New Dawn of Truth

the London Conference at Conway Hall
September 8 and 9, 2016
on

Climate Change:
Science & Geoethics

The Conference Volume:
Extended Abstracts & Commentary Notes

Nils-Axel Mörner
editor

uploaded on ***ResearchGate***, August 2016

This Conference

is organized by the Independent Committee on Geoethics (ICG)

It will be held at Conway Hall, Red Lion Square, London
https://geoethic.com/london-conference-2016/

on September 8 and 9, 2016
(09.00 to 17.00)

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Welcome to join us at this milestone event

Day 2: Friday 9 September 2016

(*Keynote presentations)

08.30 mingle and uploading of ppt-files
08.50 Welcome and information

Session 4: The greenhouse effect and anthropogenic global warming

09.00 Jan-Erik Solheim: *Result of a greenhouse experiment*
09.20 Francois Gervais: *Tiny CO2 warming challenged by Earth greening*
09.40 Piers Corbyn: *The total failure of the ManMade Climate Change story*
10.00 Discussion

10.10 Tea and coffee

10.30 Albrecht Glatzle: *Reconsidering livestock's role in climate change* *
10.50 Pamela Klein: *Is climate science serious?*
11.10 Benoît Rittaud: *Epistemology of Climate Change*
11.30 Thomas Wysmuller: *Sea-level rise and CO2*
11.50 Discussion

12:00–13.00 Lunch

13.00 Maria Araujo: *Sea level data in the Iberian Peninsula*
13.20 Nils-Axel Mörner: *Modelled vs observed sea-level changes*
13.40 Discussion

Session 5: Implications of the catastrophist anthropogenic global warming hypothesis

13.50 Madhav Khandekar: *Climate change and extreme weather: projection, perception and reality* *
14.10 Philip Foster: *Climate policy, geoethics and the developing nations*
14.30 Christopher Monckton of Brenchley: *Genocidal climate science* *
14.50 Discussion

15.10 Tea and coffee

Session 6: General discussion

15.30 General discussion, conclusions and communiqué

17:00 End of Day-2 program, end of Conference

Sea level data for the Iberian Peninsula

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Coastal erosion is a real problem along several stretches of the Portuguese coast. The causes are quite complex and the effects in the coastline are also differentiated. Some scientists (Dias *et al.*, 1997) insist that only 10% of coastal erosion in Portugal can be related to sea level changes. It is known (Ferreira *et al.*, 2008) that the most important cause has to do with the retention of sediments at the dams along the main rivers. Recent papers also conclude that the erosion areas are generally related to human intervention along the coastline (Lira *et al.* 2016).

However, most of the literature points out “sea level rise” as the primary reason for coastal erosion. Some of the recent papers on the subject don’t talk about sea level change but about sea level rise (SLR). Or even “ASLR” (Accelerated Sea Level Rise).

So, our first objective is to try to understand if this “acceleration” of sea level change really exists.

Unfortunately the Permanent Service for Mean Sea Level (PSMSL) has no recent data from Portuguese stations. So, it is quite hazardous, with the current available data, to evaluate the presence or absence of any recent acceleration on Portuguese coast. Consequently, we tried to study all the PSMSL stations in Iberia (Table I).

	Trend	Years		Trend	Years
AVERAGE	**1,03**	**31,11**	HUELVA	2,98	18
PASAGES	4,39	16	BONANZA	4,72	22
BILBAO	2,98	22	CADIZ II	1,41	109
SANTANDER I	2,21	73	CADIZ III	3,74	55
SANTANDER II	-4,09	12	TARIFA	1,10	72
SANTANDER III	1,93	22	TARIFA 2	-11,84	5
GIJON II	1,14	19	ALGECIRAS	0,37	59
FERROL 2	10,69	8	ALGECIRAS 2	-7,48	5
LA CORUNA I	2,43	73	ALGECIRAS B	3,94	9
LA CORUNA II	0,72	43	GIBRALTAR	0,30	53
LA CORUNA III	3,43	22	MALAGA	0,78	70
VILLAGARCIA	4,97	18	MALAGA II	3,02	22
VIGO	2,18	73	MOTRIL 2	1,39	10
VIGO II	2,38	22	ALMERIA	0,32	20
PORTUGUESE STATIONS			ALMERIA 2	2,38	9
VIANA	5,11	7	CARTAGENA	-0,64	11
LEIXOES	0,52	40	ALICANTE I	-1,13	45
AVEIRO	-1,21	21	ALICANTE II	-0,10	38
CASCAIS	1,33	112	GANDIA	0,17	7
LISBON	0,56	14	VALENCIA	5,42	21
SETROIA	1,48	21	SAGUNTO	2,00	7
SINES	1,35	15	BARCELONA	6,61	22
LAGOS	1,59	91	L'ESTARTIT	4,12	25

