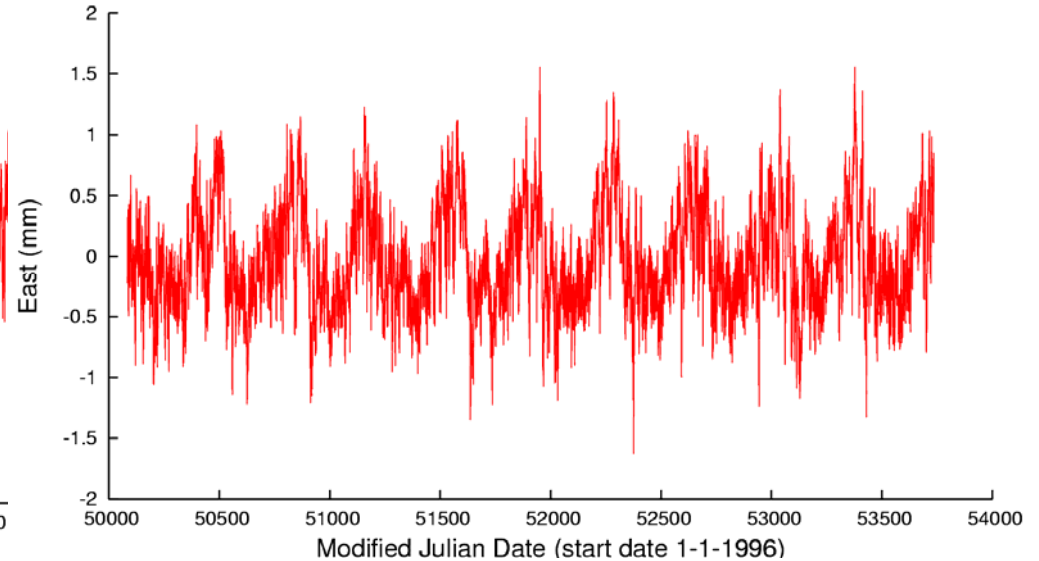
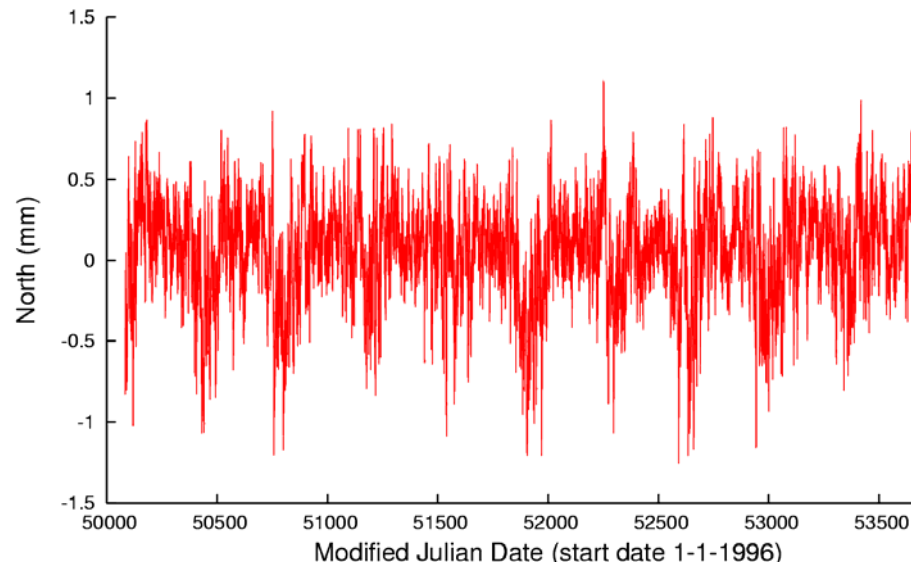




