

#FRIDAYTALK

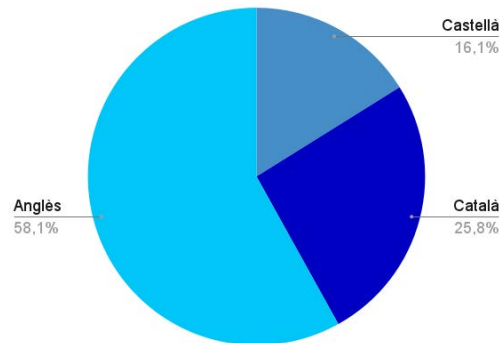
***Xerrades
del divendres
a l'ICM***

ANY 2021

RESUM

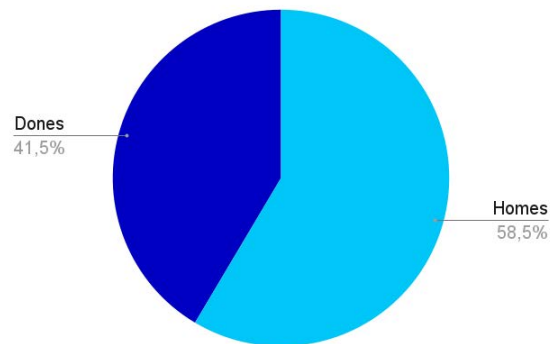
L'any 2021, es van celebrar **31 xerrades** del divendres "Friday Talks". Seguint els protocols de pandèmia, es va començar l'any amb xerrades online (22 xerrades), i al novembre les vam començar a fer en format mixt, amb el presentador i part del públic a la Sala Ramon Margalef, i prop de la meitat dels assistents connectats remotament. L'assistència va variar d'un mínim de 25 persones a un màxim de 320 (del nostre mediàtic company Turiel), amb una mitjana i mediana de 57 i 46 assistents, respectivament.

Idioma	
Català	8
Castellà	5
Anglès	18

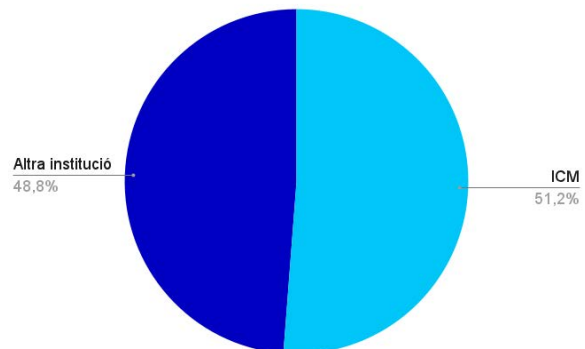


A les 31 xerrades hi va a ver **41 ponents** (a les xerrades de presentació de projectes hi intervenen múltiples persones)

Gènere	
Dona	17
Home	24



Institució	
ICM	21
Altres	20



ÍNDEX

Carles Borrego	Institut d'Ecologia Aquàtica, Universitat de Girona	<i>50 anys d'ecologia microbiana al Sistema Lacustre de Banyoles: del microscopi a l'ADN</i>	6
Pedro Cermeño Eulàlia Gràcia Dolors Vaqué	Institut de Ciències del Mar	<i>Presentation of research projects initiated in 2020 - PRODIGIO, STRENGTH, DIVAS</i>	8
Sheree Yau	Observatoire Océanologique de Banyuls- sur-Mer, France	<i>Finding the genetic basis for algae–virus interactions and evolution</i>	10
Juan Carlos Ruiz Cabeza	Aigües de Barcelona, Empresa Metropolitana del Cicle Integral de l'Aigua	<i>Sanejament d'aigües residuals a l'àmbit metropolità</i>	12
Antonio Vilaseñor	Departament de Geociències Marines, ICM	<i>Use of submarine telecommunication cables for seafloor observation and monitoring of natural hazards</i>	14
Marta Coll Josep Lluís Pelegrí Manuel Dall'Osto Arantxa Ugalde	Institut de Ciències del Mar	<i>Presentation of research projects initiated in 2020 - FutureMARES, CLIMATE-COVID, POLAR-CHANGE, ATLANTIS</i>	16
Josep Lloret	Director de la Càtedra Oceans i Salut Humana, Universitat de Girona	<i>Oceans i Salut Humana: una temàtica interdisciplinària per estudiar les relacions entre els ecosistemes marins i la salut de les persones</i>	18
Laura Villanueva	Royal Netherlands Institute for Sea Research (NIOZ), The Netherlands	<i>Microbial lipids: From paleoclimate to evolution and beyond "</i>	20
Julián Cerón	Institut d'Investigació Biomèdica de Bellvitge, IDIBELL	<i>Divulgación en tiempos de pandemia: la COVID-19 explicada con fútbol</i>	22
Cristina Romera- Castillo Francesc Piferrer Carolina Gabarró Enrique Isla	Institut de Ciències del Mar	<i>Presentation of research projects initiated in 2020 - COLPLAI, EPIPURE, ICE-MOD, RAP</i>	24
Elena Sarropoulou	Hellenic Centre for Marine Research, Greece	<i>The importance of small RNAs during development and reproduction</i>	26

Pere Puig	Departament de Geociències Marines, ICM	<i>Deep-sea Marine Animal Forests surrounded by fishing grounds in the Blanes Canyon</i>	28
Pere Abelló Verònica López	Institut de Ciències del Mar Monverte Estudis Ambientals	<i>El cranc blau a la Mediterrània: problemàtica i estat actual al Delta de l'Ebre</i>	30
Jean-Baptiste Jouffray	Stockholm Resilience Centre, Stockholm University, Sweden	<i>The Anthropocene ocean - Risks and opportunities for global sustainability</i>	32
Emili García-Ladona	Departament d'Oceanografia Física i Tecnològica, ICM	<i>COSMO, MEDOSMOSIS, SHAREMED, BlueNetCat,... full de ruta cap a una IDE marina</i>	34
Estefania Rodríguez	American Museum of Natural History, New York, US	<i>Diversity and evolution of marine invertebrates: Anthozoa (Cnidaria) as a case study</i>	36
Marta Coll	Departament de Recursos Marins Renovables, ICM	<i>Winners, losers and shifts of the pelagic ecosystem in the western Mediterranean Sea: integrating knowledge and projecting trajectories of change</i>	38
Anna Sànchez-Vidal	Facultat de Ciències de la Terra, Universitat de Barcelona	<i>Surfing for Science: una iniciativa de ciència ciutadana per afinar el balanç de plàstic als oceans</i>	40
Sílvia Donoso María Gracia Puga Esther Garcés	Institut de Ciències del Mar	<i>El compromís de l'ICM per la igualtat de gènere: presentació del primer Pla d'Igualtat</i>	42
Ligia Collado-Vides	Department of Biological Sciences, Florida International University, US	<i>Macroalgal blooms: a global dimension problem</i>	44
Lionel Renault	University of Toulouse, France & University of California, Los Angeles, US	<i>Fine scale oceanic and atmospheric processes: impacts on ocean dynamics and biogeochemical variability</i>	46
Andrea G. Bravo	Departament de Biologia Marina i Oceanografia, ICM	<i>Mercury: biogeochemistry and impact in the global ocean</i>	48
Francesco Colizzi	Departament de Biologia Marina i Oceanografia, ICM	<i>Biomolecular simulations à la carte: from biomedical to marine sciences</i>	50

Jordi Bascompte	University of Zurich, Switzerland	<i>The architecture of biodiversity</i>	52
Jeymmy Walteros Rodríguez	Universidad Tecnológica de Pereira, Colombia	<i>Relación ciudadano-río: una mirada desde la ciencia ciudadana en Colombia y Cataluña</i>	54
Laia Romero Suso Peña Izquierdo	Lobelia Earth, Parc Tecnològic, Barcelona	<i>Lobelia, bringing climate science closer to society</i>	56
Antonio Turiel	Departament d'Oceanografia Física i Tecnològica, ICM	<i>El futur de l'energia: els anys decisius</i>	58
Francisco Ramírez	Departament de Recursos Marins Renovables, ICM	<i>SOS océanos: un espacio operativo seguro (Safe Operating Space) para especies y ecosistemas marinos altamente impactados</i>	60
Ricardo Amils	Centro de Astrobiología (CSIC), Centro de Biología Molecular (UAM)	<i>La geomicrobiología de un sistema gaiano: el subsuelo profundo</i>	62
Mikel Rodríguez Hidalgo	Mikelgraphicscience	<i>Sumérgete en la web interactiva PlanctON</i>	64
Enric Pallàs-Sanz	Centro de Investigación Científica y de Educación Superior de Ensenada, Baja California, México	<i>Observations of mesoscale and submesoscale phenomenology in the Gulf of Mexico using gliders</i>	66

50 anys d'ecologia microbiana al Sistema Lacustre de Banyoles: del microscopi a l'ADN

Dr. Carles Borrego

Institut d'Ecologia Aquàtica, Universitat de Girona

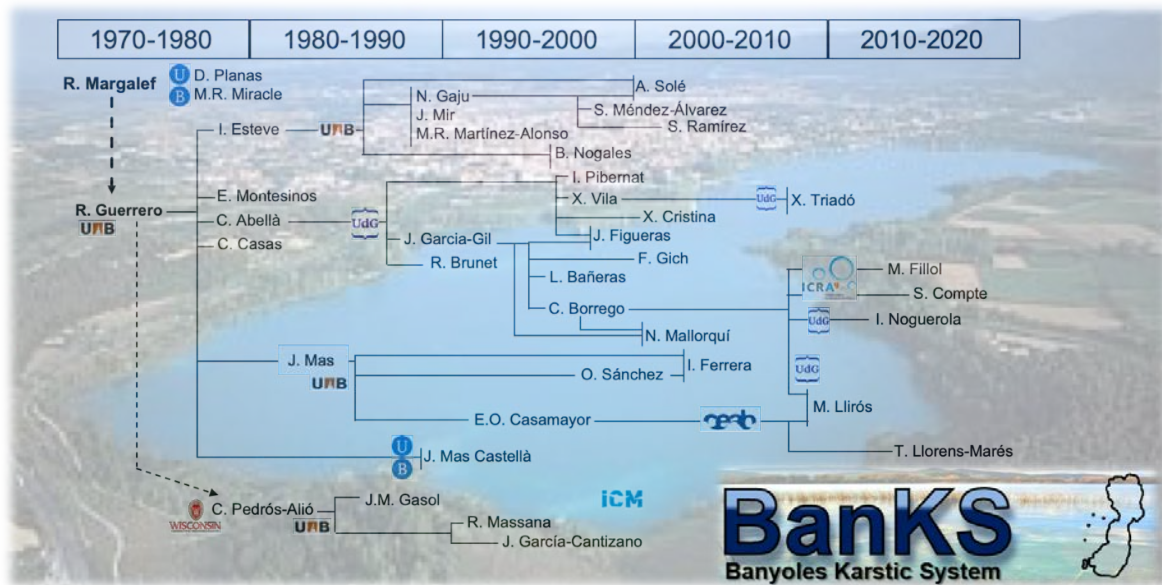
Divendres, 22 de gener de 2021

Resum

Traçar l'origen dels estudis en ecologia microbiana a la zona lacustre de Banyoles ens porta, com no podia ser d'altra manera, al professor Ramon Margalef. Va ser ell qui, amb els treballs seminals sobre el fito- i el zooplàncton de l'estany de Banyoles realitzats per la Dra. Dolors Planas al 1972 i la Dra. Maria Rosa Miracle al 1974 va obrir una línia d'investigació que s'ha mantingut ininterrompuda fins als nostres dies. A finals dels anys setanta i principis dels vuitanta, el professor Ricard Guerrero i el seu grup de recerca de la UAB van portar a terme els primers estudis sobre dinàmica poblacional i fisiologia del bacterioplàncton a l'Estany i estanyols de la zona. Una vegada inoculat el germen, la infecció va progressar ràpidament i va afectar diverses generacions d'ecòlegs microbians, que, des de diferents focus infectius (UdG, UB, UAB, ICM, CEAB), van continuar investigant per resoldre qüestions que uns anys abans eren, per motius tècnics i metodològics, inimaginables. Aquesta xerrada vol donar una visió general i no exhaustiva de com ha canviat la manera d'estudiar la microbiologia del sistema càrstic de Banyoles en els últims cinquanta anys (1970–2020).

Breu biografia

Carles Borrego és professor Titular de Microbiologia a la UdG des de 2001 i Professor d'Investigació al Institut Català de Recerca de l'Aigua (ICRA) des de desembre de 2011. És ecòleg microbià amb experiència en l'estudi de les comunitats microbianes de les aigües continentals i, particularment, dels sistemes càrstics. La seva trajectòria professional ha passat per tres etapes: una primera (1990–2000) en la que va investigar els mecanismes de fotoadaptació dels bacteris fotosintètics verds del sofre; una segona (2001-2011) centrada en els arqueus lacustres i la seva implicació en els cicles biogeoquímics; i una tercera (2012-actualitat) en la que s'ha dedicat a estudiar la dimensió ambiental de la resistència als antibiòtics, tant en sistemes aquàtics naturals (rius, aqüífers) com artificials (depuradores, col·lectors). Forma part del grup de treball de Medi Ambient encarregat de redactar el "Plan Nacional del Resistencias a Antimicrobianos (PRAN 2019-2021)" i de l'equip que coordina la xarxa de vigilància del SARS-CoV-2 en aigües residuals de Catalunya.



Filogenia dels estudiants de doctorat sorgits a partir de l'ancestre comú (el professor R. Guerrero) al llarg dels darrers cinquanta anys. Només es mostren les tesis doctorals que tenen a veure amb el sistema lacustre de Banyoles. La llargada de les branques és arbitrària i només indica relació entre el director i el doctorand sense cap mena de relació filogenètica real en el temps.

References

- Borrego, C. 2020. Ecologia microbiana al sistema lacustre de Banyoles: del microscopi al DNA. A: Ramon Margalef López (1919-2004). El científic impulsor de l'ecologia a l'estany de Banyoles. Gich, F.; Sarquella, S. (ed.) Banyoles: CECB, p. 155-173. (Quaderns; 39)

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=b7f5f0e5923f17183478d55ab468f41c51f47926-1611313206044>

Presentation of research projects initiated in 2020 - 1st session

PRODIGIO (Cermeño), STRENGTH (Gràcia), DIVAS (Vaqué)

Divendres, 29 de gener de 2021

PRODIGIO: Developing early-warning systems for improved microalgae production and anaerobic digestion - Pedro Cermeño

Starting date 01/01/2021. Duration in months 36. Call identifier H2020-LC-SC3-2020-RES-RIA

Process monitoring is a crucial task for bioprocess optimization and will play a decisive role in the digitization of future bio-based production systems. System failure prediction technologies must be an integral part of monitoring schemes; however, these technologies are underdeveloped as far as the bioenergy industry is concerned. The objective of PRODIGIO is to establish a base of knowledge for the development of system failure prediction technologies that increase the performance of microalgae production and anaerobic digestion systems and advance towards more favourable techno-economic, environmental and social performance to achieve more sustainable microalgae biogas. By combining perturbation experiments in bioreactor systems and cutting-edge methods for big data analysis, PRODIGIO will decode the triggers, identify early-warnings, define threshold values, and calculate warning times for critical state transitions in bioreactors. Taking into account processes inefficiencies, we estimate that, along with the implementation of prevention countermeasures, PRODIGIO technology could contribute to increasing resource and energy efficiencies >50% throughout the production chain, which would translate into OPEX savings and GHG emissions reduction. The technological solutions that will derive from the project, such as a catalog of early warning signals for the failure of microalgae biomass production and conversion-to-biogas systems, will be pre-commercial in nature; however, a roadmap will be compiled and updated during the course of the project that will identify priority research lines for further development and future implementation of technology. The results of PRODIGIO will pave the way for moving the entire microalgae biogas production chain efficiently towards its theoretical maximum, enabling the development of a fully integrated and truly sustainable microalgae biogas production industry and contributing to strengthening the EU's leadership in renewable fuel technologies.

STRENGTH: Structure, seismicity and growth of active faults in the Alboran Sea through very-high resolution technologies and related hazard - Eulàlia Gràcia & Héctor Perea

Starting date 01/06/2020. Duration in months 36. Call identifier PID2019-104668RB-I00

Great earthquakes and the possibility to generate destructive tsunamis are geohazards of societal concern, as they may impact world economies, disturb submarine structures and affect coastal populations with the associated risk for local communities. We still have in our mind catastrophic episodes, such as the large events of the Sumatra earthquake and tsunami in 2004 in the Indian Ocean of magnitude (Mw) 8.7, and the Tohoku-Oki earthquake and tsunami in 2011 in the NW of Japan of magnitude (Mw) 9.1. Nevertheless, seismic events of moderate to large magnitude

in areas of low to moderate tectonic deformation with long recurrence intervals (Mw 6-7.3), will have a significant effect. The Alboran Sea is a Neogene basin located between the Iberian and Nubia plates. Miocene deformation related to the slab roll-back of the Tethys oceanic lithosphere was followed by a compressive regime that lasted from the Pliocene to today, including the development of strike-slip and thrust fault systems. Seismicity is characterized by earthquakes of low to moderate magnitude, although large historical (MSK VIII-X) and instrumental earthquakes occurred in this region. On the 25th January 2016, a Mw 6.4 earthquake hit the area offshore the city of Al-Hoceima in the Moroccan coast. It was the largest event ever recorded in the area. The source of the 2016 seismic event is the Al-Idrissi Fault System (AIFS), a 100-km-long crustal-scale boundary with left-lateral strike-slip displacement. The occurrence of the Mw 6.4 earthquake supports that the AIFS is currently growing through the propagation and linkage of their segments (Gràcia et al., 2019). The STRENGTH project will have national and international impact on the Marine Geosciences community. The outcome in the frame of this project will allow a significant progress by introducing advanced techniques to obtain micro-bathymetries using the AUV "IdefX", seafloor images acquired by the ROV "Liropus" and obtaining realistic models of seismic hazard and tsunami modelling.

