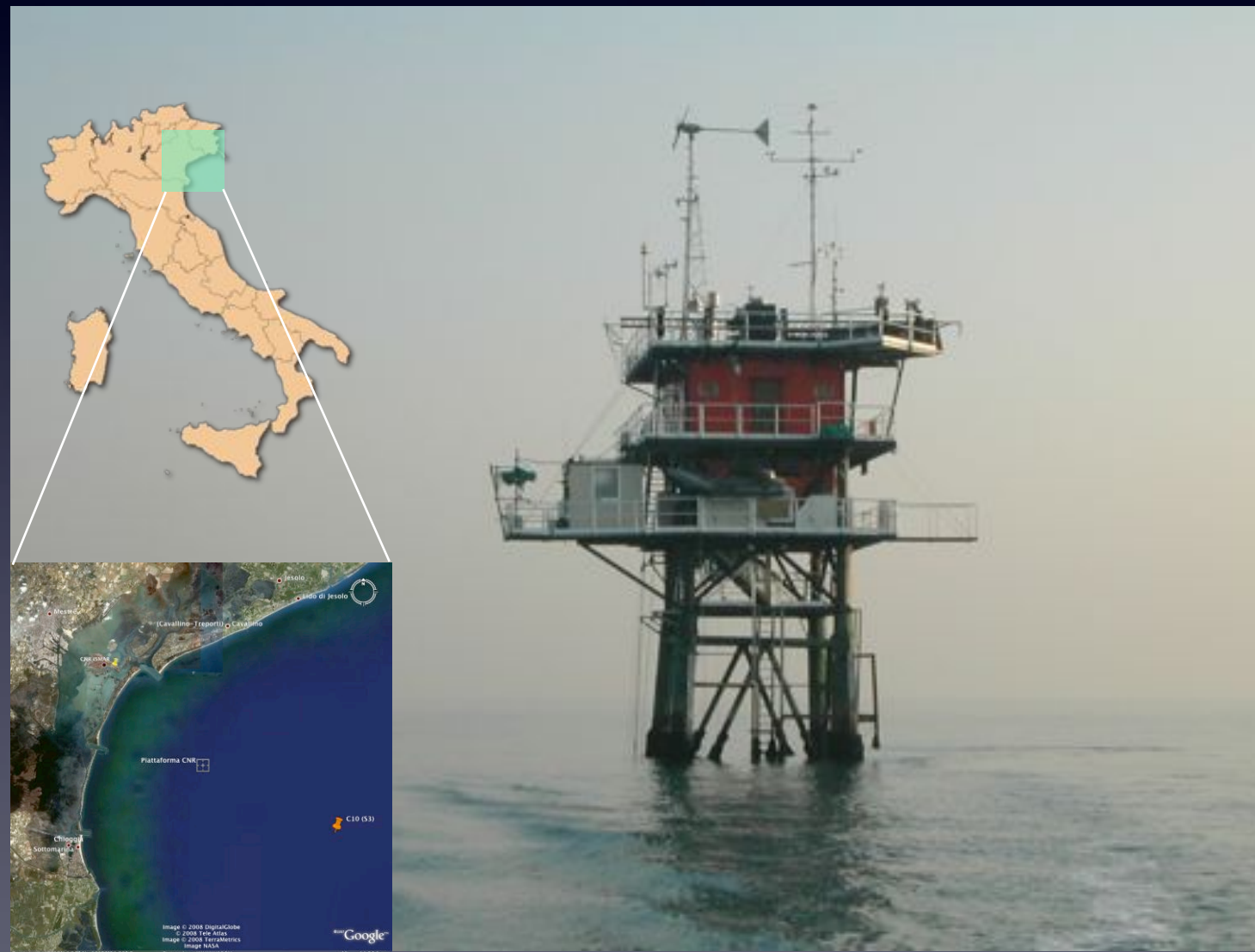


Aqua Alta

Oceanographic Tower
12°30'N 45°18'51"E

Institute of Marine Sciences
National Research Council



www.ve.ismar.cnr.it/piattaforma/

November 1966



January 1970



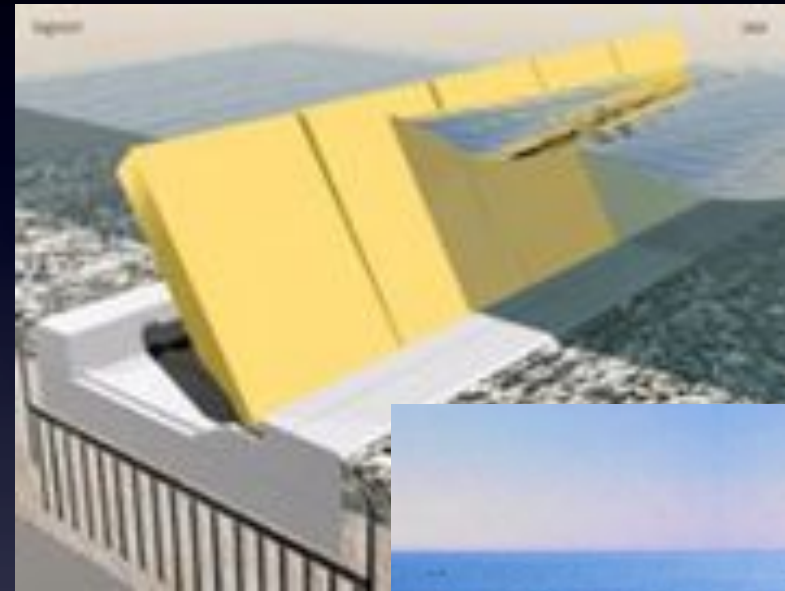
March 1970



Venice High Tides a “Glocal” issue



Venice, CNR Institute, 1 december 2008



Couple of days ago

Acqua Alta networks

- LTER (Long Term Ecological Research)



- Jerico (FP7 infrastr.)



- Aeronet (NASA)



Evolution in 40 years