- Example: CASC

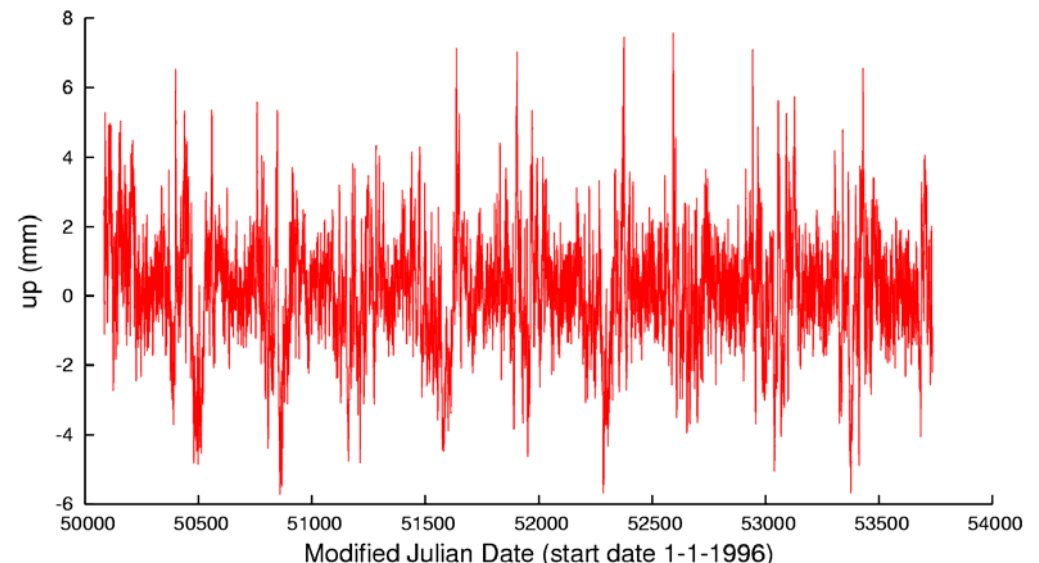
Simultaneously estimation of the secular motion, yearly (and sub-yearly if desired) signals, and offset corrections using dedicated software.

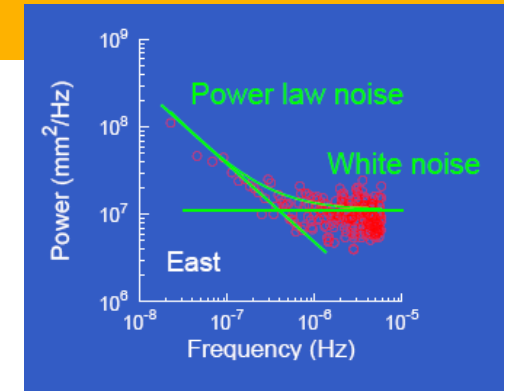
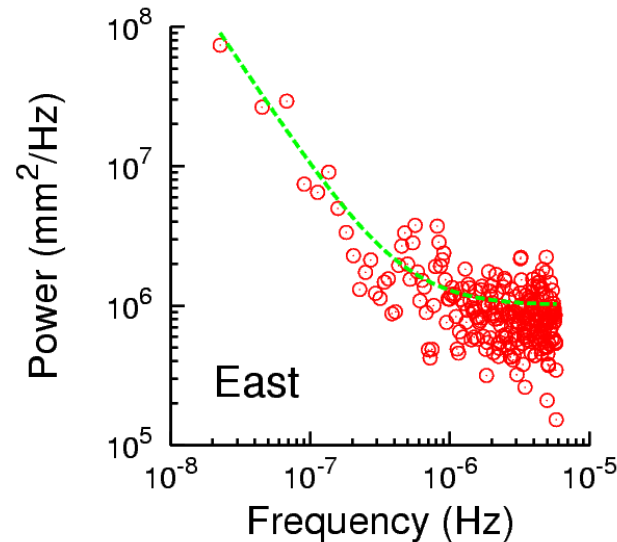
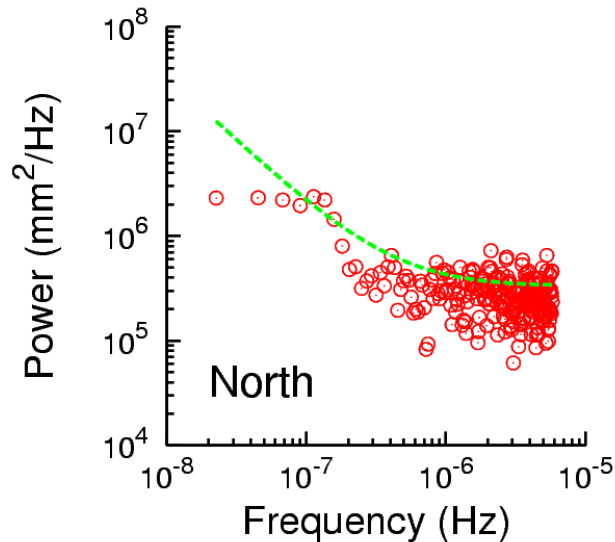