DIVAS: Temporal trends of planktonic viruses in an oligotrophic coastal system - PIs: Dolors Vaqué & Ramon Massana

Starting date 01/06/2020. Duration in months 36. Call identifier PID2019-108457RB-I00

Viruses are key players in the functioning of microbial food webs, affecting all biogeochemical cycles, microbial metabolisms, and each infection has the potential to introduce new genetic information into the cell or progeny viruses, thereby driving genetic remodelling of both host and viral populations. The improvement in methods for counting viral abundance and to study their diversity have allowed progress in understanding the ecology and spatial distribution of viruses in the ocean. However, there is a lack of knowledge about the temporal patterns of viral abundance, diversity and the impact on their hosts (virus-host interactions) in the sea. To perform these studies, it is necessary the availability of time series. Since 2001, there has been a continuous monthly monitoring of microbial abundances, diversity and biogeochemical functions in the Blanes Bay Microbial Observatory (BBMO), appropriate for the present proposal. The main goal of DIVAS is to detect, within the context of the BBMO time series, the existence of recurrent seasonal and interannual patterns in viral abundance, viral diversity and virus-host interactions. We will also identify specific viruses infecting dominant prokaryotic and picoeukaryotic by single cell genomic analyses, and their relative abundance over time will be investigated in environmental sequencing datasets (metaviromes and metagenomes). Finally, we will evaluate the temporal links of planktonic viruses with abiotic (light, temperature, salinity and nutrients) and biotic (abundance prokaryotes and protists, and diversity) parameters, how these affect and shape viral abundance community structure and virus-host interactions, and whether there is a hint relating viral ecology and climate change.

Link to the talk

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Finding the genetic basis for algae–virus interactions and evolution

Dr. Sheree Yau

Observatoire Océanologique de Banyuls-sur-Mer, France

Divendres, 5 de febrer de 2021

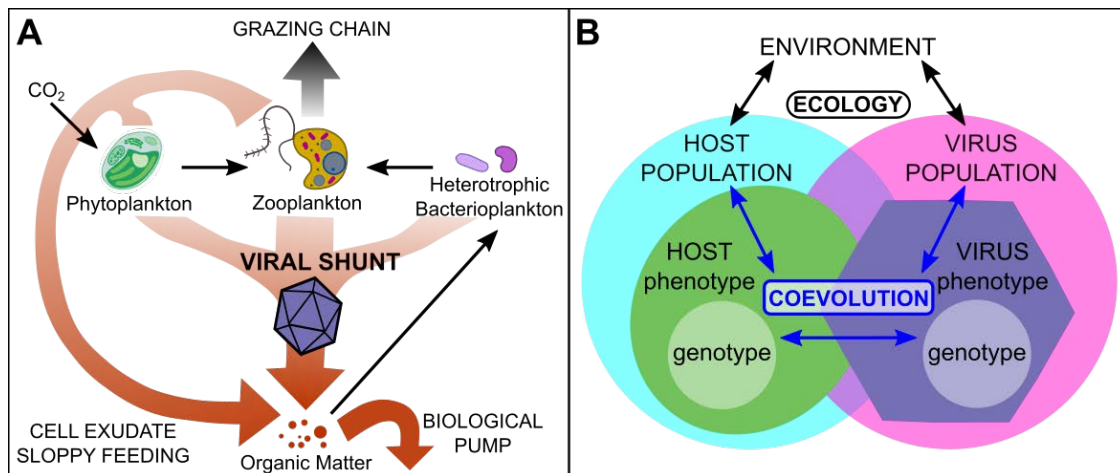
Summary

Viruses exert a major evolutionary force on their hosts, which has led to the emergence of host defensive and viral counter-defensive adaptations. Nowhere is this more evident than in the marine environment where 10^{23} viral infections to microbes are estimated to occur per second [1]. Viral lysis is an important contributor to the mortality of algae, which influences global nutrient cycles as phytoplankton contribute 50% of planetary primary production [2]. All known viruses that infect microscopic algae kill their host when they reproduce, releasing their viral offspring into the surrounding water. This is why it was surprising to find growing viruses in cultures of the marine green alga *Ostreococcus* [3]. As cultures started from a single cell, every cell should be identical to the others, so why were the susceptible cells not just killed-off by the virus and completely eliminated? By isolating susceptible and resistant single cells and tracking their growth both with and without viruses, my work has shown that some individuals occasionally changed between susceptible and resistant states. Few susceptible cells were enough to keep a growing viral population along-side a majority of viral-resistant algae. In *Ostreococcus*, host resistance to viruses was linked to rapid changes in the transcription pattern mainly restricted to one chromosome [4]. When cells switched between states, pieces would be lost from this chromosome, indicating it was these changes that helped cells to switch and that it functions as an “immunity chromosome”. A mathematic model describing the alga hedging its bets at each cell division—sometimes being susceptible and sometimes being resistant to viruses—matched what was seen in culture of algae and viruses multiplying together without any apparent drop in the overall population. Biologists often observe algal “bloom-and-bust” events, when algae form massive blooms that they can be visible from space but quickly die-off. This raises a big question: perhaps stable coexistence between algae and viruses is much more common, but it is simply not detected. I propose to study the genetic basis underlying algae–virus interactions by using *Ostreococcus* and its viruses as a model system with an approach integrating experimental evolution with joint host–virus genome-wide associations to determine the molecular bases of algae–virus coevolutionary dynamics both in the lab and in natural populations.

Brief biography

The common theme of my research is studying the function, ecology and evolution of microorganisms. I have worked at the level of single genes, single cells, populations and whole communities, using mainly "omics" technologies. My career began studying hydrocarbon-degrading Mycobacteria and the genetics of antibiotic resistance at the University of Sydney, Australia. I was interested in the (then) new movement of metagenomics, leading to my PhD at the University of New South Wales on the microbial ecology of Antarctic lakes. My most important discovery was that

viruses act as the top predators in these lakes, as often multicellular life and unicellular grazers are rare or absent. This inspired me to continue studying host–virus interactions in environmental microorganisms, firstly as a post-doc in the Banyuls Oceanologic Observatory, France, then as a Juan de la Cierva Fellow at the Institute of Marine Sciences (ICM). I am now building on this theme as a CNRS (French National Centre for Scientific Research) researcher in the Evolutionary and Environmental Genomics of Phytoplankton (GENOPHY) group where I am focusing on interactions between marine green algae and viruses in the lab and the natural environment.



(A) A diagram of the marine microbial food web showing the “Viral Shunt” that diverts carbon away from higher trophic levels, either to be recycled into biomass by heterotrophic bacteria or sequestered in the deep ocean. Black arrows: uptake and trophic interactions. Brown arrows: free organic matter. (B) Diagram of ecological (black arrows) and coevolutionary (blue arrows) feedbacks showing how the genetic host–virus mechanisms interact with population variables (size and diversity) that have ecological consequences

References

- [1] Suttle, C.A. 2007. Marine viruses — major players in the global ecosystem. *Nat. Rev. Microbiol.* 5:801–12.
- [2] Field, C.B., Behrenfeld, M.J., Randerson, J.T. & Falkowski, P. 1998. Primary production of the biosphere: integrating terrestrial and oceanic components. *Science* (80-.). 281:237–40.
- [3] Yau, S., Krasovec, M., Rombauts, S., Groussin, M., Benites, L.F., Vancaester, E., et al. 2020. Virus-host coexistence in phytoplankton through the genomic lens. *Sci. Adv.* 6:eaay2587.
- [4] Yau, S., Hemon, C., Derelle, E., Moreau, H., Piganeau, G. & Grimsley, N. 2016. A viral immunity chromosome in the marine picoeukaryote, *Ostreococcus tauri*. *PLoS Pathog.* 12:1–25.

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<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1612521641052>

Sanejament d'aigües residuals a l'àmbit metropolità

Juan Carlos Ruiz Cabeza

Aigües de Barcelona, Empresa Metropolitana del Cicle Integral de l'Aigua, S.A.

Divendres, 12 de febrer de 2021

Summary

Aigües de Barcelona gestiona el cicle de l'aigua basant-se en l'excel·lència del servei i en la innovació constant. El nostre model de gestió públic-privat dona servei a gairebé 3 milions de persones de l'àrea metropolitana de Barcelona, essent una referència en l'àmbit internacional. A l'àrea metropolitana de Barcelona hi ha més de 3.000 km de col·lectors (uns 2700 km constitueixen la xarxa de clavegueram, de gestió municipal, i un 300 km la xarxa de transport en alta, de gestió metropolitana). Gairebé es porten 900.000 m³ d'aigües residuals diàriament. Els col·lectors interceptors recullen les aigües residuals procedents del clavegueram i les transporten per gravetat (si cal amb l'ajuda d'estacions de bombament) fins les estacions depuradores, on es fa el tractament de l'aigua residual que hi arriba. L'aigua tractada resultant d'aquest procés es retorna al medi o es reutilitza amb un tractament addicional anomenat regeneració. Els sistemes de sanejament es dissenyen per tractar la totalitat de les aigües residuals urbanes en temps de sec i per tractar les aigües residuals amb una dilució de les aigües d'escolament en temps de pluja; normalment, amb una capacitat de 3 a 5 vegades el cabal mig en temps sec, el cabal de dilució. En temps de pluja, un cop superat el cabal de dilució del sistema de sanejament, l'excedent d'aigua és evacuat al medi per diferents punts del sistema, anomenats sobreeixidors, el que s'anomena desbordaments dels sistemes de sanejament en temps de pluja; o més usualment DSS (descàrregues de sistemes de sanejament) o DSU (descàrregues de sistemes unitaris). Aquesta problemàtica és un dels principals impactes i reptes que es presenten en la gestió de les aigües i s'ha de tractar des d'una visió holística i integral.

Brief biography

Llicenciat en Ciències Químiques per la Universitat de Valladolid. Diplomant en Enginyeria Ambiental per l'Escola d'Organització Industrial (EOI) de Madrid i MBA en Gestió i Administració d'Empreses per la UNED. Més de 30 anys d'experiència en el sector de l'aigua; la major part de la meua trajectòria professional ha estat al món de la depuració d'aigües residuals, la regeneració d'aigües tractades i el sanejament. Ingresso en el Grup Suez España l'any 1991, i des de llavors he dirigit plantes depuradores i sistemes de sanejament en diverses geografies (País Basc, Catalunya, Illes Balears, Castella i Lleó). A l'any 2006 assumeixo la Direcció Tècnica de Depuració de la Direcció Territorial Centre-Nord-Canàries, i l'any 2007 començo un període internacional, per anar a treballar a Santiago de Xile, on vaig dirigir durant quatre anys l'EDAR de La Farfana. A la meua tornada, aterro novament a Barcelona al 2011 i, després d'un breu període a la Direcció de Medi Ambient de Suez Espanya, començo a treballar el 2012 a SGAB, que després va esdevenir en l'actual Aigües de Barcelona, com a Director Tècnic de Sanejament, a partir de 2016 com a Director de Col·lectors i

Drenatge a la Direcció d'Operacions, i recentment com a Responsable de Projectes de Transformació d'Ecofactories. A més assumeixo la Presidència de la Comissió Tècnica de Drenatge Urbà (Suez España), membre de la Comissió IV de Drenatge Urbà de l'Associació Espanyola d'Abastament i Sanejament (AEAS), i Coordinador i professor del Mòdul de Depuració d'Aigües Residuals i Regenerades dels màsters i dels cursos d'especialització en depuració d'aigües residuals en l'Escola de l'Aigua (Suez España).



Estació depuradora d'aigües residuals del Baix Llobregat

Figura informativa dels impactes de les DSUs

References

<https://www.aiguesdebarcelona.cat/l-aigua-teva-ciutat/com-es-gestiona-laigua/la-gestio-del-cicle-integral-de-laigua>

<https://www.amb.cat/es/web/ecologia/aigua/cicle-de-l-aigua>

<http://aca.gencat.cat/ca/laigua/gestio-del-cicle-de-laigua/depuracio-daigues-residuals/>

<https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp>

<http://www.life-effidrain.eu/en>

<http://www.projectbingo.eu/>

<http://www.resccue.eu/>

<https://www.tideway.london/>

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Use of submarine telecommunication cables for seafloor observation and monitoring of natural hazards

Dr. Antonio Villaseñor

Departament de Geociències Marines, Institut de Ciències del Mar

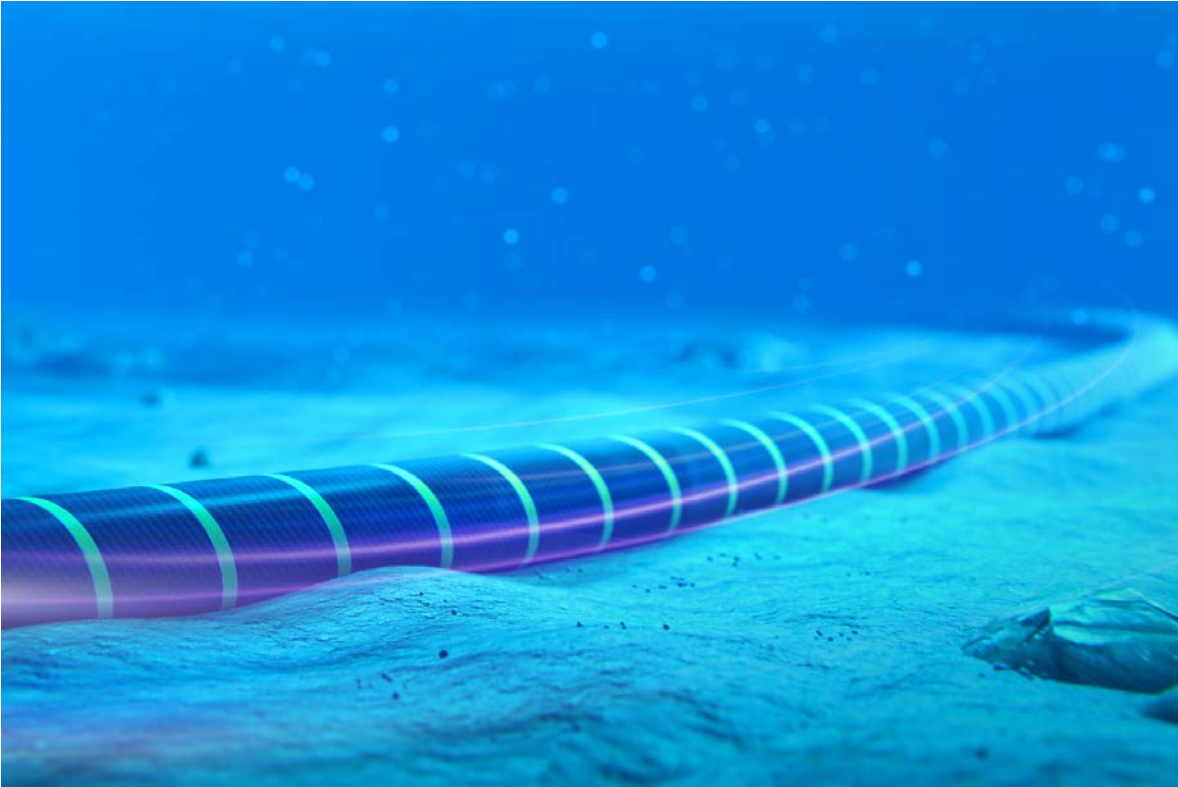
Divendres, 19 de febrer de 2021

Summary

A large network of millions of kilometers of communication cables is currently deployed on the ocean floor. However, the scientific potential of this network has not been yet exploited for scientific purposes, including monitoring effects of climate change on ocean currents, measuring seafloor deformation, seismicity, and changes in temperature and salinity. Existing tools for observing the oceans have their own limitations: satellites can only monitor surface patterns, Argo floats for measuring temperature and salinity have a limited depth range, DART buoys for tsunami monitoring are sparse and prone to malfunction. An emergent technology, DAS (distributed acoustic sensing), can exploit the available infrastructure of telecommunication cables to monitor the oceans and overcome some of the limitations of existing methods. A DAS interrogator unit probes a fiber optic cable with a coherent laser pulse and measures changes in the phase of the returning optical backscatter time-series. This allows to convert each 5-10 m segment of the cable into a deformation sensor, that can be used to record a variety of signals, including earthquakes, ocean waves and currents, marine mammals, ocean noise (e.g. ship traffic), etc.

Brief biography

Antonio Villaseñor is a staff scientist at the Spanish National Research Council's Institute of Marine Science (ICM-CSIC). He received his undergraduate and Ph.D. degree in Physics (1995) from the University of Barcelona, Spain. After postdoctoral stays at the U.S. Geological Survey (Golden, USA), University of Colorado (Boulder, USA) and University of Utrecht (The Netherlands) he joined CSIC in 2004, first at the Institute of Earth Sciences Jaume Almera, and since 2020 at ICM. His main research interests include the study of global instrumental seismicity and earthquake tomography. He has studied volcanic systems using local earthquake arrival times, the Eurasian continent using surface waves from earthquakes and correlations of ambient noise, and the entire Earth's mantle using teleseismic travel times. Currently he is also involved in the study of induced seismicity caused by fluid injection.



References

Lindsey, N. J., and E.X. Martin (2021). Fiber-Optic Seismology, *Annu. Rev. Earth Planet. Sci.*, 49, 309–36, doi: 10.1146/annurev-earth-072420-065213.

Williams, E. F., Fernández-Ruiz, M. R., Magalhaes, R., Vanthillo, R., Zhan, Z., González-Herráez, M., & Martins, H. F. (2019). Distributed sensing of microseisms and teleseisms with submarine dark fibers. *Nature Communications*, 10, 5778, doi:10.1038/s41467-019-13262-7.