First Floor



Second floor



Third floor (terrazza)



mast



instrum. jrc



meteo
City of Venice



Running activities (CNR)

- Meteo, waves, tide

- meteo, waves,
- Waves cinematics
- Models validation

ADCP AWAC marea (sens. Radar)

Hi-res 3D cameras

- Fish population

underwater webcams

- Pollution

Deposimeters, SQM (Sky Quality Meter)

- Hydrology

- Water column
- CO₂

3 Seabird microcat SBE 37, 10 SBE 56

CO₂ Contros HydroC

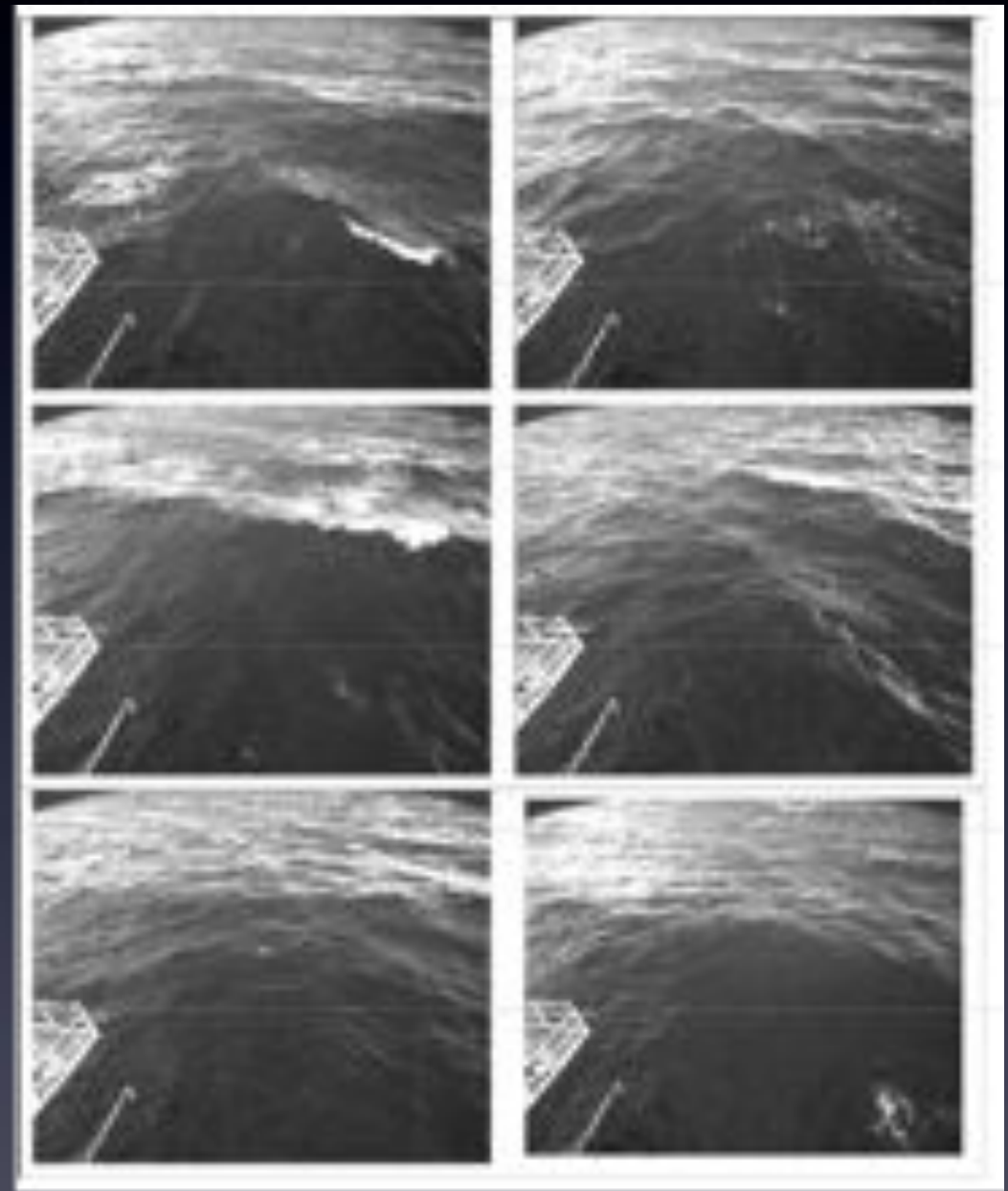
Running activities (external)