- Example: SFER

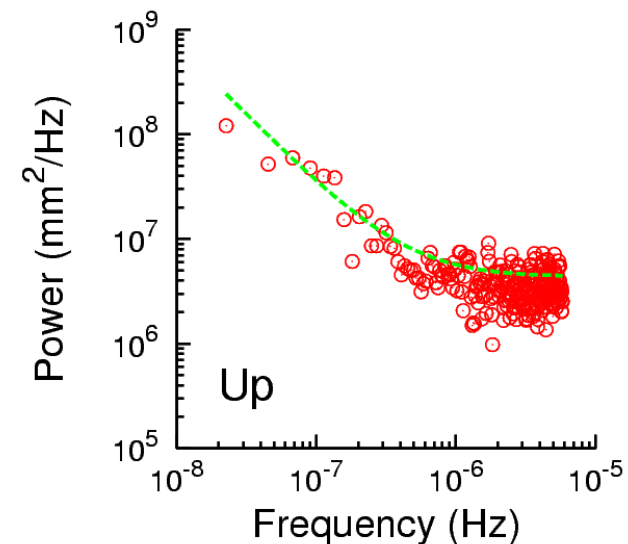
GEODAC uses dedicated software and if requested can provide results for stations not computed by SBL (Special Bureau for Loading, <http://www.sbl.statkart.no/>).





- Example: GAIA

Modified CATS version to compute error ellipses implemented in collaboration with S. Williams (several times faster - allowing efficient analysis and reanalysis of high number of stations, etc..).



Improvement of associated uncertainties

TERC, Azores

	East	North	Up
Least-Squares (<i>mm/year</i>)	17.14±0.07	16.25±0.15	0.70±0.26
Maximum Likelihood (<i>mm/year</i>)	17.57±0.98	16.20±0.36	0.73±0.68
spectral index	-0.56	-0.45	-0.28
powerlaw noise $\sigma_{pl}(mm)$	1.06	0.70	3.17
white noise $\sigma (mm)$	1.08	0.97	2.02

Power spectra analysis
– Time correlation

SITE	Data span (years)	$V_N \pm \sigma_N$ (mm/yr)	$V_E \pm \sigma_E$ (mm/yr)	$V_U \pm \sigma_U$ (mm/yr)
CASC	8.3	15.7 ± 0.3	18.0 ± 0.6	1.2 ± 0.4
CEUT	3.6	16.2 ± 0.7	15.7 ± 1.3	1.0 ± 3.0
EBRE	9.4	15.1 ± 0.4	20.1 ± 0.5	-0.4 ± 0.3
GAIA	8.1	15.7 ± 0.3	18.8 ± 0.8	1.1 ± 1.4
RABT	5.1	16.8 ± 0.6	16.9 ± 1.1	-0.3 ± 2.1
SFER	6.6	15.9 ± 0.3	14.9 ± 0.6	0.5 ± 1.1

Interaction with EUREF

GEODAC can contribute by providing time-series solutions for local networks using campaign and permanent data.
(Already being done with specific groups in Iberia and North Africa)
(GEODAC will directly contribute for the TOPO-EUROPE project)

**Through GEODAC,
WEGENER is willing to fully cooperate with EUREF
by
providing and/or integrating services in these
different fields.**