THE IEO-OS IN THE MEDITERRANEAN SEA: CONTRIBUTIONS OF THE RADMED MONITORING PROGRAM TO THE KNOWLEDGE OF THE SYSTEM.

Balbín R., García-Martínez M.C., Aparicio-Gonzalez A., Cainzos V., Jiménez-Aparicio J.A., Martin-Quetglas M., Melguizo J., Mena C., Moya F., Piñeiro S., Santiago R., Serra M., Tel E., Vargas-Yáñez M.
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EOOS European Ocean Observing System

An Observing System (OS) can be seen as a factory operating continously. The products and results obtained from the OS allow its own re-desing and update improving its functioning. One of the main objectives of these monitoring systems is to provide statistics (mean values, variability ranges, etc.) that can be used for the description of environmental status, scientific works, detect alterations (human induced or not), initialize numerical models, etc.

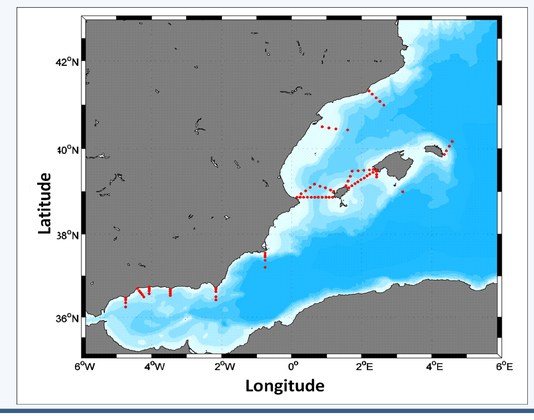
The Spanish Mediterranean Observing System (RADMED) in its actual design was initiated in 2007, unifying and extending previous programs: ECOMÁLAGA, initiated in 1992 in the area of the Málaga Bay, ECOBALEARES, initiated in 1994 to the south of Mallorca Island, and ECOMURCIA and CIRBAL to the south of Cape Palos and in the Balearic Channels respectively, initiated in 1996.

OS design

- Based on scientific knowledge
- Technical requirements
- Sustainable funding
- Multidisciplinar: bio-physical-chemical sampling
- Laboratory analysis requeriments must be considered
- Only is effective if data are obtained and analyzed in a reasonable period of time
- Results dissemination
- Data bases
- Coordination

RADMED Observing System

- Four surveys per year, one per season
- Funded by Instituto Español of Oceanography (IEO)
- Multidisciplinar: temperature, salinity, oxygen, inorganic nutrients, chlorophyll, phytoplankton (micro and pico), zooplankton, CO_2 ,…
- Data bases: EMODNET, Centro de Datos Oceanográficos del IEO,…
- Coordination: IEO-OS, MONGOOS, EUROGOOS



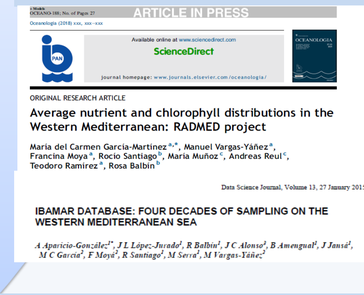
Revision and update

OS at work

- Feedback and improvement
- Permanent revision of the system
- Inclusion of new variables
- Generation of scientific knowledge

Products *

Environmental status and trends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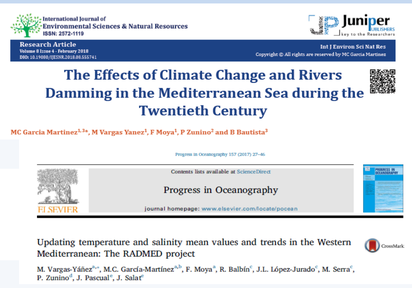
ORIGINAL RESEARCH ARTICLE
Average nutrient and chlorophyll distributions in the Western Mediterranean: RADMED project
María del Carmen García-Martínez [a,*], Manuel Vargas-Yáñez [a], Francina Moya [a], Rocío Santiago [b], María Muñoz [a], Andreas Reul [c], Teodoro Ramírez [a], Rosa Balbín [b]


International Journal of Environmental Sciences & Natural Resources
ISSN: 2572-1119
Research Article
Volume 8 Issue 4 - February 2018
Int J Environ Sci Nat Res
The Effects of Climate Change and Rivers Damming in the Mediterranean Sea during the Twentieth Century
MC García Martínez [1,2*], M Vargas Yanez [1], F Moya [1], P Zunino [2] and B Bautista [3]

Progress in Oceanography 157 (2017) 27–46
Contents lists available at ScienceDirect
Progress in Oceanography
journal homepage: www.elsevier.com/locate/pocean
Updating temperature and salinity mean values and trends in the Western Mediterranean: The RADMED project
M. Vargas-Yáñez [a,*], M.C. García-Martínez [a,b], F. Moya [a], R. Balbín [a], J.L. López-Jurado [a], M. Serra [a], P. Zunino [a], J. Pascual [a], J. Salat [a]