- City of Venice
 - meteo
 - tidal level
- ISPRA (Nat. Env. Agency)
 - meteo
 - tidal level
- JRC
 - bio optical, remote sensing sea truth



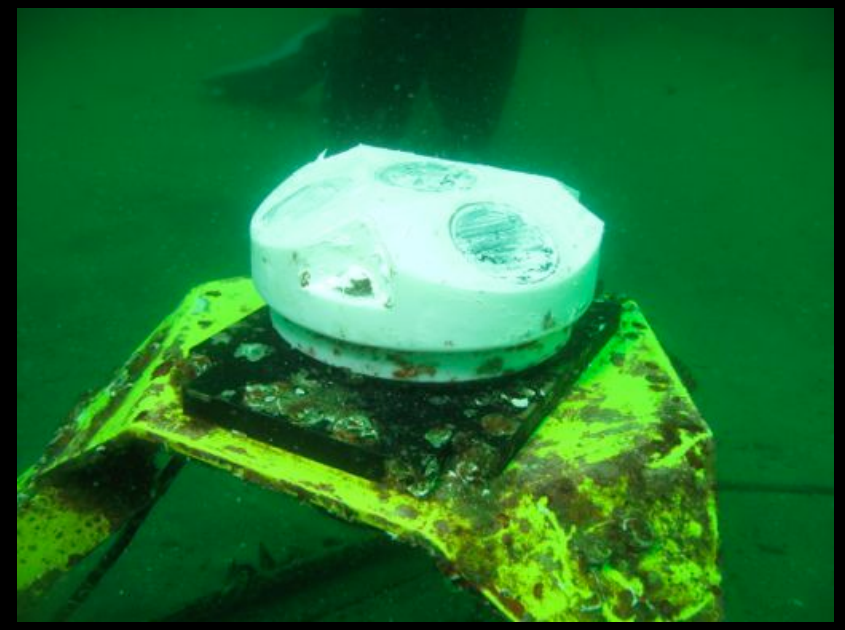
Space-time extremes and nonlinear statistics

- Height ~ 12.5 m msl
- baseline ~ 3 m
- 2 Cameras
- 5 Megapixel (2456x2058)
- 5 mm focal length
- 10 fps
- Synchronization: $\Delta t < 1000$ s



Instrument maintenance

Even if technology helps a lot of hand work is required



...but it brings pleasant moments too!



REAL real-time

Two redundant link

- Link 17 Ghz PTF-Torre S. Nicolo-new building arsenale



- Link 5 Ghz PTF-San Camillo-old building sette martiri





ICTP collaboration



QoS?



