

# Research and data infrastructure obtained at NIB-Marine Biology Station Piran



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By the year 2001, after five years of effort, the coastal oceanographic station was operational. This station comprises of an instrumented oceanic buoy deployed in the Gulf of Trieste and a data reception station located at the [Marine Biology Station in Piran](#).

The buoy continuously records oceanographic data at a site thought to be typical of the southern half of the Gulf of Trieste. This data is complemented by observations taken from the research vessel Sagita. Data from the buoy can record rapid changes in oceanographic and environmental parameters, for example such as might arise from southerly excursions of water masses originating in the Northern Adriatic. Complimentary measurements taken from the research vessel allows the spatial extent of such events to be estimated.



## Comments on Project Implementation

Technical difficulties arose on several occasions during the implementation of this project. In some instances we indicated that it was not possible to overcome these difficulties by the due date for completion, i.e., by the end of 2000. In addition, in December of 2000, the oceanographic buoy was run over by a large vessel which was a further setback. These problems were compounded by the level of coordination required between financiers and the installation firms. Fortunately, we had the understanding of the services responsible for the necessary approvals (The Inter - municipal Board for Natural and Cultural Heritage and the Municipality of Piran Maritime Administration). Eight contracts were finalized in regard to the oceanographic station.

The value of the equipment on the Oceanographic Buoy Piran is about 60.000€ (EUR). Our Institute does not derive any financial benefits from this project, yet it wishes to continue to manage operation of the oceanographic buoy. Above all, it wishes to upgrade the data at this web site and within the oceanographic station data base. We have had substantial support for the continuation of this part of the project from the National Unesco Commission which has also planned a partial financing for the continuing oceanographic buoy video monitoring into the year 2001. The value of this support is for only up to one third of the required funds - leaving a substantial shortfall.

For the safety of shipping and in the wish to avoid future collisions of vessels into the buoy, we are often informing from this pages about the position of the almost three tonnes heavy oceanographic buoy in front of the Punta of Piran.



The coordinates of the oceanographic buoy are: 45° 32,90' N, 13° 33,00' E



NATIONAL INSTITUTE OF BIOLOGY  
MARINE BIOLOGY STATION



9<sup>th</sup> May 2008



Piran, 21. March 2017

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*The system consists of:*

*Observing Systems:*

- I. The oceanographical buoy “VIDA”*
- II. High Frequency Radar*
  
- III. Numerical modeling (3D ocean models)*

## I. OCEANOGRAPHIC BUOY “VIDA”

*Near Real Time data available from 2002*

*Air :*

- *Temperature, Humidity, Wind speed, Wind direction, Wind gusts*

*Sea:*

- *Temperature and salinity at the sea surface (depth ~2 m)*
- *Temperature at the sea floor (depth ~ 23 m)*
- *Pressure at the sea floor*
- *Currents: measured (from 2 m above sea floor - 21 above sea floor , 20 cells, 30 min average)*

## I. OCEANOGRAPHIC BUOY “VIDA”

### *From September 2006*

- *Wave height: maximum height, mean direction (azimuth), mean period*

### *From May 2008*

- *O<sub>2</sub> concentration*
- *Chlorophyll – a*

### *From June 2011*

- *Photosynthetically active radiation (PAR)*



# I. OCEANOGRAPHIC BUOY “VIDA”

## A marine in situ laboratory

A group of biosensors :

- a multi-modular miniaturized apparatus that will host in a single unit—the Main Box—a Sampling Module and an Analysis Module.
- Saxitoxin, Okadaic acid, Domoic acid, Palytoxin, Tributyltin, Diuron, PentaBDPE, Sulphonamides - biotoxins.

7<sup>th</sup> FP project: “Sensing toxicants in Marine waters makes Sense using biosensors” (SMS)



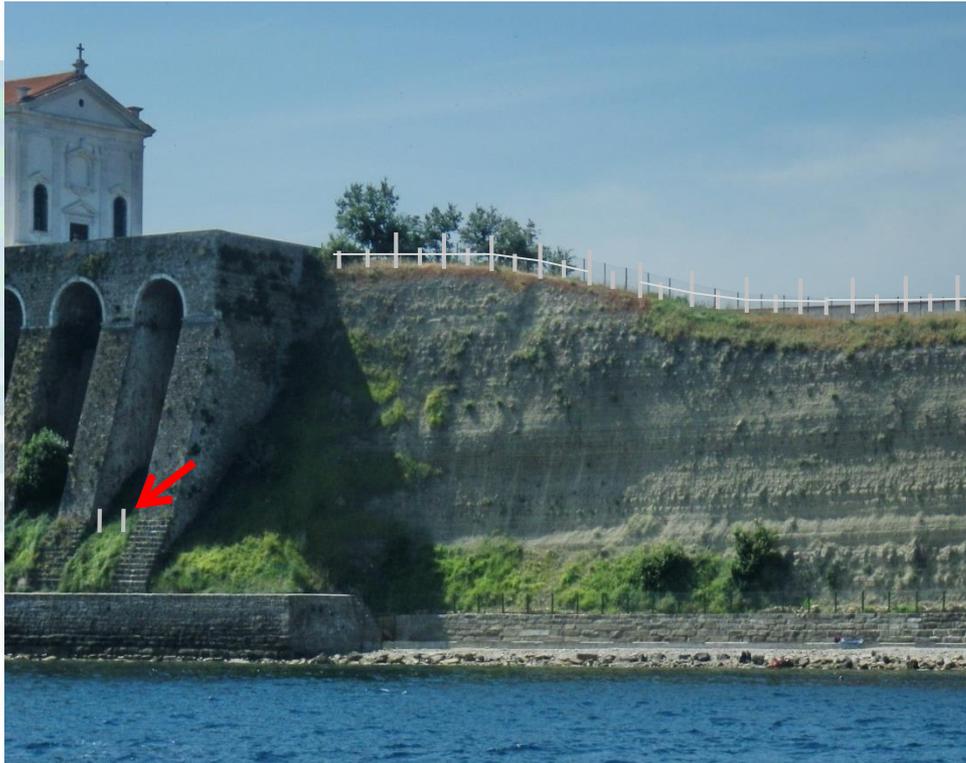
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<http://buoy.mbss.org>

