Tides, Water Level and Currents Working Group – TWCWG1
Niterói, Brazil, 25-29 April 2016

"Peruvian Sea Level Network"

Captain José Tejeda

Content

- Sea level measurements
- Data transmission
- Peruvian sea level station network
- Components of Sea level station network
- Tides at Website
- Operational and scientific purposes
- Radar – Pressure sensor comparison
- Conclusions

Sea Level Measurements

Near real time

Real time

Mechanical Stations 1942 ~ 1985	Automatic Stations 2001	Automatic Stations 2010 ~ 2014	New Stations 2015

08 → *Upgrade process* → 19

Permanents Stations

Tsunami Warning System

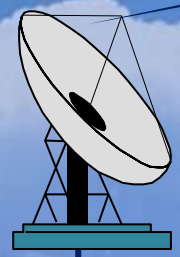
National Network

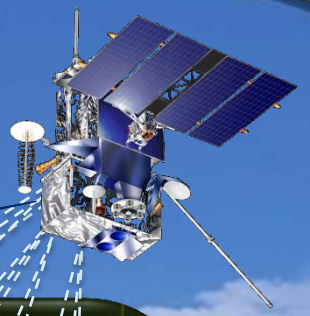
Data Transmission

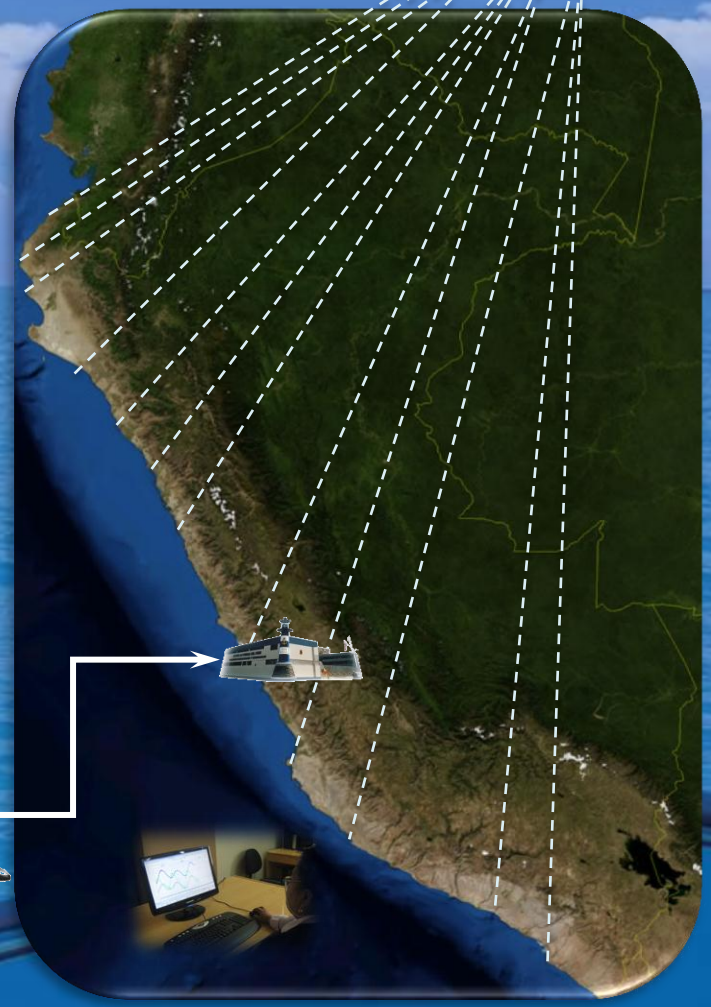
~ 2000
- Monthly via terrestrial
- Radio link every minute

2010
- Satellite GOES 8 every 3 hours
- GPRS (1 - 10 minutes)

2011 ~
- GPRS (1 - 10 minutes)
- IRIDIUM (1 - 5 minutes)
- GOES (1 - 5 minutes)