Zhan, Z. (2020). Distributed Acoustic Sensing Turns Fiber - Optic Cables into Sensitive Seismic Antennas. *Seismological Research Letters*, 91(1), 1-15, doi:10.1785/0220190112

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1613730836784>

Presentation of research projects initiated in 2020 - 2nd session

FutureMARES (Coll), CLIMATE-COVID (Pelegrí), POLAR-CHANGE (Dall'Osto), ATLANTIS (Ugalde)

Divendres, 26 de febrer de 2021

FutureMARES: Climate change and future marine ecosystem services and biodiversity - Marta Coll

Starting date 01/09/2020. Duration in months 48. Call identifier H2020-LC-CLA-2019-2

Marine and transitional ecosystems provide fundamental climate regulation, food provisioning and cultural services. FutureMARES provides socially and economically viable nature-based solutions (NBS) for climate change (CC) adaptation and mitigation to safeguard these ecosystems' natural capital, biodiversity and services. The program advances understanding of the links between species and community traits, ecological functions and ecosystem services as impacted by CC by analysing the best available data from monitoring programs and conducting targeted experiments and beyond state-of-the-art modelling. Ensemble physical-biogeochemical projections will identify CC hotspots and refugia. Shifts in the distribution and productivity of keystone, structural and endangered species and the consequences for biodiversity will be projected within different CC-NBS scenarios to reveal potential ecological benefits, feedbacks and trade-offs. Novel, social-ecological vulnerability assessments will rank the severity of CC impacts on various ecosystem services and dependent human communities. Complementary analyses at realworld demonstration sites will inform managers and policy-makers on the economic costs and tradeoffs of NBS. These physical, ecological, social and economic analyses will be integrated to develop three, climate-ready NBS: i) restoration of habitat-forming species, ii) conservation actions explicitly considering the range of impacts of CC and other hazards on habitat suitability for biota to preserve the integrity of food webs (e.g. marine protected areas) and protect endangered, and iii) sustainable, ecosystem-based harvesting (capture and culture) of seafood. FutureMARES is co-developed with policy-makers and managers to ensure impactful and transformative cost-effective actions.

CLIMATE-COVID19: Cross-analysis of climatic and COVID19 data - Josep Lluís Pelegrí

Starting date 22/06/2020. Duration in months 18. Call identifier PIM-E-202030E222

This project explores the links between climate conditions and the onset and development of the COVID19 pandemic over the western Mediterranean, with special focus on Catalonia. The project uses COVID19 pandemic and atmospheric-oceanic data to study the correlations among the regional expansion a virus and the climatic conditions, with the objective of identifying how climate modulates the environmental conditions that may favor/limit the incidence, spread and persistence of viruses. The novelty of this approach lies on the combined climate-health analysis of large datasets, including recent and historical health and climate data, and its ulterior combination with long-term weather models such as to produce a credible virus-surge forecast.

POLAR-CHANGE: Aerosol emissions from polar changing environments - Manuel Dall'Osto

Starting date 01/06/2020. Duration in months 36. Call identifier PID2019-110288RB-I00

POLAR-CHANGE aims to study the sources, composition and dynamics of aerosols in Arctic and Antarctic environments. Using experimental approaches in the field and in the lab as well as state-of-the-art data analysis, POLAR-CHANGE intends to link aerosol emission processes with the polar marine biosphere and cryosphere. During this multidisciplinary project we will (1) put together aerosol size distribution data from a large international network of observations including 7 Arctic and 8 Antarctic research stations, (2) run extensive laboratory experiments with a seaspray aerosol chamber of our design, and (3) conduct an oceanographic cruise to productive waters of the eastern side of the Antarctic Peninsula and the Weddell Sea, where the overall hypotheses can be verified or falsified by open ocean ship-borne observations from both ocean and atmosphere. The cruise, which will gather an international team, will include a visit to pelagic and sympagic ecosystems with different dominant taxa and associated with different physico-chemical forcing. Our approach will be to synergistically use our competences in plankton ecology, ocean-atmosphere biogeochemistry and atmospheric chemistry in a project without precedent in the studied area.

ATLANTIS: Atlantic-North-Africa lithosphere three-dimensional imaging study - Arantza Ugalde

Starting date 01/06/2020. Duration in months 36. Call identifier PID2019-109559RB-I00

The main challenge of the ATLANTIS project is to develop a self-consistent three-dimensional model of the crustal and upper mantle structure of the Atlas mountain belt, from the westernmost part in the Atlantic Ocean to its easternmost end in Tunisia. Two new temporary seismic networks will be deployed during this project to cover the unmonitored areas. On the one hand, a marine seismic survey will be carried out in the Atlantic margin of the westernmost Atlas and, on the other hand, a temporary land seismic network will be deployed in Tunisia, at the easternmost end of the Atlas Mountains. The proposal will also take advantage of the extensive seismic waveform data sets available in North Africa from several projects and surveys, as well as from permanent stations in Morocco, Algeria and Tunisia. The proposed leading-edge methodologies are based on earthquake and ambient noise tomography, receiver function analysis, and seismic attenuation imaging. Using those highly improved observations and the integrated analysis of geological and other geophysical observables of continental and marine areas, we will update the characteristics of the lithospheric-scale structures and the geological domains. We aim at refining the existing conceptual models that define the contacts among geological domains in the current kinematic framework of collision between the Eurasian and African plates.

Link to the talk

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Oceans i Salut Humana: una temàtica interdisciplinària per estudiar les relacions entre els ecosistemes marins i la salut de les persones

Dr. Josep Lloret

Director de la Càtedra Oceans i Salut Humana, Universitat de Girona

Divendres, 5 de març de 2021

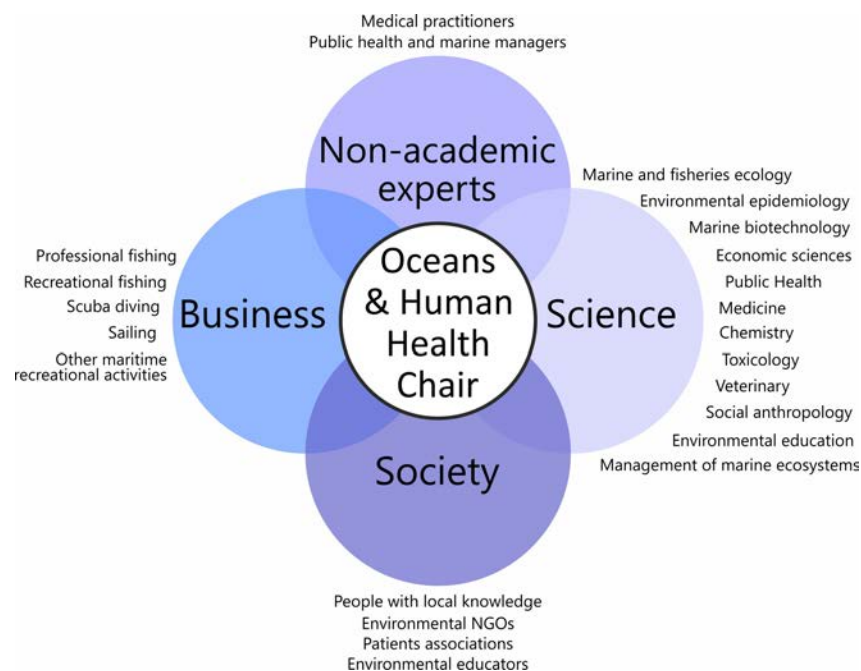
Resum

Els ecosistemes marins ens proporcionen diversos béns i serveis com són productes alimentaris saludables (recursos pesquers), noves medicines (espècies amb potencial bioactiu) i llocs per a l'esbarjo ("Espais blaus") que poden contribuir positivament a la salut física i mental de les persones sanes i malaltes, tant pel que fa al tractament de determinades malalties com el càncer com a la prevenció de malalties relacionades amb el risc cardiovascular, l'Alzheimer o la depressió. No obstant això, els mars i oceans comporten també riscos per a la salut (proliferacions d'algues tòxiques, paràsits dels peixos, etc). Actualment, els impactes de les societats modernes amenacen de fer disminuir o eliminar els beneficis i augmentar els riscos inherents als ecosistemes marins. Els estudis que relacionen els ecosistemes marins i la salut i benestar de les persones són encara escadussers i en aquest sentit existeix actualment una línia d'investigació interdisciplinària i innovadora anomenada "Oceans i Salut Humana" que intenta avançar en l'estudi d'aquestes relacions complexes. L'objectiu final és poder contribuir a la protecció dels ecosistemes marins per tal que aquests puguin continuar aportant els beneficis per a la salut de les persones i disminuir-ne els riscos. Aquests estudis són de gran actualitat sobretot a la Mar Mediterrània en el marc de la creixent Economia Blava (*Blue Economy*) i la Salut Blava (*Blue Health*). En aquest context, la Càtedra Oceans i Salut Humana (www.oceanshealth.udg.edu) va néixer el 2018 per aglutinar (per primer cop a Catalunya i Espanya) científics, metges i tècnics de diverses disciplines (biologia marina, medicina, veterinària, ciències socials, etc.) procedents de diferents centres de recerca, universitats i hospitals (UdG, CSIC, ISGLOBAL, Institut Català d'Oncologia, Hospital Clínic, etc.), l'administració, associacions de pacients i agrupacions empresarials (pescadors, peixaters, centres de busseig, etc.). Aquesta agrupació d'experts, amb una visió "bottom-up", transectorial, interdisciplinària i amb la participació dels ciutadans, permetrà avançar en la recerca i transferència de coneixements sobre la temàtica Oceans i Salut Humana.

Breu biografia

Josep Lloret (Doctor en Biologia, UB, 2000 i "Maîtrise" Oceanologia, Universitat de Perpinyà, 1994) és investigador a l'Institut d'Ecologia Aquàtica de la Universitat de Girona (UdG) i director del Grup de Recerca "Ecosistemes marins i Salut Humana" (SeaHealth) i de la Càtedra Oceans i Salut Humana, i membre del GRC *Ecologia de Comunitats Marines* de l'ICM-CSIC (2017 SGR 1023). Va iniciar la seva carrera científica a l'ICM i a l'Institute for Sea Fisheries d'Alemanya fa més de 25 anys,

i ha fet diferents estades a CNRS i IFREMER (França), NOAA-NMFS (USA), Universitat de Reykavik (Islàndia) i Universitat de Bogor (Indonèsia). Durant la seva carrera científica li han estat concedides 12 beques competitives, entre les quals 3 beques Marie Curie. Ha participat en més de 30 projectes d'investigació, dels quals n'ha estat investigador principal en més de la meitat. Ha publicat més de 70 articles inclosos en revistes indexades SCI, un llibre i 6 capítols de llibre, a més de 40 reports/informes. Ha participat en més de 40 congressos científics i ha realitzat treballs d'avaluació en més de 60 articles i ha efectuat més de 30 avaluacions de projectes de recerca, centres de recerca i beques postdoctorals per diferents organismes nacionals i internacionals. És editor científic a les revistes *Scientia Marina*, *Animal Biodiversity and Conservation* i *International Journal of Environmental Research and Public Health*. Té més de 10 anys d'experiència docent a la UdG, i ha dirigit 3 tesis doctorals. Les tasques d'investigació i docència es complementen amb diverses tasques d'avaluació i assessorament científic sobre recursos pesquers i reserves marines (STECF/UE, Parc Natural de Cap de Creus, etc). A més, ha portat a terme tasques de divulgació científica (premsa local i nacional, xerrades, reportatges, ràdio, TV i webs).



References

- Borja, A., White, M., Berdalet, E., Bock, N., Eatock, C., Kristensen, P., Lloret, J. et al. (2020) Moving towards an agenda on ocean health and human health in Europe. *Front Mar Sci* 7:1-19.
- García de Vinuesa, A., Demestre, M., Carreño, A., Lloret, J. (2021) The bioactive potential of trawl discard: Case study from a crinoid bed off Blanes (NW Mediterranean). *Mar Drugs*, 19: 83.
- Lloret J., Biton-Porsmoguer, S., Carreno, A., Di Franco A, Sahyoun, R. et al. (2020) Recreational and small-scale fisheries may pose a threat to vulnerable species in coastal and offshore waters of the western Mediterranean. *ICES Journal of Marine Science* 77(6):2255–2264

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1614940873235>

Microbial lipids: From paleoclimate to evolution and beyond

Dr. Laura Villanueva

Royal Netherlands Institute for Sea Research (NIOZ), Països Baixos

Divendres, 12 de març de 2021

Summary

Microbial lipids are essential cell components, which can form reserve compounds or be part of the membrane separating cells from their surroundings. Over the years, some of them have been used as biomarkers of the presence of their specific biological producers, and also of the physiological conditions of the cell¹. We are currently in the era of genomics, where genomes of microorganisms are providing key information of their metabolic, biotechnological potential and their evolutionary story. Nevertheless, the study of microbial lipids has enormous advantages respect to DNA, as these biomolecules can be preserved longer time scales and supply information on the past presence of specific microorganisms and the environmental conditions in which they were living. Some of these lipid biomarkers have been widely used in the last decades for paleoclimate interpretations². However, many uncertainties still remain due to the lack of information, in some cases, regarding the biological sources of these lipids, in which conditions they are synthesized and since when. To tackle these problems, I have based my research in the last years on investigating the microbial sources of specific lipids and how lipid biomarkers are synthesized. This is based on studies combining cutting-edge methods from lipidomics, genomics and culturing. Marine environments are excellent sources of novel microorganisms and their lipids, especially the largely unknown oxygen-deficient marine ecosystems. The extend of these oxygen-deficient areas, or “dead zones” is increasing, both in coastal areas due to pollution and in the open ocean due to warming and stratification. These marine areas harbor a vast variety of yet-unknown microorganisms, which can either contribute to or alleviate climate change³. Today, I invite you to a research trip from a sulfidic lake to the deep waters of the Black Sea, the largest anoxic basin in the world and model of past euxinic conditions, in a search of a lifetime searching for novel microbes living under pressure and their lipids shedding light on the evolution of lipid membrane acquisition.

Brief biography

I am currently a senior research scientist at the Royal Netherlands Institute for Sea research (NIOZ) and since 2020 also I am an associate professor at the Department of Earth Sciences, Faculty of Geosciences at Utrecht University. I did my PhD in the Department of Microbiology of the University of Barcelona on the molecular characterization of estuarine microbial mats by using lipid biomarkers and genetics. During my thesis, I performed several international internships in the Center for Biomarker Analysis of the University of Tennessee (Knoxville, TN, US) and in the UFZ-Center for Environmental Research (Leipzig, Germany). After defending my PhD in 2005, I did a postdoc in the Department of Microbiology at the University of Massachusetts (Amherst, US) on gene expression of sulfate reducing bacteria, and another postdoc at Harvard University, Center for Systems Biology, on

experimental evolution systems. In 2009, I started a tenure-track position in the Royal NIOZ as a geomicrobiologist, where I became tenured in 2013. I define myself as a marine (geo)microbiologist with interdisciplinary interests ranging from microbial ecology, evolution, membrane lipids and paleoclimatology. I have become an expert on the use of microbial lipids to determine the presence of specific microorganisms both in the present and in the past, with relevant applications in the understanding of the carbon, nitrogen and sulfur cycle in marine systems including anoxic and hypoxic areas. I am also a pioneer in the determination of lipid biosynthetic pathways of microbial lipid biomarkers, which has resulted in the growing use of genomic methods in the fields of organic geochemistry and paleoclimatology. In the last years, I have also extended my interests in the field of marine anaerobic microbiology and archaeal evolution.



CTD-Niskin being deployed in the Black Sea



Laminated sediments of the Black Sea

References

1. Sohlenkamp & Geiger (2016) FEMS Microbiology Reviews 40:133–159
2. Eglinton & Eglinton (2008) Earth and Planetary Science Letters 275:1–16
3. Wright et al., (2012) Nature Reviews Microbiology 10 :381–394

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1615546839320>

Divulgación en tiempos de pandemia: la COVID-19 explicada con fútbol

Dr. Julián Cerón

Institut d'Investigació Biomèdica de Bellvitge (IDIBELL)

Divendres, 19 de març de 2021

Resumen

La pandemia de la COVID-19 nos sorprendió a todos hace poco más de un año. Los que trabajamos en temas relacionados con ciencias de la biología podíamos interpretar, al menos parcialmente, el aluvión de noticias que nos llegaban. Sin embargo, una gran parte de la población se encontraba confundida y apabullada por no tener claros conceptos como virus, coronavirus, PCR o antígeno. Muchos de ellos preguntaban en su entorno a aquellos que sabían de Biología, como preguntamos al amigo o familiar mecánico cuando el coche hace un ruido extraño. En este contexto, el primer fin de semana tras el confinamiento decretado el 14 de marzo, escribí un artículo en mi web explicando lo que era un coronavirus y exponiendo las tres opciones que se oteaban en el horizonte para salir de esta pandemia: inmunidad de manada, vacunas, y fármacos. La peculiaridad fue que mi web se llamaba raticosdefutbol.com y que aproveché mi experiencia en escribir sobre fútbol para contar la ciencia de la COVID-19 salpimentada con analogías y anécdotas del mundo de fútbol. Ese primer artículo tuvo muy buena acogida y por ello decidí seguir escribiendo cada fin de semana del confinamiento sobre los temas que nos iban preocupando: mascarillas, test, contagios, niños, vacunas... En todos los artículos daba referencias científicas de publicaciones que había leído y filtrado. Tras las doce semanas de confinamiento, edité los doce artículos para hacer treinta capítulos de un libro que se llamó "Raticos de Coronavirus". El libro tiene un prólogo de vuestro ilustre compañero Carlos Pedrós-Alió que lo hace aún más peculiar, ya que puede ser uno de los pocos casos en la historia de la literatura donde el prólogo es mejor que el libro. Además del interés científico, creo que el libro tiene ahora el valor histórico de esas doce semanas y de la evolución de nuestras preocupaciones. En esta charla pretendo acompañaros en una revisión, como científicos y como ciudadanos, de aquellas doce semanas y de estos doce meses que nos han marcado para el resto de nuestras vidas.

Breve biografía

Julián Cerón Madrigal nació en Murcia en 1972. Estudió Bioquímica en la Universidad de Murcia y jugó en la selección de fútbol universitaria. Desde aquellos años, ciencia y fútbol han sido protagonistas principales en su vida. Como científico, ha desarrollado su carrera en diversas instituciones nacionales e internacionales. Tras el doctorado en el Instituto de Neurociencias de Alicante, investigó en el IGBMC de Estrasburgo y en la Universidad de Harvard de Boston (cinco años). De regreso a España, se asentó en Barcelona como investigador en el Hospital Vall d'Hebron. En la actualidad, dirige un grupo de investigación en modelos genéticos de enfermedad en el Instituto de Investigaciones Biomédicas de Bellvitge (IDIBELL) (www.ceronlab.com). Como futbolista, además de formar parte de la selección universitaria de Murcia, ha jugado en ligas amateurs

regionales, en Murcia, Escocia y Estados Unidos. Algunas de sus experiencias como jugador de fútbol y como aficionado las ha contado en el blog www.raticosdefutbol.com, y han sido publicadas en sus libros Raticos de fútbol I y Raticos de fútbol II. También ha participado en el libro solidario Balón Ubuntu, con el cuento “El gol de Chiukepo”.