Data Science Journal, Volume 13, 27 January 2015
IBAMAR DATABASE: FOUR DECADES OF SAMPLING ON THE WESTERN MEDITERRANEAN SEA
A. Aparicio-González [1*], J L López-Jurado [1], R Balbín [1], J C Alonso [1], B Amengual [1], J Jansá [1], M C García [1], F Moya [1], R Santiago [1], M Serra [1], M Vargas-Yáñez [1]

Relation of environmental factors with fisheries

Mediterranean Marine Science
Indexed in WoS (Web of Science, ISI Thomson)
The journal is available on line at http://www.medit-mar-sc.net
Research Article
Fisheries and reproductive biology of *Octopus vulgaris* (Mollusca: Cephalopoda) in the Gulf of Alicante (Northwestern Mediterranean)
M. GONZÁLEZ [1], E. BARCALA [2], J.-L. PÉREZ-GIL [1], M.N. CARRASCO [1] and M.C. GARCÍA-MARTÍNEZ [1]


Commentary
http://www.alliedacademies.org/journal-fisheries-research/
Short comment about the octopus life cycle in the northern Alboran Sea (western Mediterranean Sea).
María del Carmen García-Martínez [1,2*], Francina Moya [1], María Gonzalez [1,2], Pedro Torres [1], Sara Farzaneh [1], Manuel Vargas-Yanez [1]
Journal of Natural History, 2015
ttp://dx.doi.org/10.1080/00222933.2014.1001457
Taylor & Francis
Spatial distribution of ichthyofauna in the northern Alboran Sea (western Mediterranean)
Cristina García-Ruiz [1*], Domingo Lloris [1], José Luis Rueda [1], M. Carmen García-Martínez [1] and Luis Gil de Sola [1]

Maritime Spatial Planning (MSP)


Marine Environmental Research 126 (2007) 45–68
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Marine Environmental Research
journal homepage: www.elsevier.com/locate/marenvrev
Fertilization and connectivity in the Garrucha Canyon (SE-Spain) implications for Marine Spatial Planning


water
MDPI
Article
Oceanographic and Bathymetric Features as the Target for Pelagic MPA Design: A Case Study on the Cape of Gata
María Muñoz [1,*], Andreas Reul [1], María del Carmen García-Martínez [2], Francisco Plaza [3], Begoña Bautista [1], Francina Moya [2] and Manuel Vargas-Yáñez [2]

* Climatologies

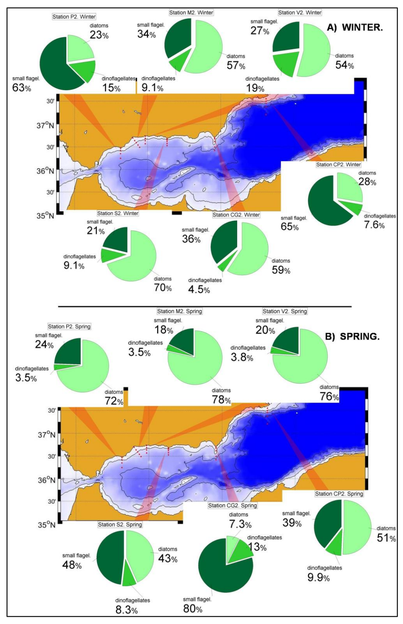
P2 station. Chlorophyll-a (mg/m^3) | standard deviation | number of data												
m	Winter			Spring			Summer			Autumn		
0	1.13	0.97	18	1.13	0.93	20	0.51	0.33	16	1.11	1.50	20
10	1.02	0.71	18	1.42	1.02	21	0.90	0.66	18	0.86	0.81	19
20	0.85	0.57	18	1.24	0.86	21	0.98	0.68	18	0.64	0.35	18
50	0.36	0.30	17	0.41	0.24	20	0.53	0.30	18	0.38	0.29	20
75	0.31	0.26	16	0.30	0.16	19	0.39	0.24	17	0.26	0.21	18
100	0.37	0.41	16	0.30	0.26	20	0.35	0.36	17	0.27	0.30	18

P2 station. Dissolved Oxygen (ml/L) | standard deviation | number of data												
m	Winter			Spring			Summer			Autumn		
0	5.41	0.42	17	5.41	0.44	16	5.59	0.58	14	5.34	0.42	19
10	5.36	0.51	17	5.25	0.49	16	5.51	0.69	14	5.27	0.46	19
20	5.15	0.47	17	4.97	0.64	16	5.15	0.62	15	5.00	0.56	19
50	4.85	0.45	17	4.55	0.44	16	4.36	0.39	15	4.66	0.51	19
75	4.81	0.50	16	4.60	0.52	16	4.50	0.55	15	4.67	0.32	19
100	4.89	0.61	14	4.83	0.72	16	4.66	0.68	15	4.76	0.52	19
130	4.46	0.28	4	4.47	0.58	4	4.43	0.47	7	4.50	0.31	9