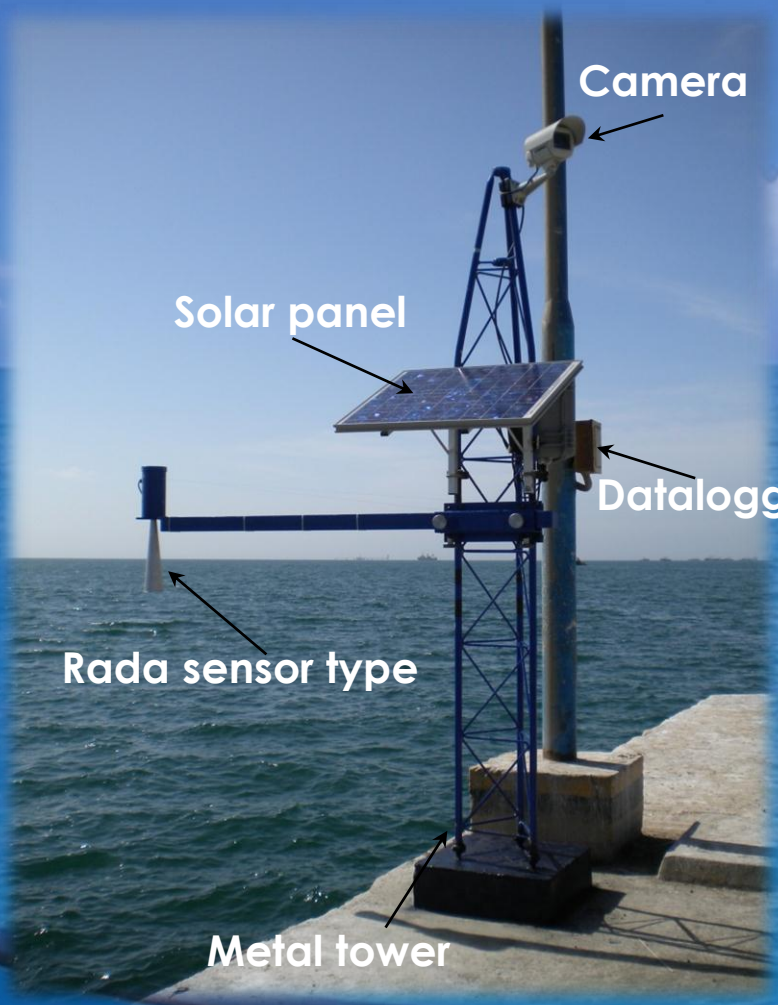


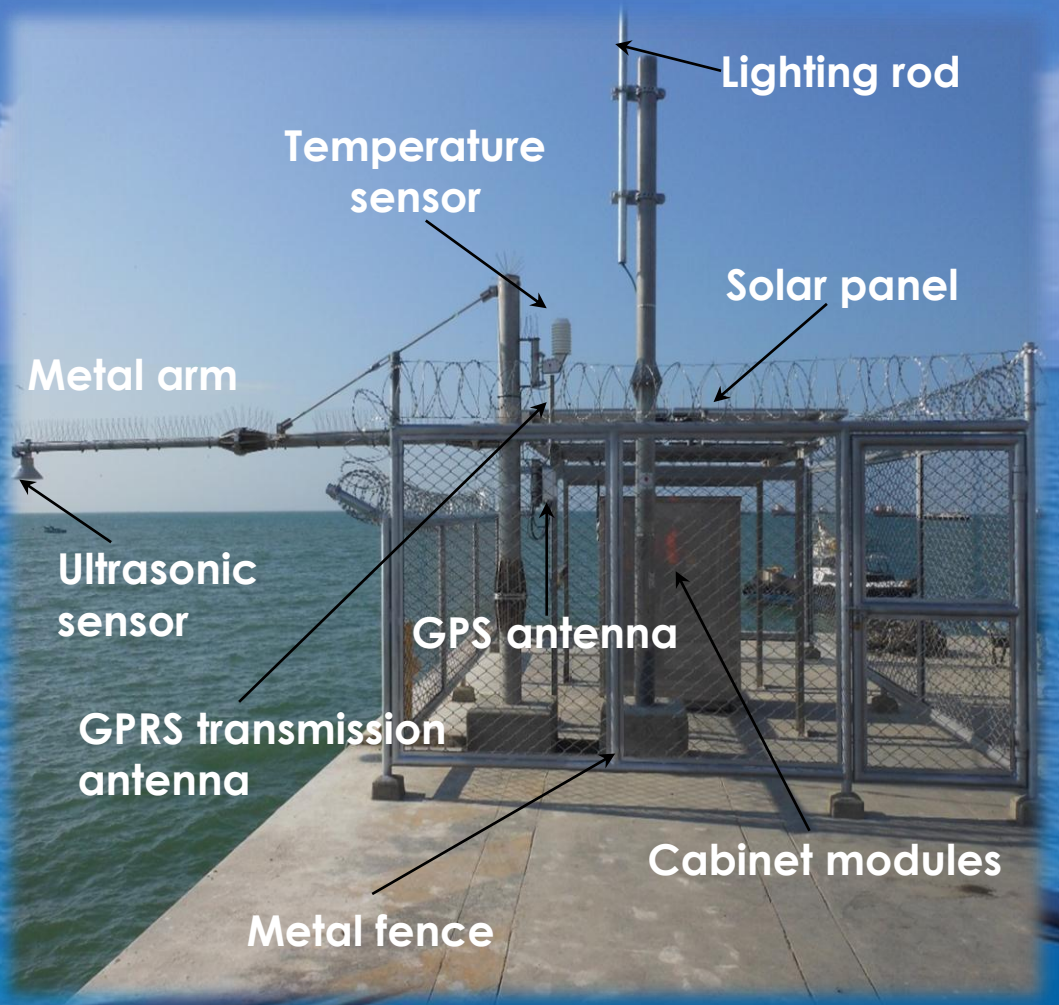


Peruvian Sea Level Stations Network

Zone	Station	Location	
		Latitud °S	Longitud °W
North	*La Cruz*	03°38'01"	080°35'15"
	Talara	04°34'30"	081°16'57"
	Paita	05°05'01"	081°06'27"
	Bayóvar	05°47'38"	081°03'16"
	Lobos de Afuera	06°56'06"	080°43'19"
Central	*Salaverry*	08°13'40"	078°58'54"
	Chimbote	09°04'34"	078°36'45"
	Huarmey	10°05'57"	078°10'54"
	Huacho	11°07'18"	077°36'58"
	Callao	12°04'08"	077°10'00"
	Cerro Azul	13°01'33"	076°29'07"
	Pisco	13°49'10"	076°15'07"
South	*San Juan*	15°21'19"	075°09'37"
	Chala	15°51'58"	074°14'53"
	La Planchada	16°13'52"	073°41'39"
	Atico	16°24'17"	073°13'15"
	Matarani	17°00'03"	072°06'31"
	Ilo	17°38'40"	071°20'54"
	Caleta Grau	17°59'36"	070°53'03"

Components of the Sea Level Stations





Tide at Website

Tide Table Predictions

CHIMBOTE	
2016-03-30	
Hora	Altura
02:02:00	50 Cm.
09:26:00	109 Cm.
16:28:00	70 Cm.
20:28:00	92 Cm.
2016-03-31	
Hora	Altura
02:49:00	52 Cm.
11:17:00	110 Cm.
18:13:00	67 Cm.
22:07:00	88 Cm.