[http://buoy.mbss.org/portal/index.php?option=com\\_content&task=view&id=104&Itemid=46&lang=en](http://buoy.mbss.org/portal/index.php?option=com_content&task=view&id=104&Itemid=46&lang=en)

## II. HF Radar



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## The setup of HF radar in Piran



Piran, 21. March 2017



June 2014

## The setup of HF radar in Piran



October 2014

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## The setup of the twin HF radar at the Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS in Aurisina, Italy (IT) , January 2015

measurements  
of surface  
currents &  
waves

Currents are  
available on the  
web in near real  
time.



Piran, 21. March 2017

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## SLOVENIAN ENVIRONMENTAL AGENCY'S INFRASTRUCTURE

*The tide gauge station in Koper was first set up in 1958 (modernized in 2002) by the Slovenian Environment Agency (ARSO). Besides the recording of **mean sea level** and **sea water temperature**, the modern tide gauge station also provides precise meteorological data :*

- *wind speed and direction,*
- *air pressure, air temperature and*
- *humidity.*

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Piran, 17 March 2017

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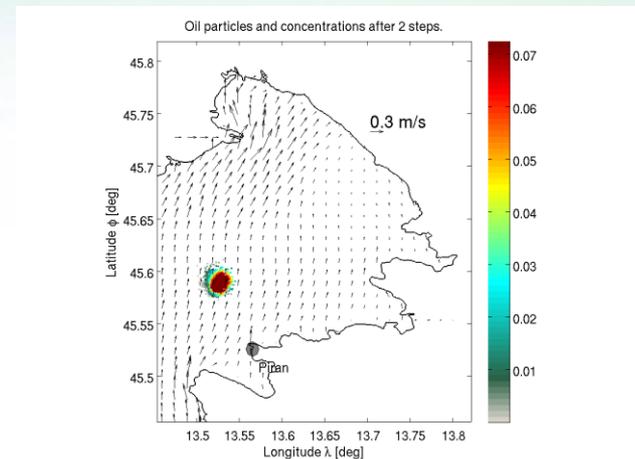
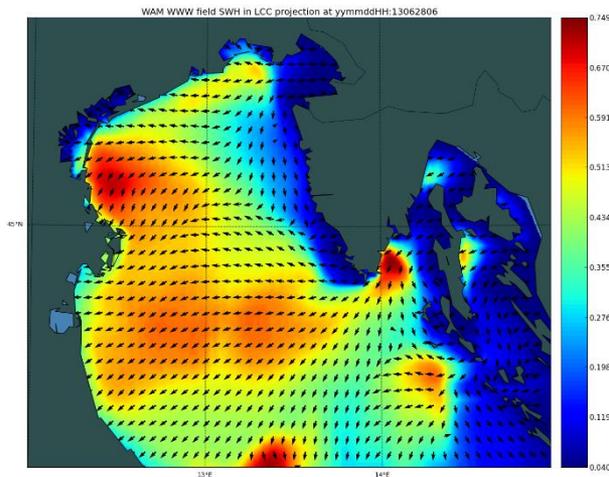


Two Oceanographic buoys: „Zora“ and „Zarja“.



## Numerical modeling (Forecast and 3D ocean models)

- Waves,
- Tide,
- Sea currents, salinity, temperature,
- Oil spill spreading



## To conclude

- Basically all MBS observing system were setup after 2000 and were at least partially **co-financed by various EU projects**.
- **Cross border cooperation** is the only way to improve our knowledge about the marine environment of the Northern Adriatic and especially the Gulf of Trieste. We have learned this lesson from various project in the last two decades (Adricosm, ISMO, HAZADR).
- Cooperation with the Slovenian Environmental Agency has always been constructive especially when it concerns the hidrological monitoring of the coastal sea and introducing new technologies.
- Future activities will will for sure be oriented toward the improvement of data quality and explore the existing observing system better (machine to machine communication).
- Especially wave measurements are of great importance since in many cases it can significantly affect **protected areas** and have to be seriously considered in **Coastal Engineering**.

Thank you for your  
attention!