Web access by Google analytics

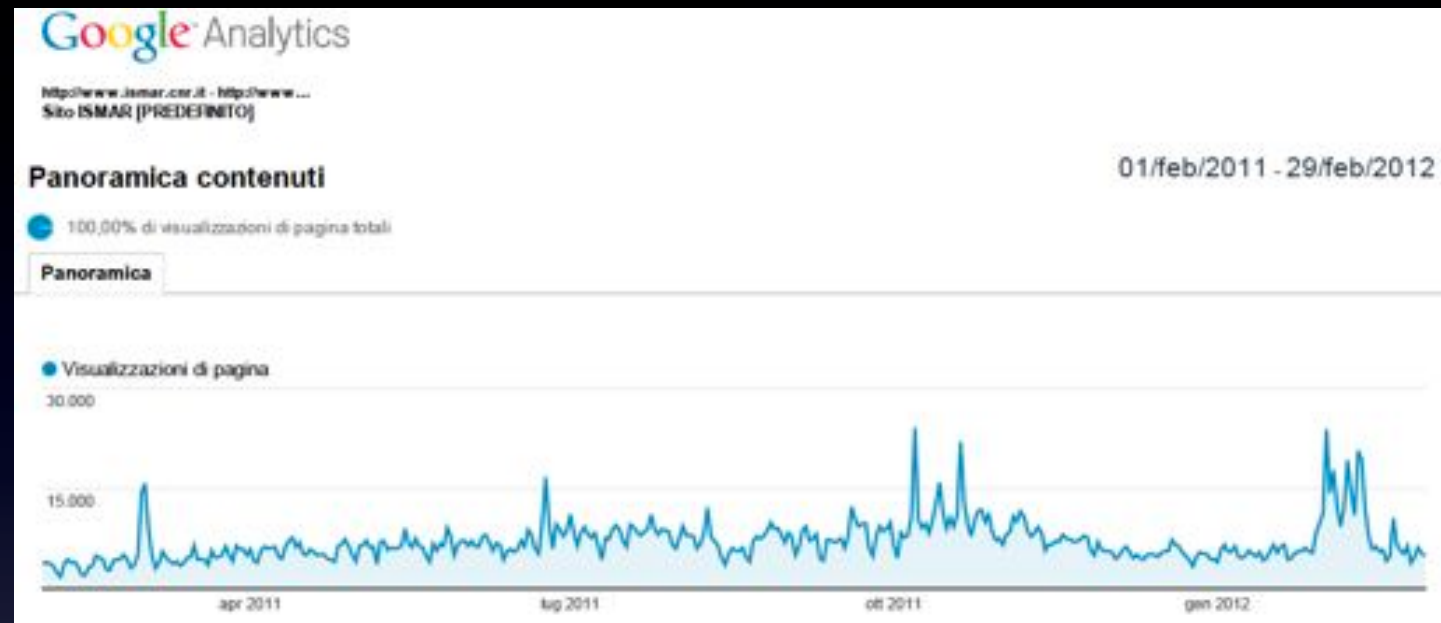


around 1500 contacts per day with peaks over 4000 during storms.

More than 20 Mbps upload bandwidth (mostly due to webcam streaming)

Surprising success!

- Around 70% of the internet traffic is addressed on real time data from the Oceanographic Tower. Most of it is dedicated to underwater webcams observation.
- We think that one of the key of this popular response is the access to real-time and open environmental data.



Pagina	Visualizzazioni di pagina	% Visualizzazioni di pagina
1. /infrastrutture/piattaforma-acqua-alta/webcam/webcam-streaming-sub	401.449	14,62%
2. /infrastrutture/piattaforma-acqua-alta/webcam/webcam-streaming	380.811	13,87%
3. /infrastrutture/piattaforma-acqua-alta/webcam/webcam-streaming-est	333.287	12,14%
4. /infrastrutture/piattaforma-acqua-alta/webcam	281.313	10,24%
5. /infrastrutture/piattaforma-acqua-alta/webcam/webcam-streaming-sub-13-m	159.972	5,83%
6. /infrastrutture/piattaforma-acqua-alta/	110.171	4,01%
7. /infrastrutture/piattaforma-acqua-alta/meteo/visualizzazione-dati-meteo-in-tempo-reale	104.117	3,79%
8. /infrastrutture/piattaforma-acqua-alta/meteo	100.264	3,65%
9. /infrastrutture/piattaforma-acqua-alta	74.428	2,71%
10. /	73.150	2,66%

© 2012 Google



Visual Census of the pelagic ichthyofauna using an underwater webcam in the Gulf of Venice (Acqua Alta Oceanographic Tower)

**Sp. degree thesis in Conservation of the
Environment, Science Faculty, Parma University
Tommaso Marzolini**



Pros

- reliability, accuracy, low cost
 - Minimally invasive;
- Very long temporal series potential;
 - Good objectivity and statistical independence of samples.