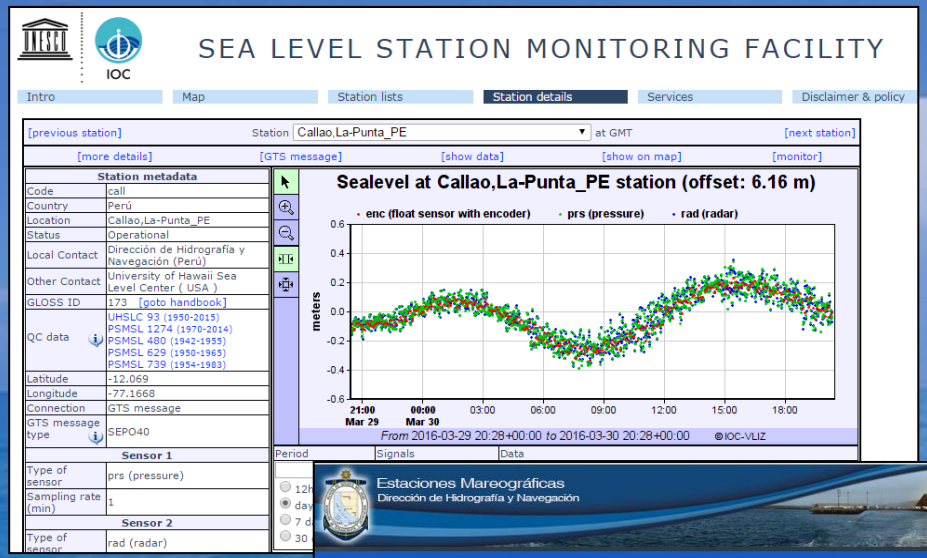
Links to access

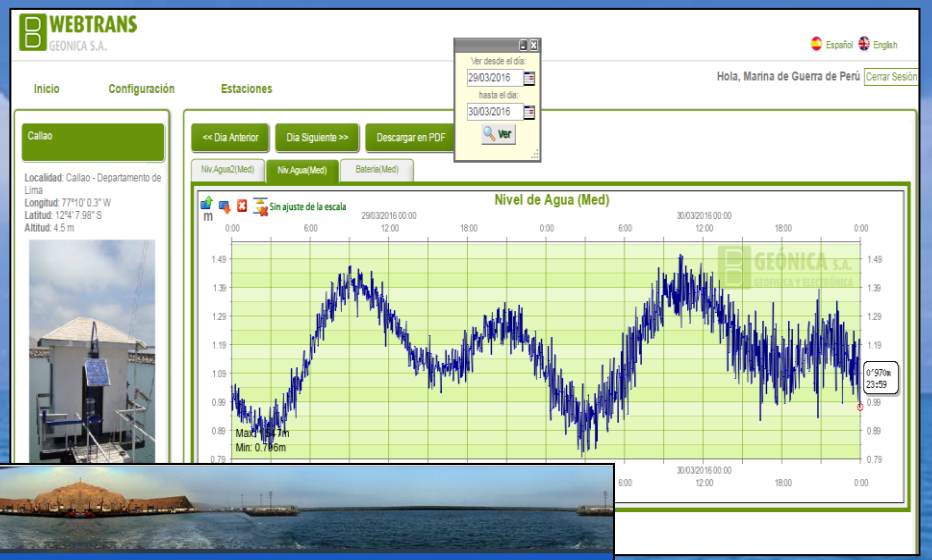
https://www.dhn.mil.pe/secciones/mareas/index.php?f=2016-03-30