*Portada del libro. El libro en papel está a la venta en Amazon, en castellano y en inglés, pero está **gratis** como libro electrónico en google books.*

References

- www.raticosdefutbol.com
- <https://raticosdefutbol.com/en-los-medios/>
- https://elpais.com/deportes/2020-08-30/mejor-con-futbol.html?ssm=TW_CC
- <https://www.marca.com/tiramillas/2020/12/22/5fe1eebe22601d04408b45b1.html>
- <https://www.laverdad.es/murcia/julian-ceron-conocer-20200817191926-nt.html>
- <https://www.20minutos.es/deportes/noticia/4419183/0/raticos-coronavirus-libro-covid-futbol-julian-ceron/>

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<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1616149163882>

Presentation of research projects initiated in 2020 - 3rd session

COLPLAI (Romera-Castillo), EPIPURE (Piferrer), ICE-MOD (Gabarró),
RAP (Isla)

Divendres, 26 de març de 2021

COLPLAI: Characterization of dissolved organic matter leached from plastics into seawater and its impact on marine microbes - Cristina Romera-Castillo

Starting date 01/10/2020. Duration in months 36. Call identifier PID2019-109889RJ-I00

Up to 12.7 million metric tons (MT) of plastic entered the ocean only in 2010, threatening marine fauna from small copepods to big mammals including human beings. Commercial plastic is never pure and it contains additives and plasticizers to improve the properties required for its purpose and to make it more resistant to degradation. When in contact with water, these additives can leach out to the aquatic medium. Plastic leaching is enhanced by solar radiation which can “photo-dissolve” plastic into dissolved organic carbon (DOC). Up to 23,600 metric tons of DOC is released per year from marine plastic. DOC makes part of different organic compounds constituting the dissolved organic matter (DOM) pool. The DOM leached from plastic is consumed by marine bacteria stimulating their growth. However, which type of bacteria are able to consume plastic leachates is still unknown. This project aims to understand the impact of plastic leachates on the carbon cycle and on marine microbes. It will study the chemical characteristics of the DOM leached from plastics into the seawater and the environmental conditions under which marine plastic leaching is higher. It will also analyze the impact of the organic compounds released by plastic into marine microbes and which are the bacterial groups and taxa consuming those leachates.

EPIPURE: Characterization of pure epialleles and their application as key performance indicators in finfish aquaculture - Francesc Piferrer

Starting date 01/06/2020. Duration in months 36. Call identifier: CNU/320/2019, BOE A-2019-4147

Epigenetic modifications are of great interest in the current Modern Synthesis. An epiallele is a specific methylation pattern of the DNA in a given genetic locus. Pure epialleles are those that, regardless of underlying genotype, respond equally to a given environmental change. Traits with a polygenic basis have complex genotype-by-environment responses. Thus, it is desirable to exploit the information provided by pure epialleles in animal production, ecology and evolution. The objective of EPIPURE is to characterize epigenetic marks associated with different stages of development. First, we will study how these marks are transmitted to offspring, thus addressing the debate about the degree of epigenetic reprogramming present in animals. Patterns of methylation during sexual development will also be studied. Finally, using DNA samples obtained from several families of sea bass, pure epialleles associated with different traits such as survival, growth and sex ratio will be identified. A set of modern research techniques including whole genome bisulfite sequencing (WGBS)

and single-cell RNA sequencing will be used. This project will generate both basic and practical information, with potential translational applications to fish farming and fisheries management.

ICE-MOD: Improving the sea ice low frequency microwave emission models - Carolina Gabarró

Starting date 01/09/2020. Duration in months 36. Call identifier PCI2019-111844-2

The information provided by remote sensing platforms on sea ice thickness and snow depth is crucial to understand the changes that the Arctic is facing under the threat of climate change, and in particular to study the evolution of sea ice mass and sea ice balance. There is the consensus that better models for sea ice and snow microwave emission are needed to achieve reliable estimates of thin sea ice thickness and snow depth from radiometry, since remote sensing platforms are the only way to grant continuous, wide area monitoring in the Arctic. MOSAIC offered a great and unique opportunity to fill this gap. Our experimental approach was the following: A light and small L-band radiometers (ARIEL) was mounted on a sled, permitting to measure under different ice conditions and targets. Many routinely in situ acquisitions were performed simultaneously. All these measurements will allow us to improve the emissivity for sea ice and snow.

RAP: Escape Room: Plastic Alert! - Enrique Isla

Starting date 01/01/2020. Duration in months 12. Call identifier FGCC-2020-0014

Predictions indicate that there will be more plastic than fish in the ocean by the year 2050. RAP aims to promote awareness of this situation in the group of scholars between 9 and 12 years old with an educative/outreach project, where kids will learn some facts of plastic pollution in the sea on a cross-disciplinary platform. The purpose is to inoculate students with the idea that is with science and collaborative work the way society will find solutions to social and environmental problems. The activity takes one hour but there are previous activities that may take few hours more to try to fit the escape room into a complete school project. The package consists in several files including introductory material for teachers, where they can find a description of the plastic problem in the sea and the instructions on how to develop the activity. Additionally, there is the file to execute the escape room with the series of questions corresponding to four scientific disciplines, which necessarily work together to find the clue to move onto the next step. Accompanying the material, there are badges to identify the students as technicians and scientists of three different disciplines to help the students “feel” what they are supposed to be during the escape room activity. In spite of COVID-19 restrictions, the execution of RAP has been successfully tested in one school. The material is for free and downloadable from pelagicbenthic.net, at the moment only available in Spanish.

Link to the talk

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The importance of small RNAs during development and reproduction

Dr. Elena Sarropoulou

Hellenic Centre for Marine Research, Greece

Divendres, 9 d'abril de 2021

Summary

Studying sex differences has significantly contributed to shed light on the mechanisms behind phenotypic variations from a similar genetic background. In particular, fish species have been considered of great importance in this regard since they exhibit a great variety in the biology of sexes. Similar investigations to unravel the molecular background of teleost development promises to better understand the timing of important developmental leaps. Besides the expression of genes, a significant portion of the genome undergoes transcription but is not translated into proteins. These transcripts have been classified as non-coding RNAs (ncRNAs) and have been thought of for a long time not to have any functional role. Today it has been widely accepted that ncRNAs have key cellular functions, and a broad range of studies have been published and are underway to unravel their ability to modulate gene expression. In contrast to DNA methylation and histone modifications, which belong to the well-known and classical epigenetic mechanisms, ncRNAs are the most recently discovered class of epigenetic effectors, regulating gene expression at the post-transcriptional level. Investigating sncRNA in both, reproduction and development showed differences among the major types of sncRNA and their functions. Within the present talk, ongoing sncRNA studies during reproduction and development in different teleost species will be discussed.

Brief biography

Dr. E. Sarropoulou is a Senior Researcher at the Institute of Marine Biology, Biotechnology and Aquaculture (IMBBC) of the Hellenic Centre for Marine Research (HCMR). She received her Diploma in Biology and Chemistry from the Ludwig-Maximilian University in Munich, Germany. After a year's work as a technician at the Institute of Marine Biology, Crete she moved to the Institute for Developmental Biology in Tuebingen, Germany where she received her Ph.D. Award in 2004. She carried out her Post-doc at her present Institute and in 2007 she was nominated as Researcher (Grade D). Among her main research interests are the roles of paralogous genes in teleost species. Following the first indications of different functional roles during development, she extended the research field to reproduction and issues related to disease response. As part of her research activities, she applies modern technologies of functional and comparative genomics. The challenge of differentially regulated genes in commercial aquaculture species in the Mediterranean has recently led her to further investigate the regulatory mechanisms at the epigenetic level.

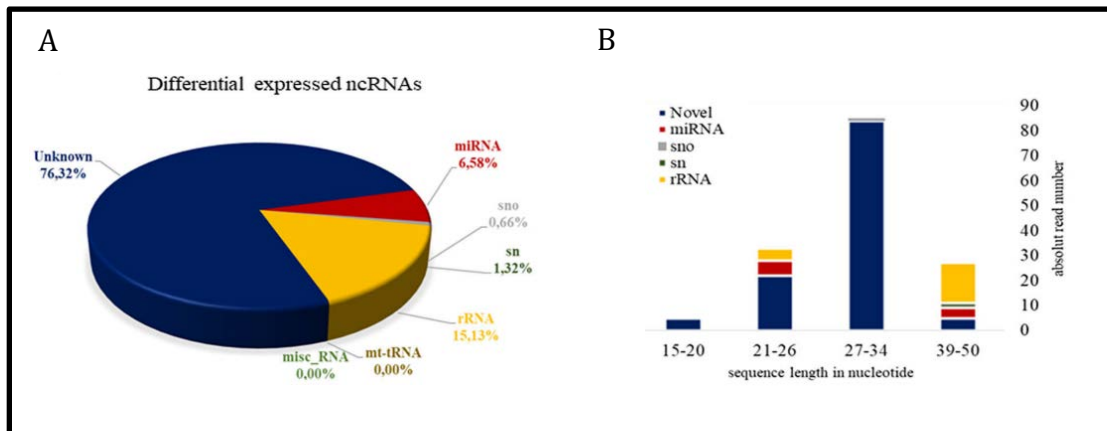


Figure. A. Pie chart of statistically significant differentially expressed ($p < 0.05$) small non-coding RNA percentages found in libraries of mature and immature sharpshout seabream ovaries. B. Read length distribution of different biotypes of small non-coding RNAs. miRNA microRNA, snoRNA small nucleolar RNA, snRNA small nuclear RNA, rRNA ribosomal RNA, mt-tRNA mitochondrial transfer RNA, miscRNA miscellaneous RNA.

References

- Papadaki, M., Kaitetzidou, E., Mylonas, C.C. et al. Non-coding RNA Expression Patterns of Two Different Teleost Gonad Maturation Stages (2020). *Mar Biotechnol* 22, 683–695. <https://doi.org/10.1007/s10126-020-09991-2>
- Sarropoulou, E, Kaitetzidou, E, Papandroulakis, N, Tsalafouta, A, Pavlidis, M. Inventory of European Sea Bass (*Dicentrarchus labrax*) sncRNAs Vital During Early Teleost Development (2019). *Front Genet* 10, 657. [10.3389/fgene.2019.00657](https://doi.org/10.3389/fgene.2019.00657)

Deep-sea *Marine Animal Forests* surrounded by fishing grounds in the Blanes Canyon

Dr. Pere Puig

Departament de Geociències Marines, Institut de Ciències del Mar

Divendres, 16 d'abril de 2021

Summary

During the ABIDES and ABRIC Projects, Remotely Operated Vehicle (ROV) dives were conducted along the Blanes Canyon (NW Mediterranean) with the aim of exploring the impact of bottom trawling activities on surface sediments and deep benthic communities. Cold Water Corals (CWCs) and other deep-sea marine benthic communities were discovered at numerous canyon locations, always associated with the presence of exposed rocky outcrops. These benthic communities create three-dimensional living structures, similar to those of vegetation forest in land, and have been recently grouped under the general term of "Marine Animal Forests" (MAFs). The occurrence of large communities of MAFs in this canyon had not been documented before (except for few dredged samples of CWCs), and represented an unexpected finding. The best developed communities were found at the canyon head region on steep (i.e., vertical and overhanging) canyon walls, at the western canyon flank, at depths ranging from ~900 to ~500 m depth. However, the detailed spatial distribution of the fishing pressure in Blanes Canyon indicates that these MAF communities are completely surrounded by active fishing grounds. The indirect impacts of bottom trawling on them by smothering (i.e., exposing them to elevated fluxes of poorly nutritive resuspended particles) might have unforeseen consequences. To evaluate those, several benthic species were collected during the ROV dives and have been kept in aquaria and recurrently exposed to turbid water inputs, replicating the effects of daily trawling activities. Since the deep-sea fishing activities conducted in the Blanes Canyon over the past decades are similar to the fisheries practiced along the entire Mediterranean margin, other deep-sea MAF communities already found (or yet to be discovered) in trawled submarine canyons might be facing the same impacts.

Brief biography

Scientific Researcher at the Institut de Ciències del Mar of Barcelona (CSIC). He received a degree in Geological Sciences at the Universitat Autònoma de Barcelona in 1992 and a PhD in Marine Sciences from the Universitat Politècnica de Catalunya in 1998. In 1999, he received a Fulbright grant to conduct a 2-year post-doctoral research at the School of Oceanography of the University of Washington. In 2001, he returned to the Institut de Ciències del Mar of Barcelona after obtaining a 5-years "Ramón y Cajal" tenure-track position, and in 2005 he became a Tenured Scientist. In 2009 he was promoted to Scientific Researcher. The general focus of his research is the study of the contemporary sedimentary dynamics in the marine environment to understand the mechanisms responsible for the off-shelf and cross- and along-margin sediment transport, with a special interest in the role that submarine canyons play as preferential conduits for the export of particles and associated constituents from shallow to deep regions. His studies have had a significant inter-

disciplinary component, with the aim of assessing the consequences of specific sedimentary processes in the marine ecosystem. Lately, the focus of his research has been addressed to understand the role of deep-sea bottom trawling activities in the sediment resuspension and dispersal in continental slope environments. He has published 148 scientific articles and 14 book chapters and participated in more than 300 communications to meetings, 30 of them as an invited speaker.

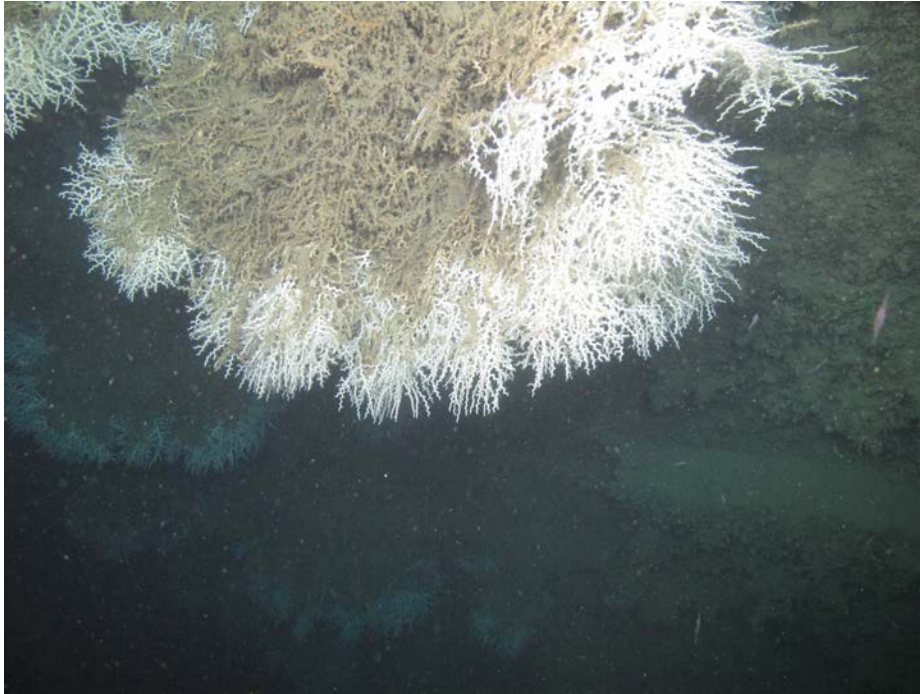


Image of deep corals sitting in the Blanes Canyon

References

- Puig, P.; Gili, J.M. (2019) Submarine canyons in the Mediterranean: a shelter for cold-water corals. In: Orejas, C., Jiménez, C. (Eds.) Mediterranean Cold-Water Corals: Past, Present and Future. Springer. ISBN 978-3-319-91607-1. pp 285-289.
- Puig, P.; Lo Iacono, C.; Durán, R.; Grinyó, J.; Ambroso, S.; De Leo, F.; Arjona-Camas, M.; Paradis, S.; Palanques, A.; ABIDES cruise team (2019). Living Cold Water Corals surrounded by fishing grounds in Blanes Canyon (NW Mediterranean). GeoHab 2019 Annual Conference. St. Petersburg, Russia

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1618565548500>

El cranc blau a la Mediterrània: problemàtica i estat actual al Delta de l'Ebre

Dr. Pere Abelló i Verònica López

Institut de Ciències del Mar i Monverte Estudis Ambientals

Divendres, 23 d'abril de 2021

Resum

El cranc blau americà, *Callinectes sapidus*, ha començat a ser mediàtic els darrers pocs anys. Es tracta d'una espècie alòctona (no autòctona) a les nostres costes. Es desconeix el mecanisme concret pel que va arribar a la Mediterrània occidental, però el més probable és que hi arribés per dispersió larvària a partir de les poblacions assentades a la Mediterrània oriental i central des de fa dècades. Després d'un primer assentament fallit al Mar Menor l'any 2003, l'espècie no es va tornar a trobar fins el 2017 al Delta de l'Ebre, zona on s'hi ha establert completament des d'aquell moment, on va provocar un daltabaix total en la pesqueria artesanal de la zona degut a la seva colonització exponencial dels ecosistemes deltaics. Posteriorment ha anat colonitzant altres zones tant cap al SW com al NE, fins a les llacunes franceses del Golf de Lleó. En aquesta xerrada us presentarem en primer lloc el cranc blau i les seves característiques biològiques, fisiològiques i comportamentals bàsiques, per entrar en una segona part en la presentació dels principals resultats que s'estan obtenint en l'actualitat sobre l'expansió i gestió poblacional del cranc per part del Comitè de Cogestió del Cranc Blau de les Terres de l'Ebre auspiciat per la col·laboració entre la Direcció General de Pesca i Afers Marítims de la Generalitat de Catalunya i l'Institut de Ciències del Mar – CSIC, mitjançant l'Institut Català de Recerca per la Governança del Mar (ICATMAR).