Table 1: PSMSL stations in Iberia: calculated trends and length of series.

There are great discrepancies in Iberian stations. Some of them even show an apparent lowering sea level. This must be related to:

1 - The length of the series.

2 - Possible problems in the acquisition of data in very short series: they are the most prone to show big oscillations in stations that are quite close and even carry the same name (e.g.: Tarifa, Algeciras, Almeria).

3 - The situation of the tide gauge stations: some of them are located near tectonically active areas (Cantabrian-Pyrenees, the Baetic System and the Iberian cordillera).

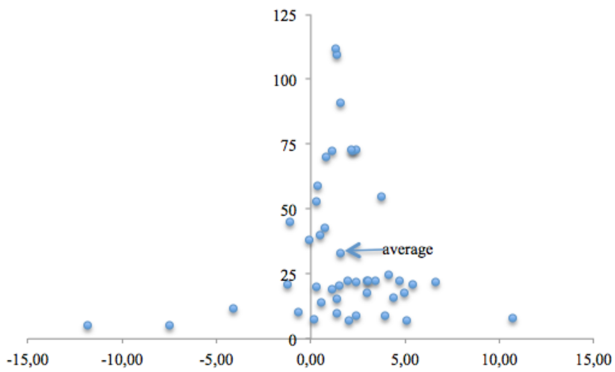

Figure 1: Relationship between trends (horizontal axis) and length of series (vertical axis).

Regardless of the tectonic situation of tide gauges, the length of the series seems to have great implications for the trends in Iberia. In fact, we know that sea level trends are only valuable if they are longer than the lunar cycle of 18,6 yrs. The series longer than the average (fig. 1) have smaller trends. The series shorter than 25 years show a great irregularity in their calculated trends.

We calculated the averages of series longer than 18,6 and 60yrs. They are quite similar:

Mean Iberia stations, series>18 year	1,92
Mean Iberia stations, series>60 year	1,63
Atlantic Iberia stations, series>18 year	1,89

Only 3 stations (in 18) have trends above 3mm/yr. Most of them are quite near the average (*ca* 1,9mm/yr). The 8 series more than 60 years long have an average of 1,63.

The main question subsists: is there acceleration in sea level change in recent years? As PSMSL doesn’t present recent data for Portuguese stations we have tried a further analysis with the Spanish ones.

Figure 3 shows that there are 5 Spanish stations with longer than 70yrs series. We divided the data at these 5 stations into 2 periods: till and after 1995. In the Atlantic coast, Vigo has a curious behavior: the trend after 1995 is negative. All the other stations have a greater trend in the last 20 years. The results for Tarifa and Malaga are a bit strange: before 1995 an apparent lowering of sea level, after 1995, a 4mm/yr. positive trend. May be it is worthy to analyze a little deeper the Coruña data because it has a more “normal” behavior and it is situated in an area where recent tectonics is not indicated.

As we said before, Vigo station has quite “anomalous” results. However they must not be forgotten because Vigo is very near to Portuguese coastline, where the data after 1993 are not available in PSMSL. The results can be seen on figure 4. Even if the last part of the data is difficult to compare with the beginning of the series, there is no acceleration of “sea level rise” in Vigo, on the contrary.