P2 station. Nitrate (µM) | standard deviation | number of data												
m	Winter			Spring			Summer			Autumn		
0	0.86	0.71	15	0.87	0.98	15	0.20	0.26	17	0.53	0.75	16
10	0.97	0.71	14	1.39	1.26	15	0.33	0.60	16	1.09	1.50	16
20	1.88	1.79	15	2.33	1.60	15	1.08	1.65	17	1.69	1.73	16
50	3.46	1.71	15	4.43	1.80	16	4.40	2.45	17	4.51	2.55	16
75	4.17	1.70	15	5.31	1.82	16	4.94	2.22	17	5.56	1.89	16
100	4.78	1.74	15	5.76	1.87	16	5.80	1.93	17	6.33	1.63	16
130	4.86	2.20	9	6.87	1.33	6	6.67	1.72	9	7.27	1.77	9

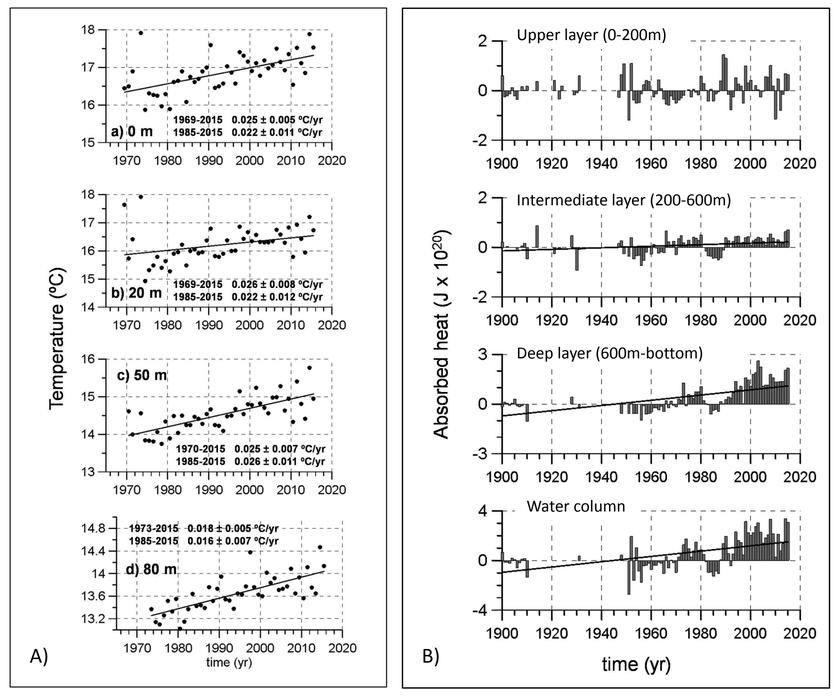
P2 station. Phosphate (µM) | standard deviation | number of data												
m	Winter			Spring			Summer			Autumn		
0	0.11	0.05	15	0.11	0.06	16	0.08	0.04	17	0.10	0.10	16
10	0.11	0.04	14	0.16	0.13	16	0.09	0.06	17	0.11	0.08	16
20	0.14	0.05	14	0.17	0.09	16	0.12	0.07	17	0.15	0.12	16
50	0.20	0.09	15	0.27	0.11	16	0.25	0.11	17	0.30	0.17	16
75	0.23	0.10	15	0.29	0.11	16	0.26	0.11	17	0.31	0.10	15
100	0.25	0.10	15	0.30	0.12	16	0.28	0.10	17	0.31	0.06	15
130	0.22	0.11	9	0.32	0.12	6	0.32	0.09	9	0.31	0.07	9

Seasonal mean chlorophyll-a, dissolved oxygen, nitrate and phosphate, including standard deviation and the number of data used for each calulation, for the westernmost station of Alboran Sea. These tables have been constructed for all the area covered by RADMED sampling and are available at: https://www.sciencedirect.com/science/article/pii/S0078323418300939#sec0055
García-Martínez, M.C., Vargas-Yáñez, M., Moya, F., Santiago, R., Muñoz, M., Reul, A., Ramírez, T., Balbín, R. 2018. Oceanologia. https://doi.org/10.1016/j.oceano.2018.08.003



Relative abundances of phytoplankton expresed as percentages for the Alboran Sea and Cape Palos for diatoms (light green), small flagelates (dark green) and dinoflagellates (intermediate green) integrated from the surface to 100m.
García-Martínez, M.C., Vargas-Yáñez, M., Moya, F., Santiago, R., Reul, A., Muñoz, M., López-Jurado, J.L., Balbín, R. Spatial and temporal long term patterns of phyto and zooplankton in the W-Mediterranean: RADMED project. Progress in Oceanography (under review)

* Trends



A)Temperature time series at 0, 20, 50 and 80 m depth for the Northern sector of Western Mediterranean.
B) Heat absorbed at different layers of Western Mediterranean Sea (RADMED area)
Vargas-Yáñez, M., García-Martínez, M.C., Moya, F., Balbín, R., López-Jurado, J.L., Serra, M., Zunino, P., Pascual, J., Salat.J. Updating temperature and salinity climatologies and trends in the Western Mediterranean: RADMED project. 2017. Progress in Oceanography 157, 27-46 https://dx.doi.org/10.1016/j.pocean.2017.09.004