



Italian-Croatian Workshop

Spreading of the NAdDW in the Southern Adriatic in 2012

Venice, 3 June 2015



Italian-Croatian Workshop on Spreading of the NAdDW in the Southern Adriatic in 2012 - Venice, 3 June 2015

AGENDA

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| 09:00 | Registration and welcome coffee |
| 09:30 | Workshop opening (<i>Fabio Trincardi, Director of Institute of Marine Sciences</i>) |
| 09:40 | Results Overview I (Chairman: L. Langone) <ul style="list-style-type: none">- Dense water studies resulting from the exceptional winter of 2012 (<i>H. Mihanovic et al.</i>)- Response of the Adriatic Sea to an intense cold air outbreak: dense water dynamics and wave-induced transport during winter 2012 (<i>A. Benetazzo et al.</i>)- Dense water bottom currents in the Southern Adriatic Sea in spring 2012 (<i>J. Chiggiato et al.</i>)- Exploring the drivers for dense shelf water formation, migration and cascading in the SA (<i>D. Bonaldo et al.</i>) |
| 11:00 | Coffee Break |
| 11:20 | Results Overview II (Chairman: Vilibic) <ul style="list-style-type: none">- Dynamics of particles along the western margin of the Southern Adriatic: processes involved in transferring particulate matter to the deep basin (<i>L. Langone et al.</i>)- Role of the Mid-Adriatic Deep in dense water interception and modification (<i>M. Marini et al.</i>)- Recent studies on the Adriatic long-term changes as seen from Palagruza Sill series (<i>J. Vilibić et al.</i>)- New insights on the NAdDW pathway through the Mid-Adriatic depressions, the case study of 2014-2015 (<i>M. Bensi et al.</i>) |
| 12:40 | Lunch break |
| 14:00 | Discussion of possible collaborations between different groups (novel concepts, under-explored processes, available datasets, human resources and capabilities) |
| 15:30 | Potential next steps (Data policy, potential manuscripts, next meetings, bilateral projects, MoU) |
| 17:00 | Workshop closure |

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RATIONALE

In February 2012 the North Adriatic experienced a cold spell with a large decrease of surface temperature, associated with severe cold and dry Bora winds. The result was the formation of extremely dense shelf water, further promoted by the low discharge of the Po River in the preceding autumn.

CNR-ISMAR set up a rapid response experiment (Operation Dense Water, ODW) to study the occurrence, amount, timing and properties of the newly formed dense shelf water, expected to cascade in the Southern Adriatic in the following weeks after its migration southwards. The ODW experiment was designed with an integrated approach, including modelling simulations, mooring deployments and quick-response oceanographic cruises.

Since 2006 the OGS E2-M3A observatory, located in the centre of the south Adriatic depression, is used to study the long-term variability associated with large circulation modes, as well as the effects of dense water formation events in the south Adriatic.

IOF deployed two ADCPs in March 2012 along the Palagruža Sill and, through permanent monitoring programmes, performed a number of cruises at the sill and in coastal Croatian waters in winter and spring of 2012. In addition, permanent monitoring programmes along the sill have been executed for more than 60 years, providing an unique dataset for monitoring of the dense water dynamics and outflow towards the southeast.

Numerical modelling experiments were executed by a number of research groups with different atmosphere-ocean modelling systems (ROMS/Aladin, COAWST), aiming for reproduction of the dense water formation during the 2012 event.

Overall, experiments allowed us to obtain much information about properties and amount of the newly formed North Adriatic Dense Water (NAdDW), as well as pathways and timing of transfer toward the Southern Adriatic Sea. However, it was not sufficiently investigated the vein of dense water coming from the overflow of the Middle Adriatic through the Palagruža Sill. In contrast, both numerical simulations and geological evidences in our possession suggested that this vein is quantitatively significant.

In March 2014 and April 2015, two oceanographic cruises were conducted jointly by CNR-ISMAR, IOF and OGS, acquiring CTD, LADCP and microstructure profiles along transects between the Palagruža Sill and the northern slope of the South Adriatic, deploying a deep mooring in Croatian waters to obtain a one-year time series of physical and dynamical characteristics of the water masses, and investigating the particle flux and composition along the probable pathway of the dense water coming from the Central Adriatic.

The workshop aims at providing a summary of the results achieved so far and explore the possibility of gaining added value by bringing together data and scientists from the different groups, to further explore aspects of the processes that are still poorly understood.

Scientific Committee: *Leonardo Langone, Sandro Carniel, Ivica Vilibic, Hrvoje Mihanovic, Manuel Bensi*

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Acknowledgments

Experimental works was supported by projects EU-Hermione, EU-Coconet, RITMARE, FIRB "Decalogo", Croatian Monitoring Programme. We acknowledge cruise participants, Captains and crew members of the R/Vs Urania, G. Dallaporta, Pasquale e Cristina, Minerva Uno, Attila and BIOS DVA.

The workshop was organized in the framework of the action SP5_WP3_AZ3, "Setup of a relocatable marine observing system" of the RITMARE National Flagship Project.

Special thanks to Magda Casarin, who helped in the workshop organization.