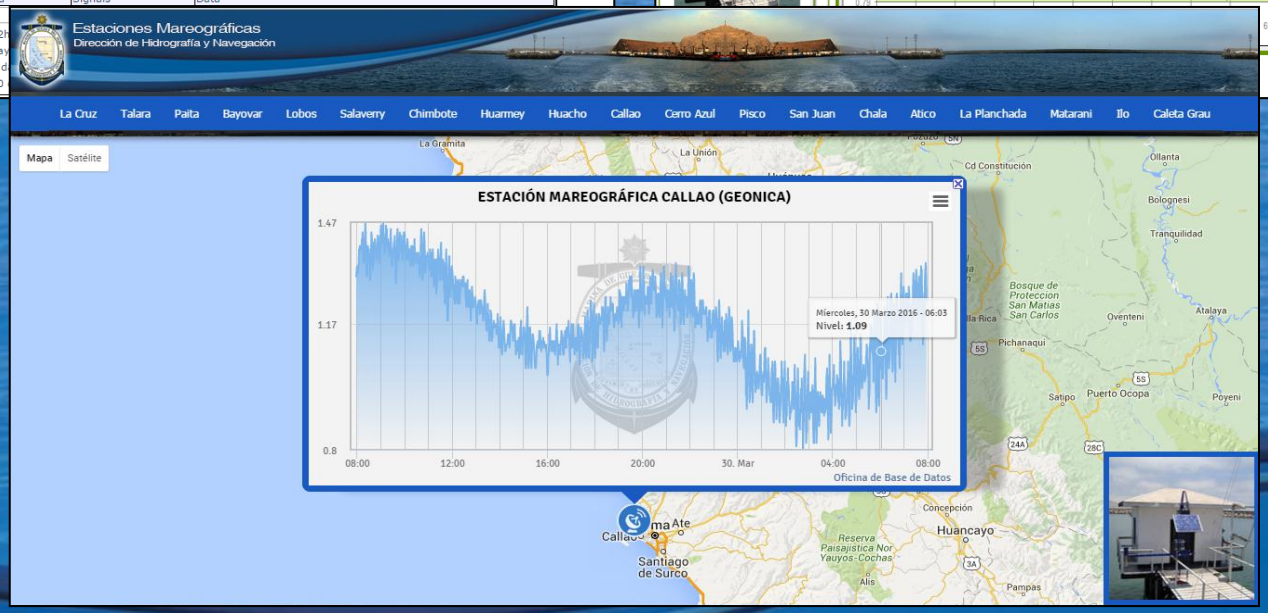
Tidal Data in Real Time

http://www.ioc-sealevelmonitoring.org/

http://webtrans.geonica.com/index.php

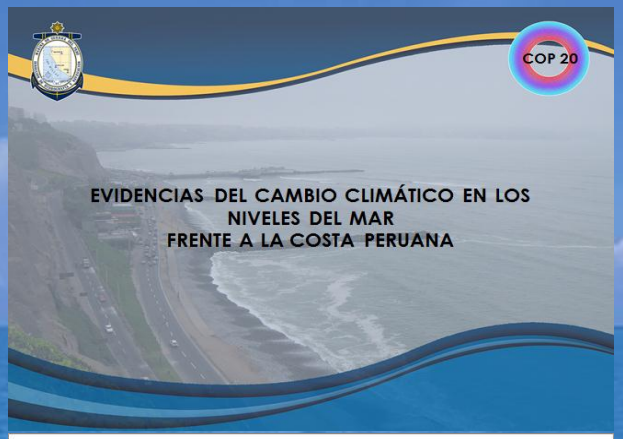


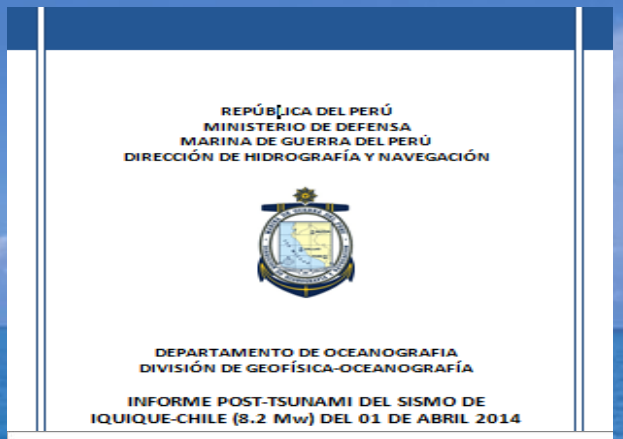


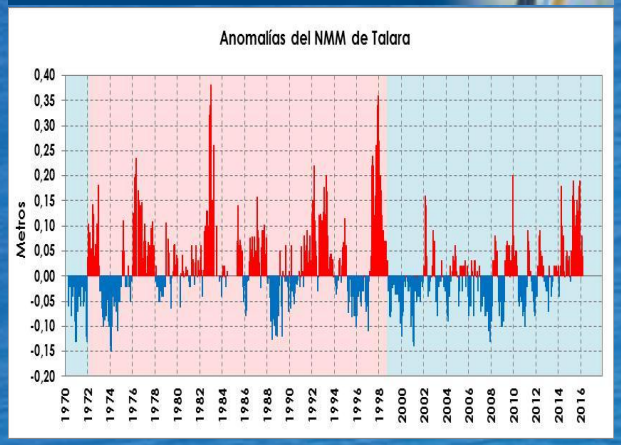


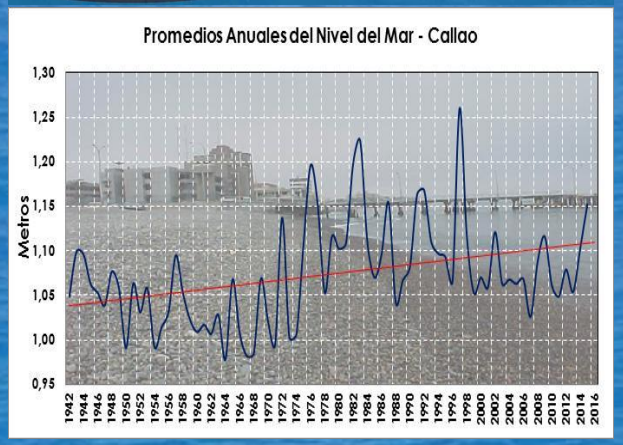
https://www.dhn.mil.pe/secciones/departamentos/oceanografia/apps/est_mareograficas/