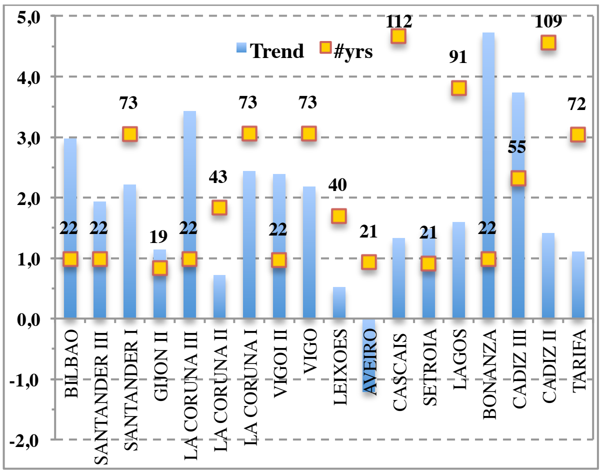

Figure 2: Iberian Atlantic stations: series longer than 18yrs.

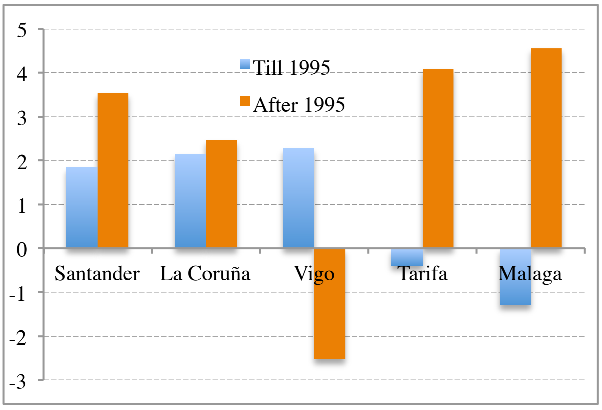

Figure 3: The Spanish stations with series longer than 70 years: trends before and after 1995.

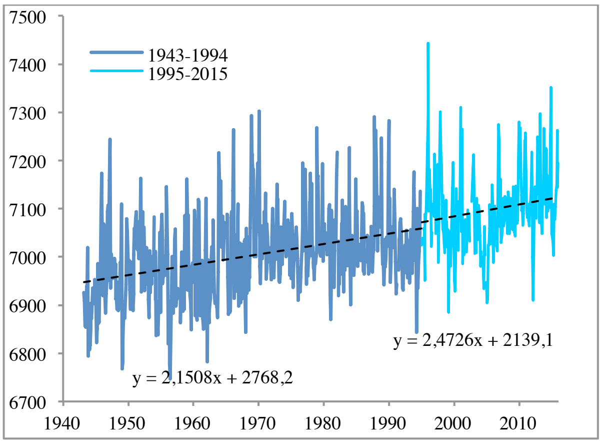

Figure 3: PSMSL data for Coruña: trends before and after 1995. From 1943 till 2015=2.43

Some Portuguese stations have long series (Cascais, 112yrs and Lagos, 91yrs). However, in both cases, the PSMSL doesn't publish the most recent data, so we must rely only on the PSMSL data older than 1993.

The data for Lagos is very discontinuous. So we will present only the Cascais data.

This is the longest PSMSL series in Iberian Peninsula. However, Cascais series is not continuous. There are several breaks in it. It seems that 1954 represented a change in the tide gauge conditions that may have affected the series after it (Silva *et al.*, 2008).

The observation of Cascais data shows clearly a lowering section of the curve around 1920. After 1960 and during 33 years, we have almost stability.