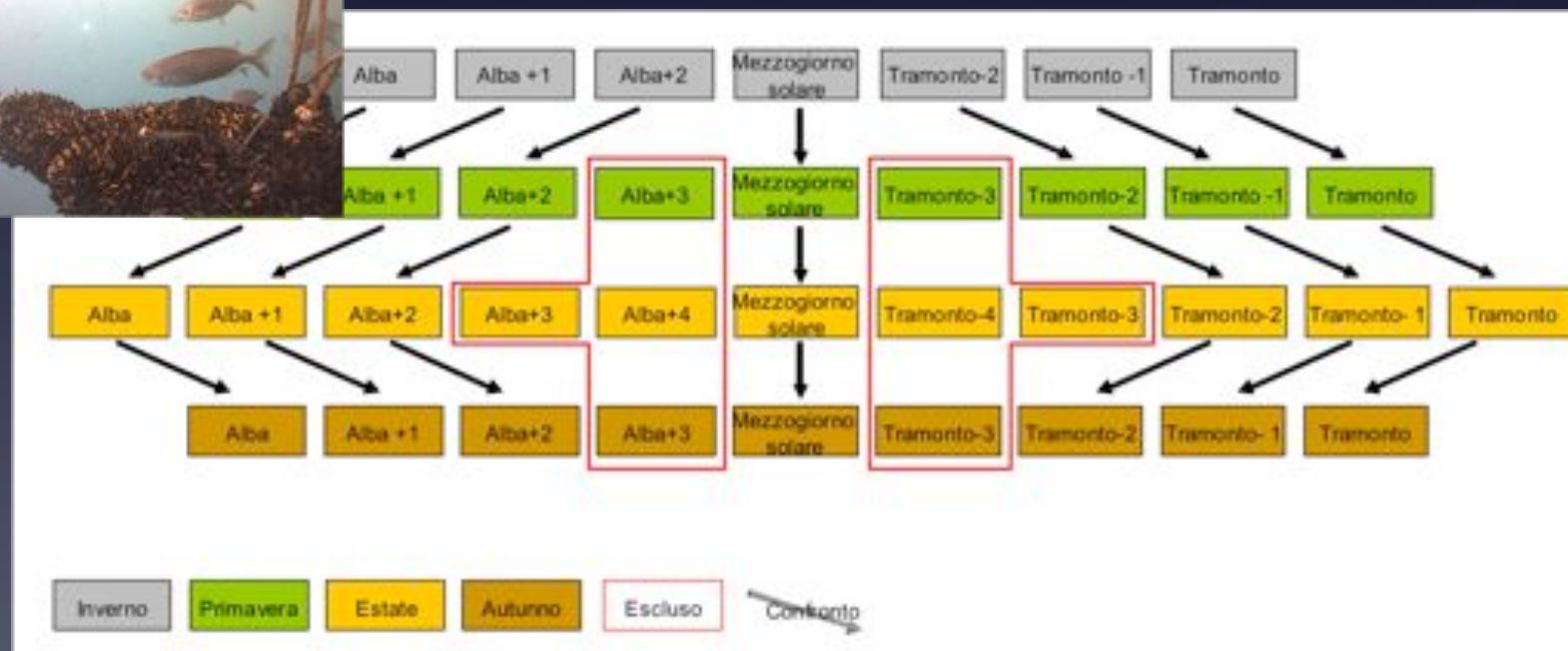


Cons

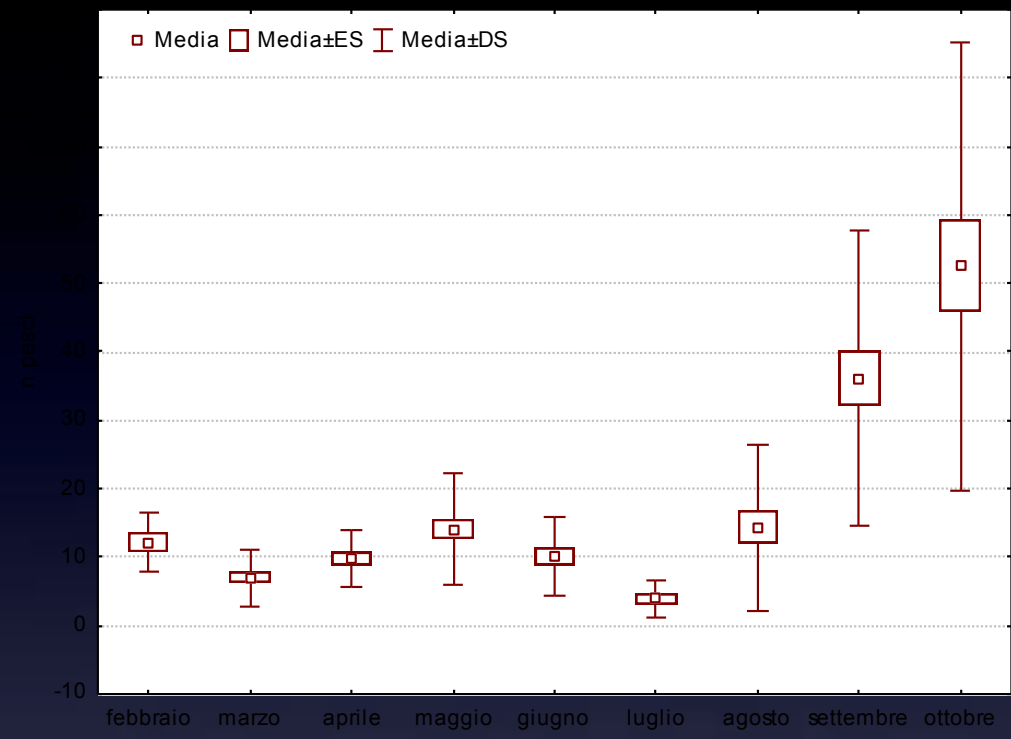
- Some limitations in low transparency situations;
- Reduced observing field;
- Spatial limits;
- Tigmotropic influence of the structure.