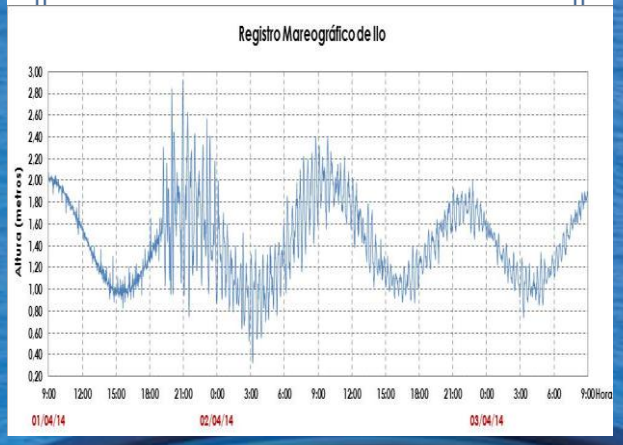
Operational and Scientific purposes











Comparison between Radar and Pressure Sensor

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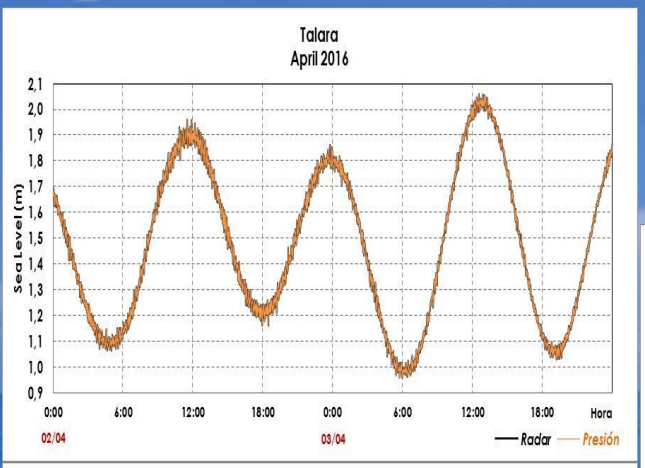