Breu biografia

En **Pere Abelló** és Doctor en Ciències Biològiques per la Universitat de Barcelona (1986). Treballa a l'Institut de Ciències del Mar. La seva especialitat són els crustacis decàpodes i fonamentalment els crancs. Els seus estudis s'han centrat en la faunística i biologia de poblacions, principalment en relació a l'activitat pesquera, però també en aspectes de comportament i paper ecològic en ecosistemes costaners, aspectes que va iniciar durant la seva estada postdoctoral a la University of Wales. Ha treballat fonamentalment a la Mediterrània, però també a l'Atlàntic europeu, africà i centreamericà. L'arribada d'espècies no autòctones a les nostres aigües i costes representa un repte d'adquisició de coneixements i de gestió en el que en l'actualitat s'hi implica mitjançant el Comitè de Cogestió del Cranc Blau de les Terres de l'Ebre. Na **Verònica López** és llicenciada en Biologia per la Universitat de Girona (2005). Va treballar com a tècnica especialitzada en la gestió dels espais naturals i la conservació de la fauna aquàtica al Parc Natural del Delta de l'Ebre (2005-2016) on va publicar el llibre "Atlas de peixos del Delta de l'Ebre". Actualment és Gerent de Monverte Estudis Ambientals (2010) i consultora ambiental especialitzada en el monitoreig de la fauna i el control d'espècies invasores. Forma part del Comitè de Cogestió del Cranc Blau i des del 2016 és professora de cultiu de peixos i crustacis a l'Institut d'Estudis Professionals Aquícoles i Ambientals de Catalunya, a Sant Carles de La Ràpita.



Imatge d'un cranc blau (Fotografia de Pablo Ruiz)

References

<https://www.ccma.cat/tv3/alicarta/30-minuts/cranc-blau-la-plaga-a-taula/video/6073886/>

Comité de Cogestió del Cranc Blau de les Terres de l'Ebre:

http://agricultura.gencat.cat/ca/ambits/pesca/dar_especies_calador_mediterrani/dar_crustacis/cranc-blau/

Lopez & Rodon. 2018. Diagnosi i situació actual del Cranc Blau (*Callinectes sapidus*) al Delta de l'Ebre:

http://agricultura.gencat.cat/web/.content/08-pesca/especies-modalitats-pesqueres/enllacos-documents/fitxers-binari/Informe_Cranc_Callinectes_sapidus.pdf

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The Anthropocene ocean - Risks and opportunities for global sustainability

Dr. Jean-Baptiste Jouffray

Stockholm Resilience Centre, Stockholm University, Sweden

Divendres, 30 d'abril de 2021

Summary

Humans have become a dominant force of planetary change. This epoch, referred to as the Anthropocene, implies profound alterations to the Earth's marine and terrestrial ecosystems upon which so many people depend. The prospect of a new era of blue growth, in particular, poses unprecedented sustainability and governance challenges to the ocean, as marine ecosystems face cumulative pressures from local human impacts, global climate change and distal socioeconomic drivers. This talk will explore what the Anthropocene means for the ocean and how to steer it in a sustainable and equitable way. With the UN Decade of Ocean Science for Sustainable Development poised to begin, I will present on-going research at the science-policy-practice interface that could inform how to approach ocean sustainability in the 21st century.

Brief biography

Jean-Baptiste's research focuses on the interlinked social, economic and ecological challenges that shape the new global ocean context. His work involves inter- and trans-disciplinary approaches, ranging from indicators for effective coral reef management to the global seafood industry, the role of transnational corporations, and how the financial sector can contribute to ocean sustainability. Jean-Baptiste has a background in natural science with a BSc in Biology of Organisms, Populations and Ecosystems from University Paul-Sabatier (France), and an MSc in Ecology from Stockholm University (Sweden). He recently graduated as a joint PhD in Sustainability Science of the Global Economic Dynamics and Biosphere programme at the Royal Swedish Academy of Sciences and Stockholm Resilience Centre, Stockholm University.

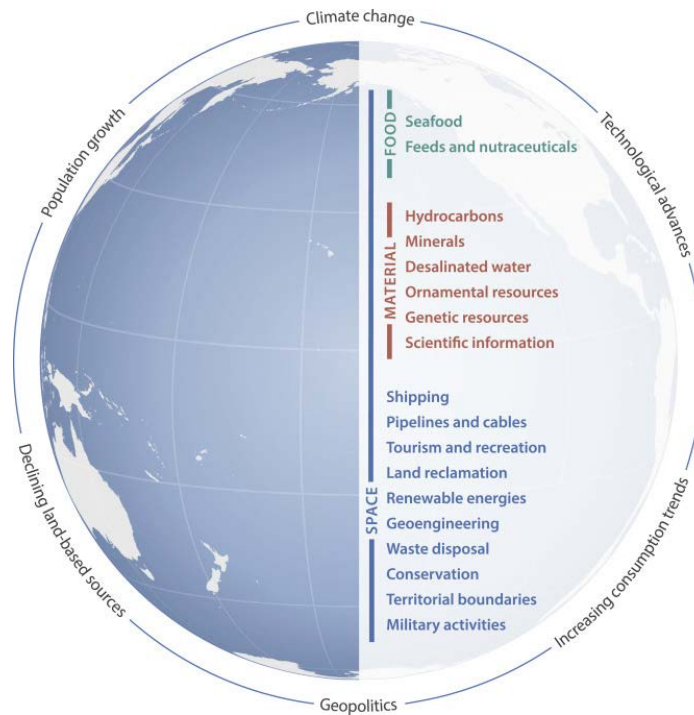


Figure. Ocean Claims: The ocean is increasingly regarded as an engine of present and future human needs for food, material, and space. Claims were identified and categorized through an iterative process aimed at understanding ocean uses of direct relevance for ecosystem sustainability, human well-being, and economic growth. Around the globe are some of the key distal drivers shaping this new global ocean context.

References

- Jouffray, J.B., Blasiak, R., Norström, A.V., Österblom, H. and Nyström, M., 2020. The blue acceleration: the trajectory of human expansion into the ocean. *One Earth*, 2(1), pp.43-54.
- Viridin, J., Vegh, T., Jouffray, J.B., Blasiak, R., Mason, S., Österblom, H., Vermeer, D., Wachtmeister, H. and Werner, N., 2021. The Ocean 100: Transnational corporations in the ocean economy. *Science advances*, 7(3), p.eabc8041.
- Österblom, H., Jouffray, J.B., Folke, C. and Rockström, J., 2017. Emergence of a global science–business initiative for ocean stewardship. *Proceedings of the National Academy of Sciences*, 114(34), pp.9038-9043.
- Jouffray, J.B., Crona, B., Wassénus, E., Bebbington, J. and Scholtens, B., 2019. Leverage points in the financial sector for seafood sustainability. *Science advances*, 5(10), p.eaax3324.

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1619776069973>

COSMO, MEDOSMOSIS, SHAREMED, BlueNetCat,... full de ruta cap a una IDE marina

Dr. Emili García-Ladona

Departament d'Oceanografia Física i Tecnològica, Institut de Ciències del Mar

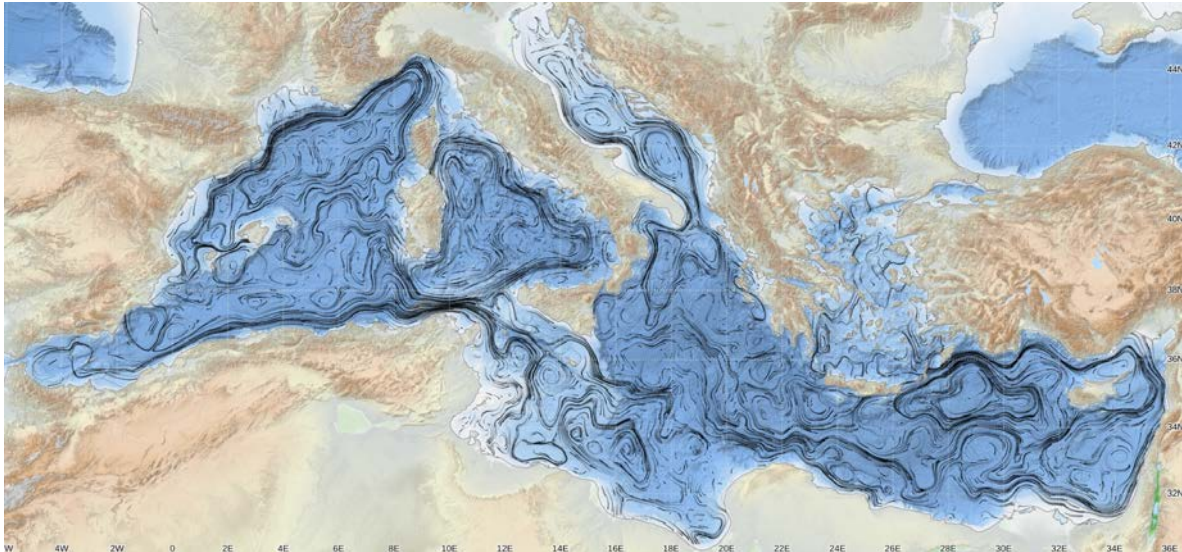
Divendres, 7 de maig de 2021

Resum

Una IDE és una Infraestructura de dades espacials que permet emmagatzemar, guardar i distribuir dades per a diferents funcionalitats (recerca, disseminació, divulgació, etc). COSMO (Corrents marines i seguretat a medi marí, CTM2015-68298-R), MEDOSMOSIS (Mediterranean governance for Strategic Maritime Surveillance and Safety issues, 6119), i SHAREMED (Sharing and enhancing capabilities to address environmental threats in Mediterranean sea, 6MED19_4.1_SP_006), són els projectes que actualment concorren amb una forta càrrega per a compartir i uniformitzar l'accés a la informació amb finalitats de millorar la governança del medi marí. BlueNetCat (2018_XARDI_00005) és la Xarxa d'R+D+I Marítima de Catalunya finançada per la Generalitat on un dels seus eixos és la capitalització de les dades marines dels grups de recerca marina (64) a Catalunya. En aquesta xerrada s'exposaran diversos exemples d'activitats que s'estan duent a terme en aquestes i altres iniciatives relacionades amb l'organització i capitalització de les dades de l'ICM.

Brief biography

Emili García és doctor en física per la Universitat Autònoma de Barcelona (UAB). Ha estat professor del Departament de Física d'aquesta universitat durant 10 anys i investigador des de 1995 al Departament d'Oceanografia Física i Tecnològica de l'Institut de Ciències del Mar (CSIC). Les àrees de recerca d'interès són els processos de mesoescala, en tèmics com ara la circulació i dinàmica de la conca Mediterrània, processos de dispersió i dinàmica lagrangiana, estructures coherents, modelització d'ecosistemes, etc.. Altres activitats han estat relacionades amb desenvolupaments científico-tècnics relacionats amb aspectes tan diversos com el reconeixement de patrons d'imatges d'otòlits o eines en el marc de l'oceanografia operacional. El projecte COSMO i MEDOMOSIS en són exemples d'aquestes activitats. Més a <http://oce.icm.csic.es/emilio>.



Atlas de corrents climatològiques pel mes d'Abril desenvolupat en el projecte COSMO

(<https://cosmo.icm.csic.es/currents>)

References

- Isern-Fontanet J., E. García-Ladona , J.A. Madrid, E. Olmedo, M. García-Sotillo, J. Orfila, A. Turiel, 2020: Real-time reconstruction of surface velocities from satellite observations in the Alboran Sea. *Remote Sensing*, 12(4), 724.
- Sotillo M.G., García-Ladona E., Orfila A., Rodríguez-Rubio P., Rietz A., Conti D., Padorno E., Jiménez J.A., Capó E., Pérez F., Sayol J.M., de los Santos F.J., Amo A., Maraver J.C., Troupin C., Tintoré J. and E. Álvarez-Fanjul. 2016: The MEDESS-GIB database: Tracking the Atlantic water inflow *Earth System Science Data*, 8, 141–149.
- García-Ladona E. , Salvador J., Fernández P., Pelegrí J.L., Elósegui P., Sánchez O., Jiménez-Madrid J.A., Pérez F., Ballabrera J., Isern-Fontanet J., Font J. and J. Salat, 2016: 30 years of research and development of Lagrangian buoys at the Institute of Marine Sciences. *Scientia Marina*, 80S1, 141-158.
- Jiménez Madrid J.A., E. García-Ladona and B. Blanco Neruelo, 2016: Oil Spill beaching probability for the Mediterranean Sea. In: *Oil Pollution in the Mediterranean Sea. The Handbook of Environmental Chemistry Series*. Ed: A. Carpenter, A. Kostianoy, Springer Verlag. pp: 1-20, DOI: 10.1007/698_2016_37. ISSN: 1867-979X

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1620382635617>

Diversity and evolution of marine invertebrates: Anthozoa (Cnidaria) as a case study

Dr. Estefania Rodriguez

American Museum of Natural History, New York, US

Divendres, 14 de maig de 2021

Summary

Sea anemones (Cnidaria, Anthozoa, Actiniaria) are among the most diverse and successful members of the anthozoan subclass Hexacorallia, being found in all marine benthic habitats at all depths and latitudes. Despite their morphological simplicity as tissue level organisms, sea anemones are an ancient lineage whose members have remarkably diverse life history strategies, including all reproductive strategies. Their ecological success is undoubtedly facilitated by their propensity for engaging in symbiotic relationships with other animals and microorganisms, including hermit crabs, mollusks, clown fish and photosynthetic algae. From the perspective of phylogenetic systematics and evolutionary biology, their long evolutionary history and remarkable diversity poses problems of broader theoretical or methodological consequence. My research addresses the diversity and evolution of marine invertebrates, focusing on sea anemones. I am interested in questions such as convergence of morphological characters, phylogenetic value of traditionally used taxonomic characters, and relationship between high levels of intraspecific morphological variability and reproductive strategies. Several of my ongoing research projects represent groundbreaking attempts to develop new tools for sea anemone systematics and phylogenetics (e.g. developing different level molecular markers for the group, application of new imaging techniques, etc.). The need for these studies is clear—without this solid phylogenetic baseline and tools we cannot fully understand sea anemone diversity, evolution, and the processes shaping those. In other projects I address the foundation of any evolutionary study, establishing a baseline of knowledge of the biodiversity of the group, describing and documenting taxa and their characters (e.g. producing species descriptions and regional inventories). In addition, part of my research addresses the critical lack of taxonomic expertise and resources for the group, not only mentoring and forming students and postdoctoral fellows but actively developing resources to make taxonomic expertise more accessible and promoting the inclusion of sea anemones in broader marine invertebrate evolutionary studies.

Brief biography

I am an evolutionary biologist with a fundamental interest in understanding morphological diversity, systematics, evolutionary history, and ecology of anthozoans, with a particular focus on sea anemones (Cnidaria: Anthozoa: Actiniaria). I am originally from Spain where I got my bachelor's degree in Biology in 1999 at the University of Sevilla. During the following years I continued my studies and did a PhD in collaboration between the University of Sevilla and the Instituto de Ciencias del Mar (CMIMA-CSIC) in Barcelona. My PhD research was focused on the taxonomy, biogeography and

reproduction of Antarctic sea anemones, allowing me to participate in research cruises, visit different international research institutions and museums. After defending my PhD in 2007, I was a postdoctoral fellow for almost three years at the Ohio State University (Columbus, Ohio, USA) where I learnt molecular techniques and a more evolutionary focus to my research on sea anemones. Since 2009, I hold a tenure-track position as the Curator of the Marine Invertebrates collections at the American Museum of Natural History (AMNH, NY, USA). In addition to my supervision and care of the collections at the AMNH, I continued my research on the biodiversity and evolution of sea anemones. My research program is solidly established and rooted in traditional museum science based on collecting, preparing and using specimens to test hypothesis of sea anemone evolution; this program is externally funded and highly collaborative, with tangible published results in respected per-reviewed journals.



South African sea anemone (B. Picton)



Intertidal collecting in South Africa

References

- Quattrini AM, Rodríguez E, BC Faircloth, P Cowman, MR Brugler, G Farfan, ME Hellberg, MV Kitahara, CL Morrison, DA Paz-Garcia, JD Reimer, CS McFadden (2020) Paleoclimate ocean conditions shaped the evolution of corals and their skeletons through deep time. *Nature Ecology and Evolution*. 4: 1531–1538.
- Gusmão LC, Grajales A, Rodríguez E (2018) Sea Anemones through X-rays: Visualization of two species of *Diadumene* (Cnidaria, Actiniaria) using Micro-CT. *American Museum Novitates*, 3907: 1-47.
- Rodríguez E, Barbeitos M, Brugler MR, Crowley L, Gusmão LC, Häussermann V, Grajales A, Reft A, Daly M (2014) Hidden among sea anemones: The first comprehensive phylogenetic reconstruction of the order Actiniaria (Cnidaria, Anthozoa, Hexacorallia) reveals a novel group of hexacorals. *PLoS ONE* 9: e96998.

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1620984927641>

Winners, losers and shifts of the pelagic ecosystem in the western Mediterranean Sea: integrating knowledge and projecting trajectories of change

Dr. Marta Coll

Departament de Recursos Marins Renovables, Institut de Ciències del Mar

Divendres, 21 de maig de 2021

Summary

Nowadays, the single-stock assessment approach is most used for the management of marine resources. However, the dynamics of exploited stocks are influenced by other factors than fishing alone. Environmental and ecosystem dynamics, and economic and social aspects are also highly relevant, and can interact with fishing impacts. These factors are often overlooked when making management decisions. In particular, small pelagic fish species (SPF) such as European sardine (*Sardina pilchardus*) and European anchovy (*Engraulis encrasicolus*) are some of the most commercially exploited species in the NW Mediterranean Sea. They have shown important changes in the last decades in terms of shifts in abundance, biomass, body condition, growth, reproduction and spatial distribution. Different hypotheses have been formed to explain these changes, such as an increase in fishing impacts; changes in environmental conditions that have affected annual recruitment, growth, general conditions of organisms, and planktonic productivity and quality; a recent recovery of pelagic predators; and competition for food with jellyfish or round sardinella (*Sardinella aurita*). Under three consecutive projects, SPELMED, PELWEB and PELCAT, we aimed at improving and integrating SPF knowledge into a multi-modelling platform to quantify the impacts and project future trajectories of change. We specifically aimed at (1) identifying historical changes of small pelagic fish population traits (e.g. body condition, abundance and distribution); (2) quantifying the ecological and socio-economic consequences of the changes in SPF populations on fisheries, iconic predator species, and ecosystem-wide dynamics, and (3) identifying robust future management options to achieve resilient and healthy SPF populations and a sustainable exploitation under climate change. During this talk, I will present some of our findings and I will illustrate the importance of an integrated consideration of climatological, environmental, ecological and socio-economic factors when managing exploited resources from an ecosystem-based management perspective. I will showcase the tools that we used to generate and integrate results, ranging from stock assessments to species distribution models and process-oriented ecosystem spatial-temporal models.