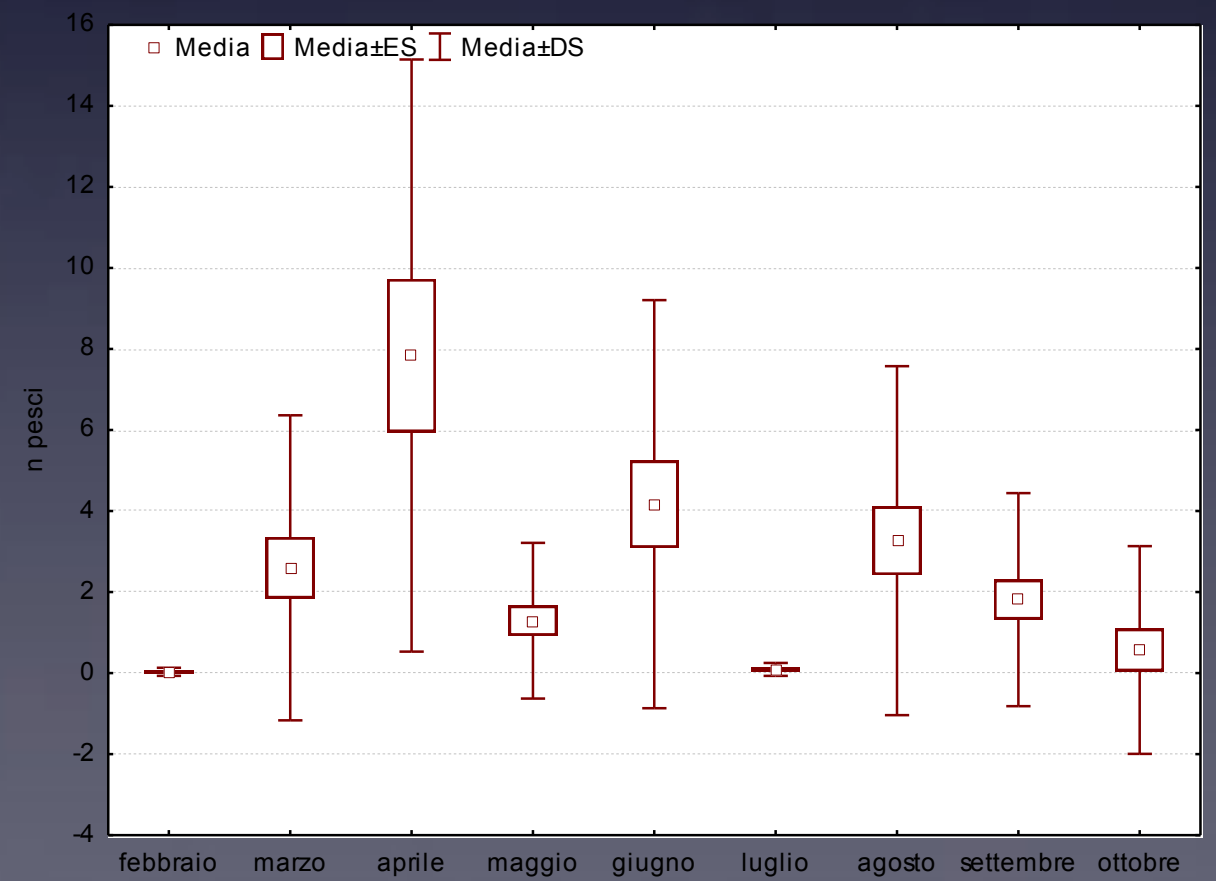
Seasonal and diel variations



demersal species



Pelagic species



Toward a citizen science approach

- Why? Who? When?
- Fish populations are mainly studied by fishing activity data (often not reliable)
- Anthropogenic induced environmental changes often involves fish populations (overfishing, meridionalization, jellyfish swarms)
- We'll look not only at long-term variations in fish population but also at critical phenomena (jelly fish swarms, mucilage events)
- Enlarge the chance to observe in-situ marine life
- We need long-term resources, people need to get involved
- The preliminary target will be primary school
- Starting this summer

OCCHIO ALLA MEDUSA

Vedete una di queste specie? Segnalatecelo!
Aiuterete la scienza e il servizio "METEOMEDUSE".

Segnalatela così:

- 1) via cellulare mandando in sms al nr 333.2403712
- 2) se avete l'iPhone o smartphone Android, scaricando da una specifica app (da iTunes per iPhone e da Android Market per Android)
- 3) via Web collegandovi al sito www.fo.it/meduse
- 4) via email a boerogunnis@fo.it e indicando la specie, il quadrato, il modo di osservazione (da barca, nuotando)

FO

E se volete avere la situazione aggiornata delle coste, collegatevi al servizio Meteomeduse su iPhone, Android (vedere qui sopra)