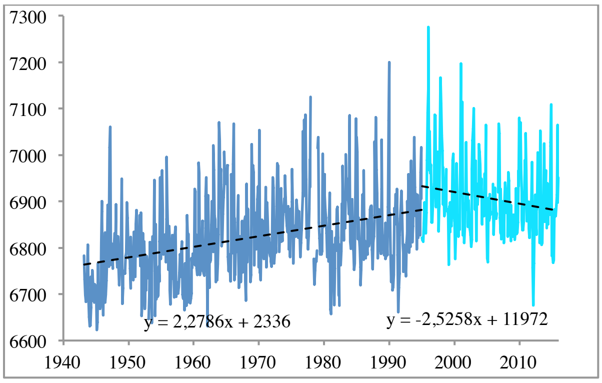

Figure 4: PSMSL for Vigo: trends before and after 1995. From 1943 till 2015, trend=2.18

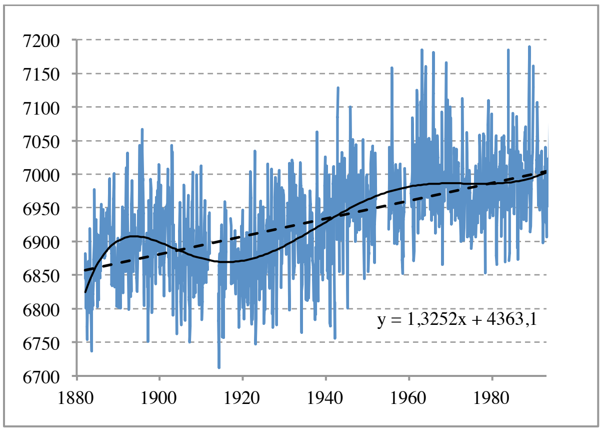

Figure 5: PSMSL for Cascais: for this long series a polynomial trend line (6th grade) seems more convenient to understand the cycles that are present in most of sea level curves. From 1882 till 1993 the linear trend is 1,325.

The lack of post-1993 data of Portuguese stations in PSMSL could be partially solved with the appearance of another entity: Sea Level Station Monitoring Facility, that publishes the sea level data for 6 Portuguese stations: Cascais, Setúbal, Sagres, Lagos, Albufeira, and Ponta Delgada (Azores Islands). Figure 6 shows the kind of chart everyone can obtain for a maximum of 30 days at Albufeira, for example. The correspondent 30 days data are also available online. The data are very detailed: the database for Albufeira has the periodicity of 1 minute.

However, some of the stations are not working properly. For instance, Cascais station doesn't have data after 2015-09-16.

It is also possible to ask for detailed data, longer than the fixed 30 days, for the available stations.

Figure 7 shows the best we could do with the 2-month of data from Cascais that we got. Their periodicity is 5 seconds. It includes more than a million points. It is a difficult file to manage. The picture shows numerous exceptionally high points that can contribute for an average of 0,193m. This represents the mean sea level for 2 month in Cascais. This is, of course, above the datum for Portugal, established in 1938, exactly from Cascais tide gauge (Silva et al., 2008).

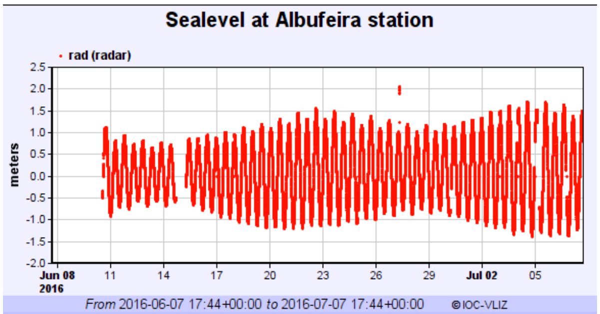

Figure 6: "Absolute Levels" (= as received) at Albufeira, from 2016-06-07 to 2016-07-07.

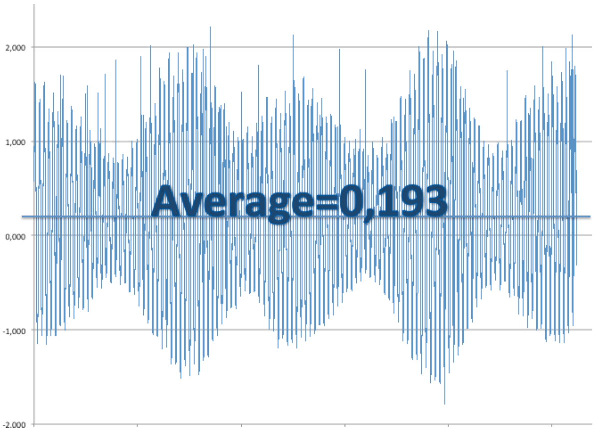

Figure 7: Detailed data for Cascais: 2015.07.17-2015.09.16. Data periodicity: 5 seconds