Brief biography

I am a researcher at the Institute of Marine Science (ICM-CSIC) (Barcelona, Spain). My research focuses on understanding patterns and processes that have and will characterize marine ecosystems and, in particular, changes of, and threats to, marine biodiversity. I study community and food-web dynamics linked with human activities (such as fisheries, eutrophication, invasive species

and climate change), and how these translate into changes in ecosystem structure and functioning, and into services that humans obtain from the ocean. I develop and apply a variety of ecological analyses based on ecosystem modelling techniques and statistical tools, and I use historical data, experimental results and field data sets. I currently work on developing and testing scenarios of future trajectories of change to find best solutions for transformative management of the oceans.

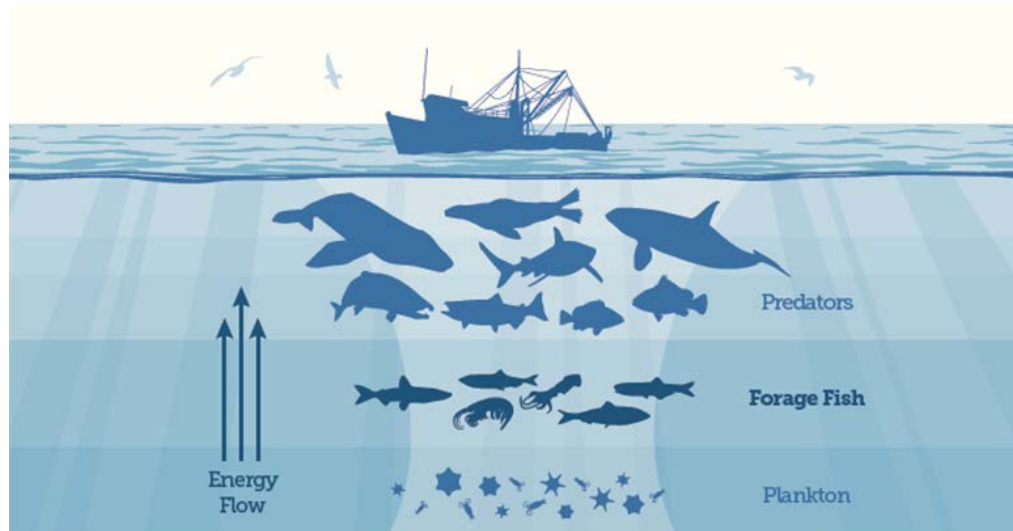


Figure Forage Fish @ The Pew Charitable Trusts

References

- Bachiller, E., Albo-Puigserver, M., Gimenez Verdugo, J., Grazia Pennino, M., Mari-Mena, et al., 2020. A trophic latitudinal gradient revealed in anchovy and sardine from the Western Mediterranean Sea using a multi-proxy approach. *Scientific Reports* 10, 18.
- Coll, M., Albo-Puigserver, M., Navarro, J., Palomera, I., Dambacher, J., 2019. Who is to blame? Plausible pressures on small pelagic fish population changes in the NW Mediterranean Sea. *Marine Ecology Progress Series* 617-618, 277-294.
- Pennino, G.M., Bachiller, E., Lloret Lloret, E., Albo Puigserver, M., Jadaud, A., Bellido, J.M., Coll, M., 2020. Ingestion of microplastics and occurrence of parasite association in Mediterranean anchovy and sardine. *Marine Pollution Bulletin* 158, 111399.
- Ramírez, F., Pennino, G.M., Albo Puigserver, M., Steenbeek, J., Bellido, J.M., Coll, M., 2021. SOS small pelagics: a Safe Operating Space for small pelagic fish in the Western Mediterranean Sea. *Science of the Total Environment* 756.

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<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=b7f5f0e5923f17183478d55ab468f41c51f47926-1621590225426>

Surfing for Science: una iniciativa de ciència ciutadana per afinar el balanç de plàstic als oceans

Dr. Anna Sanchez Vidal

Facultat de Ciències de la Terra, Universitat de Barcelona

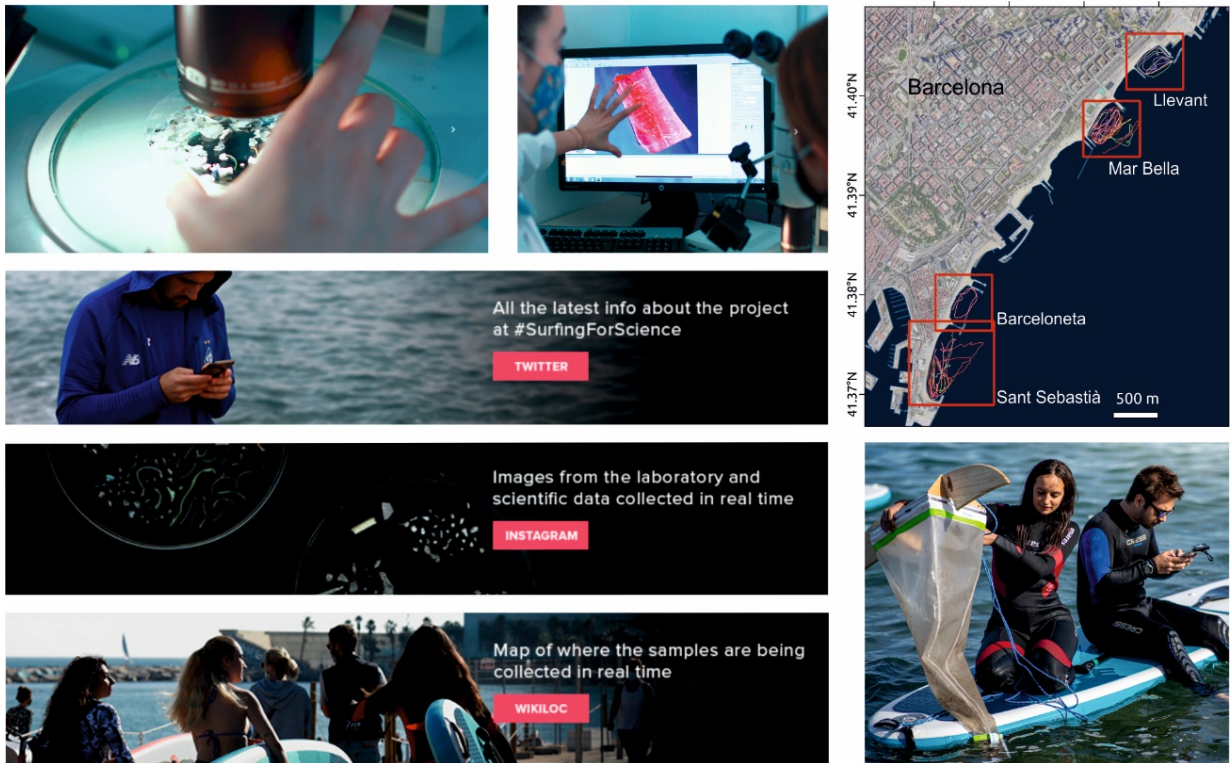
Divendres, 11 de juny de 2021

Resum

La presència ubiqua de microplàstics - fragments de plàstic de mida inferior a 5 mm - als oceans és un problema mundial de preocupació social creixent. Si bé molts estudis han obtingut dades sobre la distribució de microplàstics en platges o a mar obert, hi ha molt poca informació sobre microplàstics flotant a pocs metres de la costa, una zona de transició crítica on es produeix el major intercanvi de deixalles entre el continent i el mar, i on els grans vaixells oceanogràfics tenen dificultats d'accés per a prendre mostres científiques. El projecte "Surfing for Science" iniciat l'any 2020 ha suposat un canvi de paradigma en les investigacions de microplàstics, permetent resoldre aquesta llacuna de coneixement, amb una resolució espacial i temporal d'adquisició de dades fora de l'abast de cap institució científica, i sent la pròpia societat un dels actors indispensables per a aquest canvi. Des d'octubre de 2020 diferents col·lectius de ciutadans (esportius, socials, educatius, ambientals) obtenen mostres científiques de microplàstics surant al litoral català, en 12 localitats des de Llançà fins a l'Ametlla de Mar, mitjançant arrossegament d'una xarxa amb una taula de pàdel surf, caiac o embarcació de rem oceànic. Les mostres s'envien a la Facultat de Ciències de la Terra de la Universitat de Barcelona per a la seva anàlisi i interpretació: l'abundància, la mida, el color i el tipus de polímer permeten investigar mecanismes de dispersió i fragmentació, temps d'exposició, i potencials fonts d'aquesta contaminació. Els resultats són incorporats de manera contínua a les xarxes socials (Instagram, Wikiloc, Twitter) per fomentar la seva difusió i transferència, i convertir els col·lectius en els veritables promotors de la investigació, alhora que permeten empoderar la ciutadania i fomentar la sensibilització sobre la contaminació per plàstic.

Breu biografia

Llicenciada en Ciències Ambientals (UdG, 1999), doctora en Ciències del Mar (UB, 2005) i professora agregada a la Facultat de Ciències de la Terra de la UB des de 2017, on imparteixo docència als graus de Ciències del Mar i Geologia, i al Màster d'Oceanografia i Gestió del Medi Marí. La meua activitat investigadora ha estat centrada en determinar els processos que controlen el transport de partícules i el funcionament dels ecosistemes marins profunds, a partir de la caracterització geoquímica de la neu marina i els sediments superficials i l'estudi dels forçaments meteorològics i oceanogràfics. En els darrers anys, m'he centrat també en els forçaments antropogènics, en forma d'abocaments de residus miners, contaminants orgànics persistents, deixalles i microplàstics.



References

<http://www.surfingforscience.org/>

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1623406799626>

El compromís de l'ICM per la igualtat de gènere: presentació del primer Pla d'Igualtat

Sílvia Donoso, María Gracia Puga, Esther Garcés

Institut de Ciències del Mar

Divendres, 18 de juny de 2021

Resum

Malgrat l'impuls envers la igualtat a les institucions de recerca dels darrers anys i els avenços assolits, encara hi ha un llarg camí per recórrer. El compromís de l'Institut de Ciències del Mar amb la igualtat, liderat des del 2017 des del Grup de Treball d'Igualtat, va rebre un impuls clau amb l'obtenció de finançament de dos projectes europeus Horizon 2020, LeTSGEPs i ResBIOS. L'ICM s'alinea així amb l'objectiu de la Comissió Europea de garantir la igualtat de gènere en la recerca. Com a resultat, comptem per primer cop amb un Pla d'Igualtat de Gènere a nivell de centre realitzat en el marc del projecte LeTSGEPs. El procés de disseny del Pla va iniciar amb una diagnosi que ha permès establir la realitat concreta de dones i homes en relació a la igualtat de tracte i oportunitats, així com identificar bretxes d'iniqüitat i els factors que les produeixen. En resposta als resultats de la diagnosi, les directrius de la Comissió Europea i sota el paraigua del Pla d'Igualtat del CSIC, el Pla de l'ICM estableix objectius i resultats, i defineix un conjunt de mesures per assolir-los que s'articulen al voltant de diversos eixos d'intervenció, entre d'altres: el desenvolupament de la carrera professional; la formació en la igualtat de gènere; l'ordenació del temps de treball, la corresponsabilitat i la conciliació de la vida personal, familiar i laboral; la igualtat en les estructures funcionals i organitzatives del centre; o la inclusió del gènere en la investigació i la innovació. El Pla, que s'implementarà al llarg dels pròxims 2 anys, integra accions transversals que han d'ancorar-se en les polítiques institucionals i mesures d'acció positiva adreçades a corregir situacions patents de desigualtat. Es tracta a més d'un document viu que pot ser adaptat per respondre idòniament a nous reptes i contextos futurs.

Breu biografia

Sílvia Donoso López holds a PhD in Social Anthropology and a Master in Gender and Equality Policies between Women and Men. I have a long experience formulating and monitoring equality active policies and plans aimed to eradicate discrimination on the basis of gender and to promote equal opportunities between women and men in labour market for some public administrations, enterprises, social organizations and different international organisms. As a Gender Equality Officer for LeTSGEPs, I am fully involved in the formulation of the ICM Gender Equality Plan.

María Gracia Puga Villanueva holds a Master in Gender Studies and a bachelor's degree in Law. My professional goal is to contribute to social initiatives aimed to promote gender equality, citizenship, participation, and social welfare. I have experience developing gender equality workshops and materials and have participated in an international project promoting gender equality in higher education institutions. As a gender expert for LeTSGEPs, I am fully committed to supporting the

implementation of the ICM Gender Equality Plan and the actions related to this instrument.

Esther Garcés, PhD in Biology. I am currently a senior researcher at ICM, leading a research group on Biological Coastal Processes since 2013. As a marine biologist, my current interests are plankton dynamics in marine systems. Parallel to the scientific activity, I am highly involved in Gender Equality in ICM, leading the EU SWAFS project LeTSGEPs for my institution and participating in RESBIOS, focused on Responsible Research and Innovation in Marine Science.

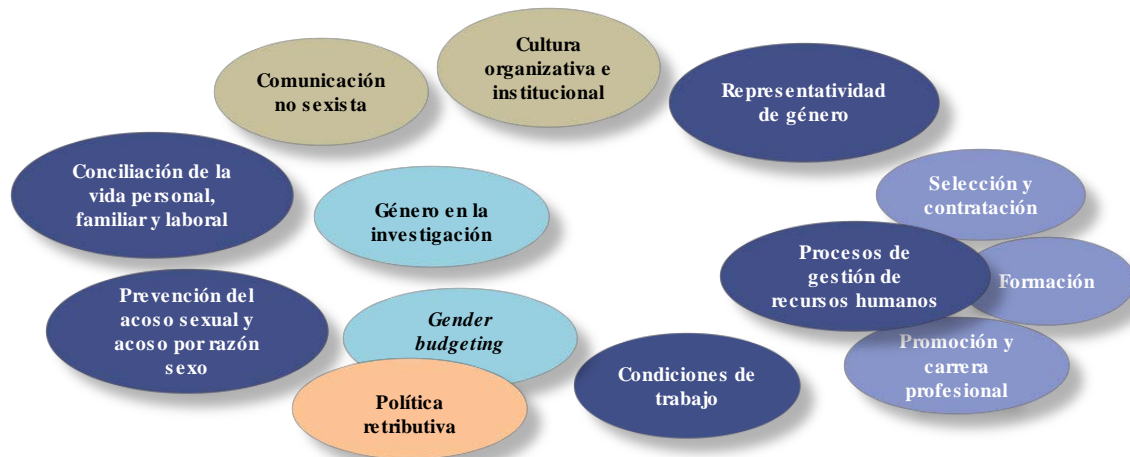


Figura. Àmbits d'intervenció del Pla d'Igualtat de l'ICM

References

European Institute for Gender Equality (EIGE), 2021, Gender Equality in Academia and Research - GEAR tool. <https://eige.europa.eu/gender-mainstreaming/toolkits/gear>

II Plan de Igualdad entre Mujeres y Hombres en la Agencia Estatal Consejo Superior de Investigaciones Científicas. <https://www.csic.es/es/el-csic/ciencia-en-igualdad/igualdad-en-el-csic>

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1624009689887>

Macroalgal blooms: a global dimension problem

Dr. Ligia Collado-Vides

Department of Biological Sciences, Florida International University, US

Divendres, 9 de juliol de 2021

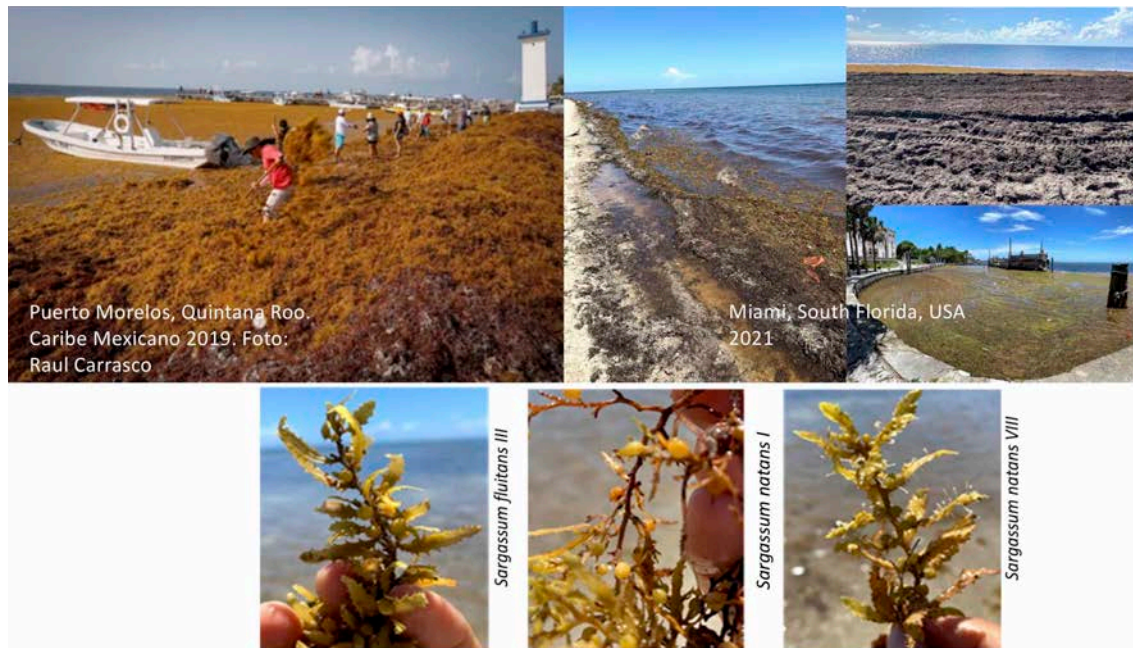
Summary

Algal blooms are part of our oceans and coastal ecosystems' dynamics, however in recent years reports of increase in frequency and magnitude of these blooms have caused alarm. Macroalgal blooms are also increasing and becoming harmful to ecosystems and humans. Finding causes, consequences and ability to forecast and manage these blooms are challenging scientists, managers and policy makers. Macroalgal blooms are from species of green, red and brown divisions; some are from introduced species, others are native, or from large displacements of pelagic species. Increases in nutrient availability from continental fertilizers, industrial and residential wastes, discharged at local scale and accumulated in the oceans; as well as climate change are suggested as major causes that facilitate these massive growths. While we have strong correlations, in some cases we need experimental proofs linking nutrients to some macroalgal blooms. Our studies from South Florida and the Caribbean demonstrate that losses of seagrass beds are the immediate impact of massive influxes of macroalgae on shores and beaches; and increase in frequency and magnitude of these events results in ecosystem shifts to benthic macroalgae dominated systems. In addition, lack of basic biological knowledge of blooming species needs to be addressed. The problem is dire, and needs coordinated efforts of scientists, managers and policy makers. However, macroalgal blooms are fixing carbon and incorporating nutrients, a wise use of those blooms can become an opportunity for stakeholders and for cleaning the oceans.