CNR FORMA South

2016-05-16 09:19:50



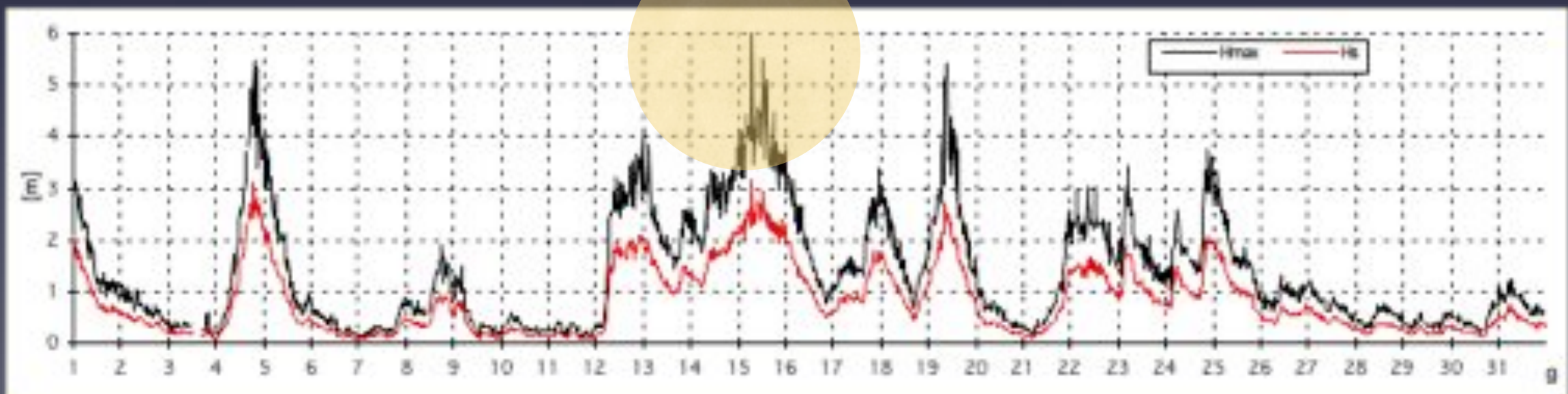
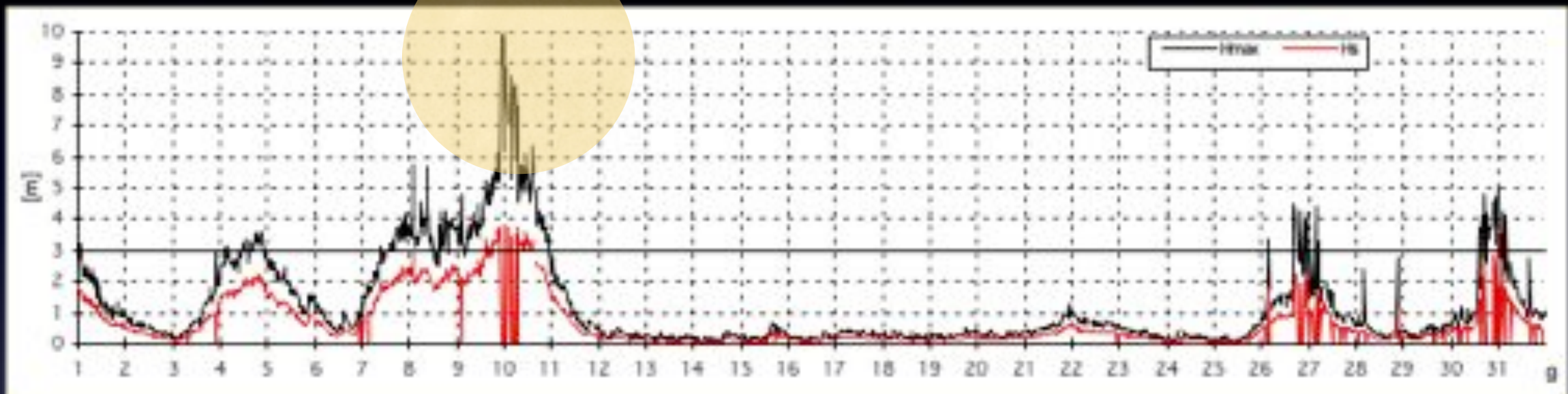
Plattaforma Oceanografica "Accia Alta"

2.9°C 95% 40.7 kts do NE 3.5 mm 1002 hPa

205231 EC UC

FT CH 20 FRNO 20C BY

Freak waves?