Of course it is possible to deal with this enormous amount of data with special computer capacities. However, possibly the obtained data will not be fully compatible with the long tide gauges of PSMSL data. For some reason this recent data are not yet published in PSMSL. Indeed, in a "disclaimer" at Sea Level Station Monitoring Facility we can read: "The data presented under this service <u>has not undergone any quality control and data is provided as received</u>**".**

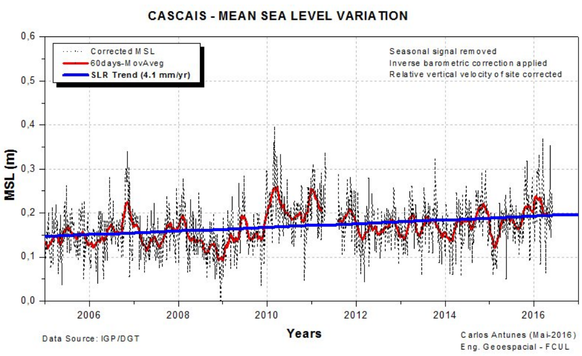

Figure 8: Mean sea level variation in Cascais according to Antunes:
http://webpages.fc.ul.pt/~cmantunes/hidrografia/hidro_mares.html

The results presented in figure 8 and 9 were obtained from this kind of data (Antunes, 2011). Several corrections were applied. We can see in the top of fig. 8:

- Seasonal signal removed
- Inverse barometric correction applied
- Relative vertical velocity of site corrected

All these corrections make a comparison with other stations and data very difficult, if possible.

One of the most disputable ideas is the assumption that Cascais is uplifting. Antunes (2009) say it very clearly:

"We have compared the 20-year moving average of tide gauge data set of Cascais with the global SRL model for Jevreja *et al*. (2006). The comparison resulted in a trend difference rate of 0.5mm yr-1, <u>which certainly must be related to a uplift of Cascais site</u>".

So, we consulted the available data for GPS of all the coastal places in Atlantic Europe. They are available in the SONEL site. There we can't see any tendency for an uplifting in Cascais (Fig. 10). On the contrary, there is a very small trend for subsiding.

Cascais recent tide gauge has a very short data series (about 11 years, fig. 9), with many disputable corrections. However, it is used to assume a sea level rise of 4,1mm/yr., about 3 times the linear trend of figure 5. This is the kind of thing that some media and most of the alarmists want to hear.

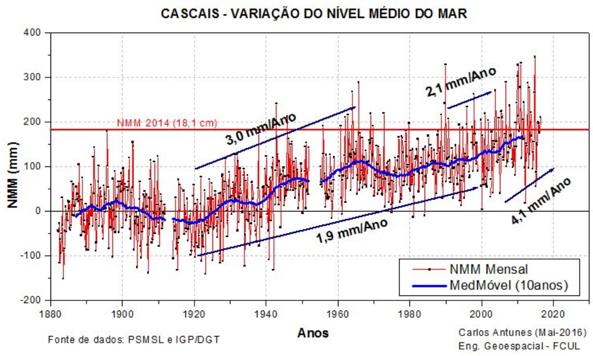

Figure 9: Sea level variation in Cascais from 1882 till 2016, according to Antunes:
http://webpages.fc.ul.pt/~cmantunes/hidrografia/hidro_mares.html

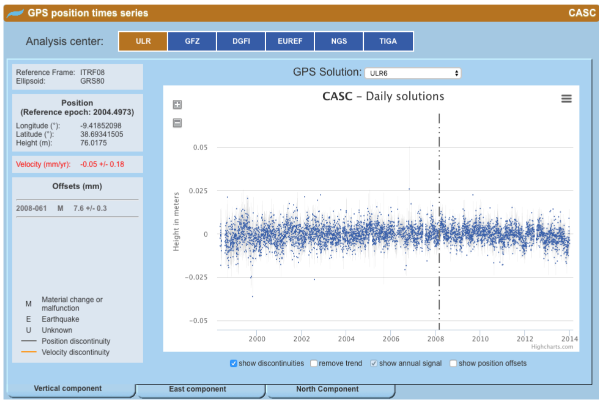

Figure 10: The SONEL vertical GPS data for Cascais doesn't confirm an uplifting situation: velocity (mm/yr) -0.05+/-0,18. The GPS is close (293m) to the tide gauge station.