Brief biography

Dr. Ligia Collado-Vides is a marine botanist working at Florida International University; her research is on tropical marine macroalgae on seagrass and reef ecosystems in South Florida and the Caribbean. Among other projects, her group is conducting a monitoring program estimating the influx and measuring metals and nutrient on of the pelagic *Sargassum* in Florida. Her group has developed a Citizen Science program for *Sargassum* landings in South Florida and the Caribbean. She is the founder and coordinator of the international discussion list-serve for Sargassum SagNet that brings together experts, managers, policy makers and public at large, she is a supporter of Sargassum Podcast. Dr. Collado-Vides is actively involved in the *Sargassum* development at local and regional levels. Dr. Collado-Vides got her PhD from the Universidad Nacional Autónoma de México, where she became Associated Professor; in Florida, her position is Associate Chair of the Department of Biological Sciences at FIU. She is a member of the Association of Marine Laboratories of the Caribbean, the Latin-American and Caribbean Association of Phycology, and member of the American and the International Phycological Societies. She has more than 58 scientific publication, large amount of scientific meetings participation, she devotes strong efforts to improve scientific and

environmental literacy through national and international education.



References

Rodríguez-Martínez RE, Priyadarsi DR, Torrescano-Valle N, Cabanillas-Terán N, Carrillo-Domínguez S, Collado-Vides L, García-Sánchez M, van Tussenbroek BI. 2020. Element concentrations in pelagic *Sargassum* along the Mexican Caribbean coast in 2018-2019. *PeerJ* 8:e8667

van Tussenbroek BI, Hernández Arana HA, Rodríguez-Martínez RE, Espinoza-Avalos J, Canizales-Flores HM, González-Godoy CE, Barba-Santos MG, Vega-Zepeda A, Collado-Vides L. 2017. Severe impacts of brown tides caused by *Sargassum* spp. on near-shore Caribbean seagrass communities. *Marine Pollution Bulletin* 122: 272-281.

Santos R, Varona G, Avila C, Lirman D, Collado-Vides L. 2019. Competition between seagrass and macroalgae determines the spatial structure of submerged aquatic vegetation seascapes: The case of the *Anadyomene* spp bloom in Biscayne Bay, Florida. *Marine Pollution Bulletin* 150:110742.

Lapointe et al 2021 Nutrient content and stoichiometry of pelagic *Sargassum* reflects increasing nitrogen availability in the Atlantic Basin. *Nature Comm* 12:3060

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1625821342152>

Fine scale oceanic and atmospheric processes: impacts on ocean dynamics and biogeochemical variability

Dr. Lionel Renault

University of Toulouse, France & University of California, Los Angeles, USA

Divendres, 8 d'octubre de 2021

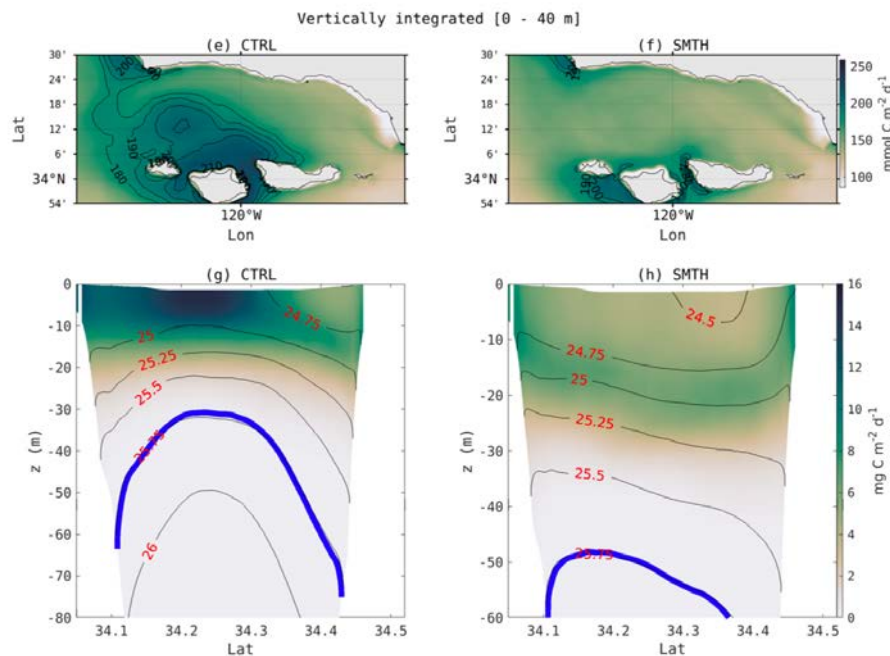
Summary

The Ocean-Atmosphere interactions have a large influence on the climate and on the ecosystems at the basin scale. The main climatic modes of variability (e.g., El Niño, NAO, ...) are coupled modes between the Ocean and the Atmosphere. The ecosystems have a strong response to those variations through the influence of the wind, the light, and the temperature on the nutrient stock and, thus, on the primary production and the oxygen concentration. Systematic biases in sea surface temperature in global models have highlighted the limitations of studies based on the global models and have, thus, spurred the investigation of the Ocean-Atmosphere interactions based on the high-resolution modeling approach. In the past few years, it has been demonstrated that fine scale processes such as e.g., Ocean-Atmosphere interactions can strongly modulate the variability and the mean physical and biogeochemical state of the ocean. In this presentation, the focus will be on the influence of fine-scale oceanic and atmospheric processes, including air-sea interactions, on the ocean dynamics and the biogeochemical variability. Using a set of regional and global coupled ocean and atmosphere models over different regions of the World Ocean, I will illustrate to which extent fine-scale processes can control the exchange of energy between the Ocean and the Atmosphere, the ocean dynamics, and the net primary production and oxygen concentration.

Brief biography

My work is multi-disciplinary, with main contributions to physical oceanography, ocean-atmosphere interactions, with far-reaching impacts on ocean biogeochemistry and bio-physical interactions. The tools I have shown expertise span from numerical ocean models to satellite and in situ observations of the ocean and surface meteorology. Since my PhD I obtained in 2008, I developed my line of research from the following postulate: in order to understand the ocean and marine ecosystems evolution and thus the impact of climate change, it is key to develop an integrated approach based on the understanding of physical phenomena and their interactions with the ecosystem at relevant spatial and temporal scales. I applied my approach over different regions of the World ocean, including Eastern and Western Boundary Current Systems, the Mediterranean Sea, and also more recently a global approach. Among my significant accomplishments I would highlight two categories. The first category addresses the origin and consequences of the slackening of the wind (the wind "drop-off") in Eastern Boundary Upwelling Systems. I demonstrated its importance in determining the mean and mesoscale oceanic circulation, and, overall, the net primary production. More importantly, as a second achievement, I would cite my recent work on the mechanical interaction between the ocean surface currents and the atmosphere, the so-called Current Feedback,

which describes how surface ocean currents affect the surface winds and the ocean in profound ways, one of which is to attenuate small-scale ocean eddies and controlling Western Boundary Currents. My results have crucial implications on nutrient distributions and effects on coastal ecosystems and biogeochemical cycles.



Impact of fine-scale wind on the net primary production over the Santa Barbara Chanel. The simulation CTRL considers the fine-scale wind whereas SMTH has a smoothed wind that does not represent it. SMTH does not simulate realistically the (sub)mesoscale activity and the associated bloom, while in CTRL the fine-scale wind causes an intensification of the (sub)mesoscale activity and, thus, a larger primary production.

References

- Renault, L., Masson S., Arsouze, T., et al., 2020. How to Best Force an Ocean Model Dynamics. Journal of Advances in Modeling Earth Systems: e2019MS001715
- Kessouri, F., Bianchi, D., Renault, L., et al. 2020. Role of Submesoscale Processes on the Biogeochemistry of the California Current Ecosystem. Global Biogeochemical Cycles, 34, e2020GB006578.
- Renault, L., et al. 2019: Remarkable Control of Western Boundary Currents by Eddy Killing, a Mechanical Air-Sea Coupling Process. Geophysical Research Letters, 46, 2743-2751.
- Renault, L., Deutsch, C., McWilliams, J.C., et al. 2016a. Partial decoupling of primary productivity from upwelling in the California Current System. Nature Geoscience, 9, 505.

Link to the talk

<https://balanbbb.corp.csic.es/playback/presentation/2.0/playback.html?meetingId=39e63db6a0e3ab441bbbeb30455d377f53322a94-1633687220234>

Mercury: biogeochemistry and impact in the global ocean

Dr. Andrea G. Bravo

Departament de Biologia Marina i Oceanografia, Institut de Ciències del Mar

Divendres, 15 d'octubre de 2021

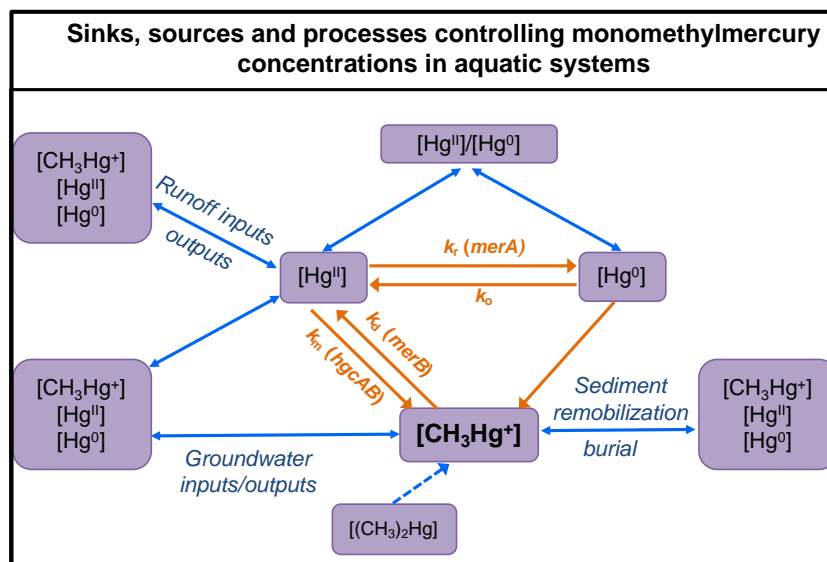
Summary

As recent as 2013, over 130 countries signed the Minamata Convention, a global treaty to protect human health and the environment from the adverse effects of mercury. Despite the strong global concern on mercury, in particular its organic chemical form monomethylmercury (MeHg), which is one of the top ten chemicals of public health concern, little is known about the fundamental mechanistic understanding of MeHg degradation in the environment. Key biological processes govern the formation and degradation of MeHg. While it is known for long time that biological MeHg degradation is mediated by the mer operon (Barkay et al., 2003), the gene cluster *hgc*, involved in microbial MeHg formation, was recently unveiled (Parks et al., 2013). The recent discovery of the *hgc* opened a new, rapidly expanding, research direction in mercury biogeochemistry science which has dramatically advanced our understanding of the taxonomic identity and complexity of microbial communities involved in MeHg. However, it still remains uncertain if rates of MeHg formation are constrained by the molecular-level methylation/demethylation processes mediated by the *hgc* genes. Furthermore, attempts to parameterize accurate predictive models for MeHg formation rate or concentration in the environment have so far not been successful. This significantly restrains our fundamental understanding of Hg's biogeochemical cycle and ability to predict MeHg exposure to wildlife or humans. In my talk I will talk about the current state of the art of the biogeochemical processes governing MeHg formation and degradation processes in aquatic systems. In particular, I will show how combining metagenomic and metatranscriptomic data (Figure 1) with a detailed characterization of mercury chemical speciation but also with marine isolates provides a refined understanding of limiting factors for MeHg formation and thus enable refined predictions of MeHg levels in the Sea.

Brief biography

My research focuses on the biogeochemistry of mercury in aquatic and terrestrial ecosystems, with mercury and the factors determining the formation and degradation of its organic form methylmercury, which bioaccumulated and biomagnifies in aquatic food webs. I obtained my PhD in Environmental Sciences in Switzerland (Geneva University, 2010), where I mainly worked on the impacts of chlor-alkali and sewage treatment plants in freshwaters. Afterwards, I obtained a project by the Swedish Research Council to move to Sweden and work as a post-doc (Uppsala University, 2012-2014) on the role of organic matter on mercury chemical speciation in the landscape. My postdoc positions in Sweden included 3 additional years at Uppsala University (2014-2016), funded by the international SMarRef Project where I acted as a Work Package leader, and 4 months at Umeå University (2017). In 2017 I obtained a Beatriu de Pinós post-doc grant from the Generalitat

de Catalunya to move to the IDAEA-CSIC in Barcelona to study the key organic molecules driving methylmercury formation. I had to ceased this postdoc when I obtained a IF- Marie Curie (Mer-Cure) from the European Commission, to work on mercury cycling in the ocean at the Institute of Marine Sciences ICM-CSIC (2018-2020). In 2020 I obtained a Plan Nacional for young researchers (JIN) for studying the role of submarine discharge waters in mercury concentrations and biogeochemical processes occurring at the terrestrial-marine interface. Also in 2020, I obtained a Ramón y Cajal contract (ICM-CSIC). My research has received the 2013 Early Career Research Award by King Carl XVI Gustaf of Sweden and, more recently, the 2019 Raymond L. Lindeman Award from the Association for the Sciences of Limnology and Oceanography – ASLO.



References

- Barkay, T.; Miller, S. M.; Summers, A. O (2003). Bacterial Mercury Resistance from Atoms to Ecosystems. *FEMS Microbiol. Rev.* 27 (2–3), 355–384.
- Parks JM, Johs A, Podar M, Bridou R, Hurt RA Jr, Smith SD, Tomanicek SJ, Qian Y, Brown SD, Brandt CC, Palumbo AV, Smith JC, Wall JD, Elias DA, Liang L (2013). The genetic basis for bacterial mercury methylation. *Science* 339 (6125): 1332–1335

Biomolecular simulations à la carte: from biomedical to marine sciences

Dr. Francesco Colizzi

Departament de Biologia Marina i Oceanografia, Institut de Ciències del Mar

Divendres, 5 de novembre de 2021

Summary

Molecular dynamics simulations serve as a computational microscope to capture, with atomistic spatiotemporal resolution, key processes in molecular biology and drug discovery. Simulations have proven valuable in deciphering functional mechanisms of proteins, nucleic acids and other biomolecules, in uncovering the structural basis for disease, and in the design and optimization of small molecules, peptides, and proteins. Whereas molecular simulations have dramatically impacted the advancements of the biomedical field, their applications to marine-related problems is rare and traditionally overlooked. During this seminar I will present, in a very general way, some recent biomedical and biophysical applications of molecular dynamics simulations, and I will discuss (and accept suggestions for) their potential use in marine sciences. The versatility of molecular dynamics simulations and their complementarity with experiments will be highlighted.

Brief biography

The leitmotiv of my research is the disentanglement, by means of (mostly) biomolecular simulations, of the relationships linking structure, dynamics, and function of different molecular systems ranging from small organic molecules, pharmaceutical ligand-target complexes, to protein-protein assemblies and large nucleic-acid processing machineries. My scientific trajectory has led me over the years to move across different geographical and thematic areas; from Italy to Switzerland, United States, Canada, and ultimately to Spain; from molecular modeling to drug discovery, computational chemistry, computational biophysics, and ultimately enzyme engineering. Such mobility has hopefully enhanced my capability to integrate knowledge from different fields for the development of transdisciplinary projects. Currently, I aim at tackling challenging questions in different areas of marine sciences from a molecular perspective. In 2021, I joined ICM where I am building a biomolecular simulations framework that I enjoy calling "Molecular Ocean Lab".



Graphical view of the different conformations adopted by a flexible small molecule. Colors represent different pools of conformations.