Webcams helps





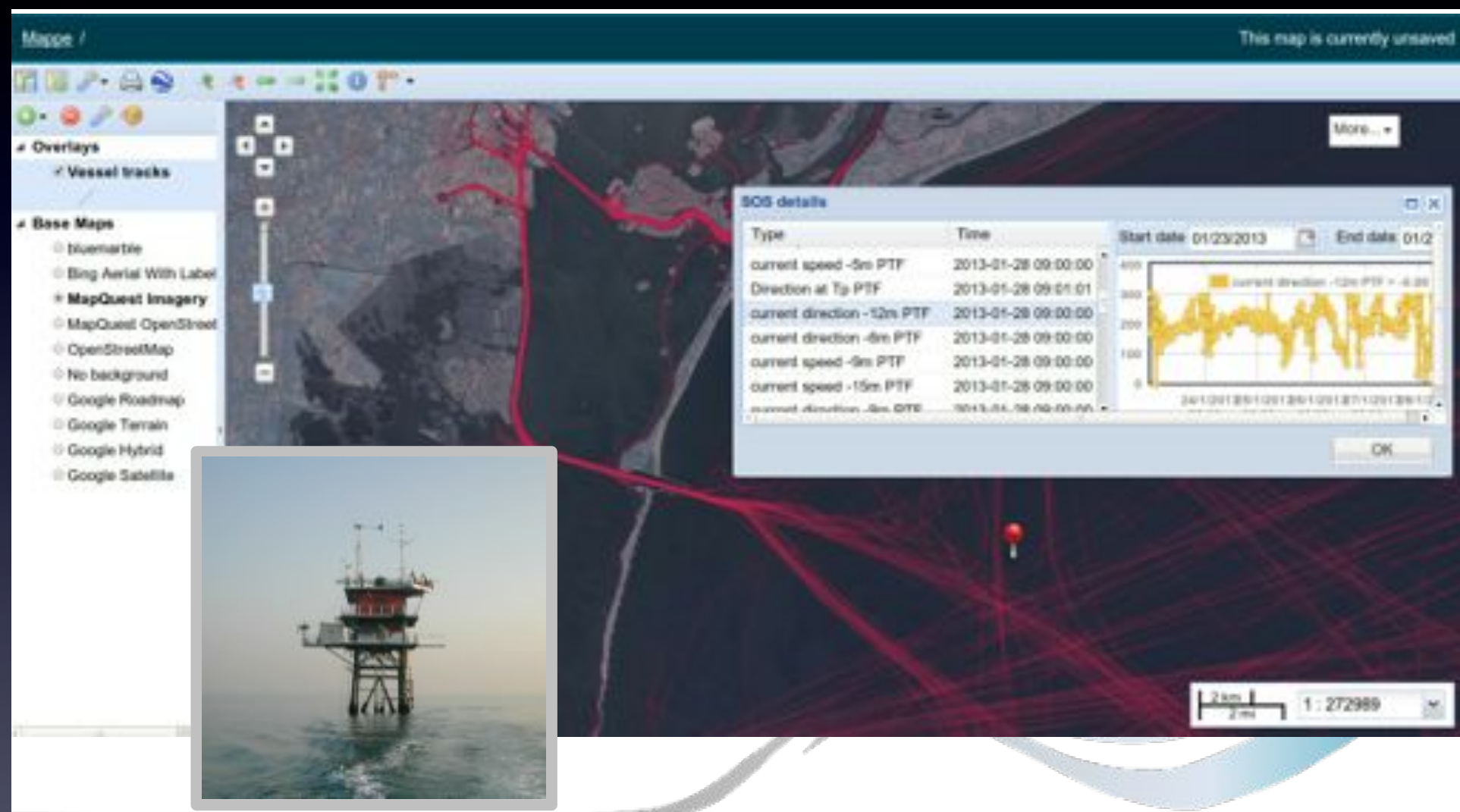
CNR
Consiglio Nazionale
delle Ricerche



ISMAR
Istituto di Scienze Marine



Plattaforma Oceanografica "Acqua Alta"
7.40C 91% 0.0 kts da WNW 0.0 m 1026.0 hPa



What is SWE?

- SWE is technology to *enable* the realization of Sensor Webs
 - much like TCP/IP, HTML, and HTTPD enabled the WWW
- SWE is a suite of standards from OGC (Open Geospatial Consortium)
 - 3 standard XML encodings (SensorML, O&M, TML)
 - 4 standard web service interfaces (SOS, SAS, SPS, WNS)
- SWE is a Service Oriented Architecture (SOA) approach
- SWE is an open, consensus-based set of standards

Why SWE?

- Break down current stovepipes
- Enable interoperability not only *within* communities but *between* traditionally disparate communities
 - **different sensor types:** in-situ vs remote sensors, video, models, CBRNE
 - **different disciplines:** science, defense, intelligence, emergency management, utilities, etc.
 - **different sciences:** ocean, atmosphere, land, bio, target recognition, signal processing, etc.
 - **different agencies:** government, commercial, private, Joe Public
- Leverage benefits of open standards
- Backed by the Open Geospatial Consortium process
 - 350+ members cooperating in consensus process
 - Interoperability Process testing
 - CITE compliance testing

What are the benefits of SWE?

- Sensor system agnostic - Virtually any sensor or model system can be supported
- Net-Centric, SOA-based
 - Distributed architecture allows independent development of services but enables on-the-fly connectivity between resources
- Semantically tied
 - Relies on online dictionaries and ontologies for semantics
 - Key to interoperability
- Traceability
 - observation lineage
 - quality of measurement support