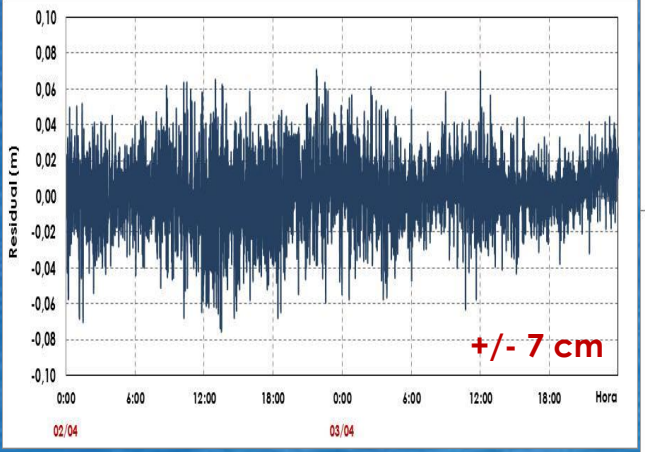

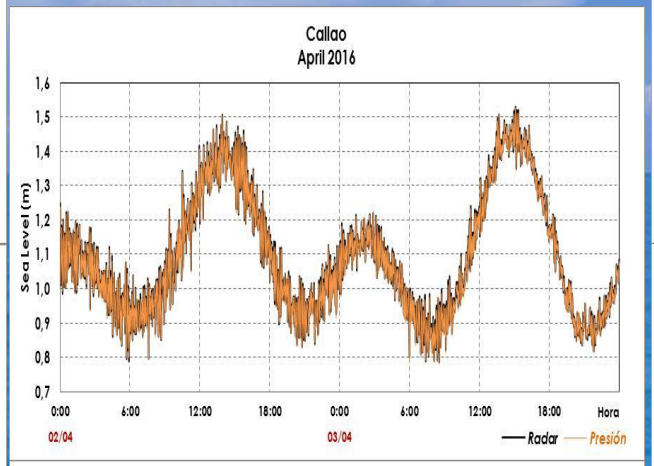

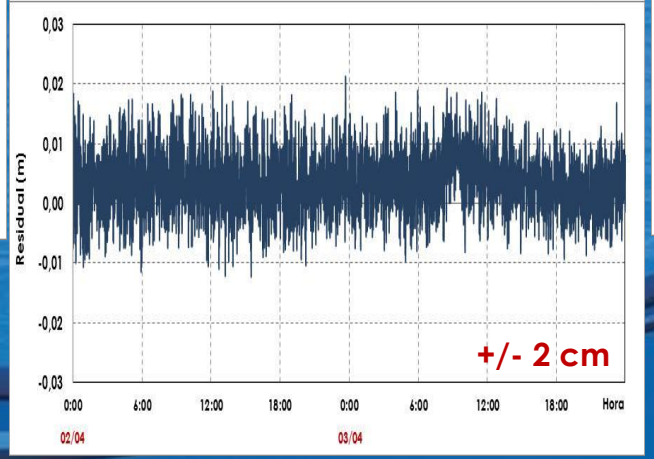

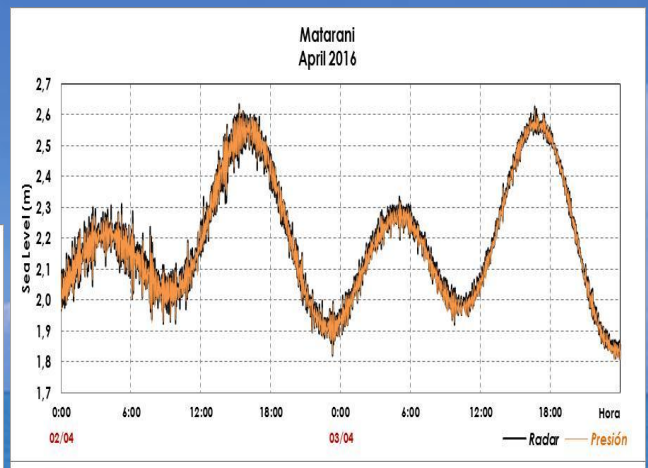

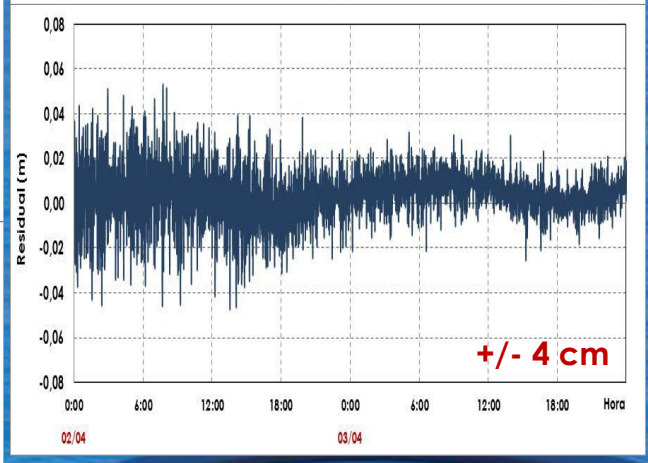

Conclusions

- Tidal stations are, at present, composed of radar and pressure sensor, secondary and main sea level sensors and a camera that allows to check changes and/or waves abnormalities from headquarters.

- The use of redundant systems (radar/pressure) and real-time transmission (satellite/telephony) will improve the work of the DHN as responsible body before the National tsunami Warning System.

- Upgrading and densification of sea level stations have improved reception of information for operational and acientific purposes. Among the principal scientific research are: the monitoring of El Niño and La Niña, the study of sea level rise related to the climate change, detection and monitoring of tsunamis and flood forecasting by rough seas.

Conclusions

- Based on the comparisons made in the sea leve lmeasuring sensors (radas vs pressure), we note that both equipments are reliable and similar. However, the sensor type radar is very sensibly to the turbulence generated by waves and local winds in areas of open beach,; otherwise, occurs in protected areas ofthe marine dynamics and winds (calm (seas) in which sensors are useful.

- It is important to consider the willingness and participation in courses and/or workshops on tides for hydrography. In this case, we require specifically expand our knowledge on tidal currents.

Thanks