Going a little further we consulted all the data for GPS vertical movements at SONEL site. We organized a spreadsheet with code, name, latitude, longitude, height, vertical velocity and error of the calculation.

In figure 11 the stations are sorted by their latitude in the Atlantic coast and in the direct sense in Iberia Mediterranean coastline. We used 2 different colors for positive (uplift) and negative (subsiding) stations. As expected, the northern stations in the Scandinavian coastline are clearly uplifting. The forebulge area is subsiding. However, we had some surprises: the only place in the Atlantic coast of Iberia that is uplifting is Santander. All the other stations are subsiding. <u>Some of them are apparently subsiding much more than Venice</u> (last station in the chart, that is used as a comparison). It is the case of Coruña and Huelva. But Lagos, Cascais, Vigo and all the coastal area of Aquitaine, in France, between Arcachon and St Jean de Luz seem to be subsiding too.

The GPS near Brest harbor presents a 0,01mm/yr. vertical velocity, very close to zero.

The Mediterranean coast of Iberia seems to be mostly uplifting (Gibraltar, Almeria, Alacant and Valencia). The data for Malaga and Cadiz are not robust enough according to SONEL site. The data from Ceuta present 2 different trends - in a very short distance, but both indicates subsiding.

Some conclusions:

Small series are more prone to give incorrect results. To be reliable they must be at least 18,6 yrs long because of the lunar cycle. It seem there are other cycles, e.g. a cycle of 60 years, so it is good to use series as long as possible.

Every sea level curve shows ups and downs. The polynomial curves seem to work better than linear regressions to understand the real dynamics of sea level (cf. fig. 5, Silva *et al*., 2008). Due to this oscillatory nature, the use a small part of a curve to calculate a trend is not a correct approach and can give very strange results, like the proposed 4,1mm/yr. proposed for Cascais (fig. 9).

Sea level variation at Brest, a series 208 years long, has a SL trend of 0,98mm/yr. Moreover, at the GPS station, 293m from the tide gauge, the vertical velocity is 0,11+/- 0,11 (fig. 11).

So, *ca* 1mm/yr can represent the "eustatic" component of relative sea level variation (Mörner, 2014). The proposed trends at Cascais (fig. 9) don't seem plausible unless there is a very intense subsiding of the area - which doesn't seem to be the case. Moreover, according to Antunes (2009), its eustatic curve has been corrected as if the place was uplifting (+0,5mm/yr).

Looking to fig. 11 there is no doubt that isostasy is not global, but regional (Mörner, 2015). It is also evident that many stations in Atlantic Europe, outside the forebulge area, have also an apparent subsiding trend that **augments relative sea level rise**.

The vertical velocity of very close stations (Ceuta: CEUT and CEU1, fig. 11) suggests the existence of differential tectonic movements. And so, the "absolute" sea level trends must be always calculated on the assumption of the possibility of vertical movements between tide gauge stations that seem to stay on similar geographical situations.

The study and comparison of GPS and tide gauge data may be a key tool to understand sea level changes issues among many other factors.

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PERMANENT SERVICE FOR MEAN SEA LEVEL, PSMSL: http://www.psmsl.org/data/

SEA LEVEL STATION MONITORING FACILITY: http://www.ioc-sealevelmonitoring.org/

SONEL GPS: http://www.sonel.org/?lang=en

Figure 11 (bellow): Vertical velocities at European coastline from Scandinavia till Mediterranean Iberian Coast (SONEL data). Iberian stations are marked with a blue arrow.