References

- Probing allosteric regulations with coevolution-driven molecular simulations (2021). F Colizzi, M Orozco. *Science advances* 7 (37), eabj0786
- Asymmetric base-pair opening drives helicase unwinding dynamics (2019). F Colizzi, C Perez-Gonzalez, R Fritzen, Y Levy, MF White, JC Penedo, et al. *Proceedings of the National Academy of Sciences* 116 (45), 22471-22477
- Promoting transparency and reproducibility in enhanced molecular simulations (2019). M Bonomi, G Bussi, C Camilloni, GA Tribello, P Banáš, A Barducci, and the PLUMED Consortium. *Nature methods* 16 (8), 670-673

Link to the talk

<https://www.youtube.com/watch?v=phB3jPiISfQ>

The architecture of biodiversity

Dr. Jordi Bascompte

Department of Evolutionary Biology and Environmental Studies, University of Zurich, Switzerland

Premi Ramon Margalef 2021

Dilluns, 8 de novembre de 2021

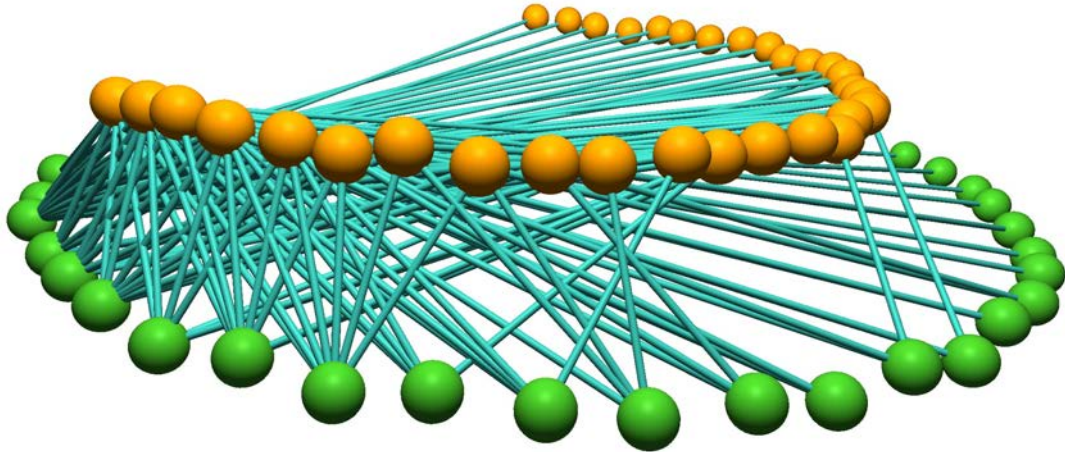
Summary

The mutualistic interactions between plants and the animals that pollinate them or disperse their seeds form complex networks involving dozens or hundreds of species. These coevolutionary networks are highly heterogeneous, nested, and built upon weak and asymmetric links among species. Such general architectural patterns maximize the number of coexisting species and increase the range of variability that these mutualistic networks can withstand before one or more species go extinct. As a result of such interdependence, however, species extinctions induced by climate change may trigger coextinction cascades, thus driving extinct many more species than originally predicted. More importantly, these coextinction cascades may change the way extant species are selected from the evolutionary tree, with potential implications for the functioning, robustness, and coevolution of the resulting communities.

Brief biography

Jordi Bascompte is Professor of Ecology at the University of Zurich and Director of its Specialized Master on Quantitative Environmental Sciences. He is mostly well-known for having brought the interactions of mutual benefit between plants and animals into community ecology, at the time largely dominated by predation and competition. His application of network theory to the study of mutualism has identified general laws that determine the way in which species interactions shape biodiversity. Jordi is one of the most highly cited scientists according to Thompson Reuters. Among his distinctions are the European Young Investigator Award (2004), the Ecological Society of America's George Mercer Award (2007), the Spanish National Research Award (2011), the British Ecological Society's Marsh Book of the Year Award (2016), and the Ramon Margalef Prize in Ecology (2021). Recipient of an ERC's Advanced Grant, Jordi has served in the Board of Reviewing Editors of Science and has been the Ideas and Perspectives Editor at Ecology Letters. Among his books are *Self-Organization in Complex Ecosystems* (with R.V. Solé) and *Mutualistic Networks* (with P. Jordano), both published by Princeton University Press.

Jordi obtained a PhD in Biology by the University of Barcelona (1994), supervised by Ricard V. Solé. This was followed by a postdoctoral position in Steven Frank's laboratory at the University of California, Irvine (1996 and 1997). After that, he was awarded an independent postdoctoral fellowship at the National Center for Ecological Analysis and Synthesis (NCEAS, 1998 and 1999). In 2000, he became Associate Professor (Full Professor from 2008) at the Doñana Biological Station, a center of the Spanish Research Council, where he was based until moving to Zurich in 2015.



The structure of a plant-animal mutualistic network. Animal species (orange dots) interact with plant species (green dots) mostly as seed dispersals or pollinators

References

- Bascompte, J., Jordano, P., Melián, C.J., Olesen, J.M. 2003. The nested assembly of plant-animal mutualistic networks. PNAS 100, 9383–9387.
- Bascompte, J., Jordano, P. 2007. Plant-animal mutualistic networks: The architecture of biodiversity. Annual Review of Ecology, Evolution, and Systematics, 2007, 567–593
- Cámara-Leret, R., Bascompte, J. 2021. Language extinction triggers the loss of unique medicinal knowledge. PNAS 118, e2103683118

Link to the talk

<https://youtu.be/fhymKHtRSTQ>

Relación ciudadano-río: una mirada desde la ciencia ciudadana en Colombia y Cataluña

Jeymmy Walteros Rodríguez

Universidad Tecnológica de Pereira, Colombia

Divendres, 12 de novembre de 2021

Resumen

Los ríos urbanos fueron considerados por años, espacios naturales que llevaban aguas residuales, basuras, incluso lugares poco agradables e inseguros para los ciudadanos. Sin embargo, desde el 2000 comienza un proceso de transformación en las políticas de gestión, que invitan a sanear los ríos, teniendo presente la participación ciudadana. Es un momento en que los ciudadanos vuelven a ver los ríos de frente, en parte por los diferentes procesos de recuperación y restauración de sus riberas. En Colombia las políticas como la del recurso hídrico y de biodiversidad y servicios ecosistémicos, están en coherencia con el propósito de la Directiva Marco del Agua de la Unión Europea, que define la necesidad de sanear los ríos y reconocer y mantener su estado ecológico. Para esto es importante, no solo fortalecer los programas de biomonitoreo acuático que permita una visión integral de los ríos como sistemas naturales, dinámicos y complejos, sino también la participación y co-creación de estos programas con los ciudadanos, quienes son los veedores de estos procesos que pueden mantenerse en el tiempo. En esta charla mostraré un marco conceptual de los procesos participativos adelantados en la ciudad de Pereira-Colombia y lograré un análisis comparativo con los programas de biomonitoreo acuático soportado en la ciencia ciudadana, a partir del modelo de referencia en Cataluña y apoyado por el grupo de investigación Freshwater Ecology, Hydrology and Management (FEHM-Lab) de la Universidad de Barcelona.

Breve biografía

Candidata a doctora en Ciencias Ambientales, con Maestría en este mismo campo de la Universidad Tecnológica de Pereira, cuenta con formación de base en biología marina. Además de la docencia y la academia, participa como co-investigadora en el grupo Ecología, Ingeniería y Sociedad-EIS de la Universidad Tecnológica de Pereira. Las líneas de investigación donde se desempeña son la limnología, con énfasis en el biomonitoreo acuático y la ciencia ciudadana. Jeymmy actualmente se encuentra ejerciendo diferentes roles en el ámbito académico y profesional. Es docente catedrática de la universidad en la cual se encuentra formándose como PhD. Es coordinadora nacional de la red colombiana de Limnología-NeoLimnos, además de ser parte del comité directivo de la red Macrolatinos@, una red de investigadores de todo el mundo que comparten un interés en común: el estudio de los macroinvertebrados acuáticos y la biodiversidad de los ecosistemas acuáticos en América Latina y el Caribe y es miembro de la Red Iberoamericana de Ciencia Participativa-RICAP. Actualmente se encuentra realizando una estancia doctoral con el grupo de investigación Freshwater Ecology, Hydrology and Management (FEHM-Lab) de la Universidad de Barcelona. Web personal: <https://jeymmywalteros.wixsite.com/womaninscience>.

Urge estrechar los vínculos sociedad - naturaleza, así como volvernos más competentes para la resolución de los problemas ambientales que evidenciamos en nuestros ríos.



References

- Lindsey, N. J., and E.X. Martin (2021). Fiber-Optic Seismology, *Annu. Rev. Earth Planet. Sci.*, 49, 309–36, doi: 10.1146/annurev-earth-072420-065213.
- Chandler, M., See, L., Copas, K., Bonde, A. M., López, B. C., Danielsen, F., ... & Turak, E. (2017). Contribution of citizen science towards international biodiversity monitoring. *Biological conservation*, 213, 280-294.
- Krabbenhoft, C. A., & Kashian, D. R. (2020). Citizen science data are a reliable complement to quantitative ecological assessments in urban rivers. *Ecological Indicators*, 116, 106476.
- Ladrera, R., Rodríguez-Lozano, P., Verkaik, I., Prat, N., & Díez, J. R. (2020). What do students know about rivers and their management? Analysis by educational stages and territories. *Sustainability*, 12(20), 8719.
- Pabón, R. (2018). Apropiación social del conocimiento: una aproximación teórica y perspectivas para Colombia. *Educación y Humanismo*, 20(34), 116-139.
- Soria, M., Bonada, N., Ballester, A., Verkaik, I., Jordà-Capdevila, D., Solà, C., ... & Cid, N. (2021). Adapting participatory processes in temporary rivers management. *Environmental Science & Policy*, 120, 145-156.

Link to the talk

<https://youtu.be/wCmXUcKnsaY>

Lobelia, bringing climate science closer to society

Laia Romero & Suso Peña Izquierdo

Lobelia Earth, Parc Tecnològic, Barcelona

Dijous, 18 de novembre de 2021

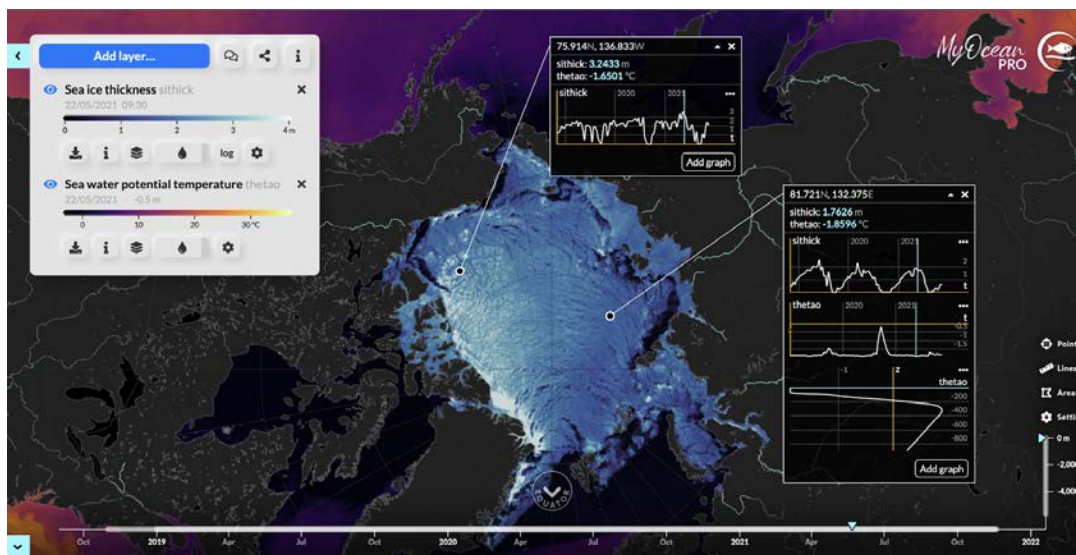
Summary

Lobelia Earth is an SME based in Barcelona, specializing in satellite technology and climate science. We rely on computational intelligence and data visualization to promote climate action. Lobelia Earth was born in November 2018 as the downstream-services unit of isardSAT Group, a leading expert on satellite technologies, satellite mission design and implementation as well as on proprietary algorithms for the application of satellite technology for both the climate and the environment since 2006. Droughts, floods, atmospheric pollution and climate are activity domains tackled by Lobelia. Both geospatial data and infrastructure-based services are supported by the organisation, that counts with a product development team specialized in data management and visualization, with scientists, engineering developers, designers, and business developers working hand by hand to provide valuable products in a timely and reliable manner. Lobelia has placed two products on the market: TeroMaps© technology, serving the visualisation of Copernicus and Sentinel data in the WEkEO DIAS cloud and CMEMS MyOcean Viewer. The Lobelia Air© service, an operational air quality monitoring and forecasting prototype that has revolutionised air pollution action plans in Barcelona and Madrid, and was presented in COP25 officially in favour of sustainability and smart mobility strategies. Lobelia is an active partner of the Coalition for Climate Resilient Investment, (CCRI), a UN COP26 Flagship, where the company acts as a climate risk data provider to several end-to-end pilots addressing drought and extreme precipitation. In line with our mission of exploiting science and technology to enrich society, Lobelia has developed innovative and engaging initiatives for science dissemination like the UTCl story hub, the Past Climate Explorer or the stories about Marine Heatwaves and the evolution of the Arctic sea-ice. Lobelia is a pioneering company that develops insightful platforms grounded on scientific knowledge and radically new software technologies, and paves the way towards a zero-carbon economy.

Brief biography

Laia Romero is Co-founder and Managing Director of Lobelia Earth. She is responsible for systems development and operational services. Over the last 15 years she has worked extensively in Earth Observation with radar technologies, in the development and procurement of geoinformation systems, deployment and execution of services. Before joining isardSAT, Laia was Director of New Business and Innovation at Altamira Information (CLS Group), where she managed the division of R&D and Data Management Solutions. Prior to that, she held the position of Information Systems Manager, in which she managed the development life cycle of operational contracts such as the Copernicus Marine Service and commercial international contracts involving the development, integration, verification, and operations of large information systems. Laia has solid experience in

project management and technical coordination in numerous ESA contracts. She has vast experience with Copernicus data and Information, and cloud infrastructure services, such as the TEPs and the DIAS. **Suso Peña-Izquierdo** is a Climate Data Scientist, graduated in Physics, PhD in Physical Oceanography, he has 12 years of experience in climate science research having worked in different international institutions (ICM, SCRIPPS-SIO, UNSW-CCRC, UCM, BSC). During his early years as oceanographer he specialized in large-scale ocean circulation developing an extensive expertise in working with diverse types of data sources including; acquisition and process of in-situ measurements in oceanographic cruises, collection and analysis of heterogeneous historical observations and generation of lagrangian simulations from numerical models. All this experience working with data led him to work within one of the first international attempts of establishing a standardized quality control framework for the massive and heterogeneous collection of climate datasets included in the Copernicus Climate Data Store. He was the leader of the reanalysis evaluation team (evaluating popular products such as ERA5 or UERRA) in charge of developing and implementing a pre-operational quality control service. He has been progressively interested in applied science, so he extended his data analysis expertise with a postgraduate education on machine learning which he has successfully applied in fields like weather nowcasting, downscaling of climate models and river discharge prediction. With this spirit, he joined Lobelia Earth in 2020 aiming to apply his scientific experience to solve real-world problems transforming data into actionable insights.



Example of the CMEMS My Ocean Viewer developed by Lobelia

References

www.lobelia.earth/es - myocean.marine.copernicus.eu/data - utci.lobelia.earth - era5.lobelia.earth - dtop-marine-heatwaves.lobelia.earth - dtop-arctic.lobelia.earth

Link to the talk

<https://youtu.be/-Qm2SmmVjhE>

El futur de l'energia: els anys decisius

Dr. Antonio Turiel

Departament d'Oceanografia Física i Tecnològica, Institut de Ciències del Mar

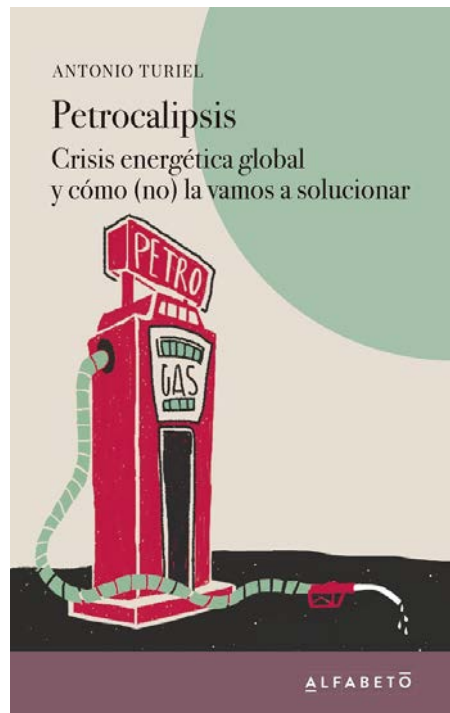
Dimarts, 23 de novembre de 2021

Resum

En els últims temps sentim informacions que posen l'energia, o més aviat la seva escassetat, al centre de la notícia. Falta gas a Europa i l'electricitat està pels núvols, falta carbó a Àsia i la Xina i l'Índia pateix apagades, el petroli va pujant, el transport marítim s'encareix, falten camioners pels baixos sous i les pèssimes condicions laborals, falten tot tipus de matèries primeres i elaborades... i ara a sobre l'Algèria ens talla el gas mentre ens diuen que podria arribar una gran apagada al cor d'Europa- Fa 12 anys vam fer la primera xerrada sobre energia a l'ICM (aleshores amb el Jordi Solé), i avui mirarem on hem anat des d'aleshores i cap a on podríem i hauríem d'anar a partir d'ara. Posarem el focus en què passarà aquest hivern, què passarà l'any vinent, què passarà d'aquí a 2025 i d'aquí a 2030. I encetarem la discussió de com afecta tot això, a nivell pràctic, al quefer de l'ICM.

Breu biografia

Antonio Turiel és llicenciat en Física, llicenciat en Matemàtiques i doctor en Física Teòrica per la Universitat Autònoma de Madrid. Treballa com a Investigador Científic a l'Institut de Ciències del Mar del Consell Superior d'Investigacions Científiques. És autor de més de 90 articles científics especialitzats, així com d'una patent, i ha dirigit cinc tesis doctorals. És també conegut com a divulgador científic i redactor principal del blog *The Oil Crash*, en el qual tracta temes sensibles sobre l'esgotament dels recursos convencionals de combustibles fòssils, com ara el pic petrolier i les seves possibles implicacions a escala mundial. També advoca pel decreixement, i és crític amb les postures d'ideologia productivista dels diversos sistemes polítics tant des de la dreta com des de l'esquerra. El 2020, publicà l'assaig *Petrocalipsis: Crisis energética global y cómo (no) la vamos a solucionar*, on alerta que ni les energies renovables ni les propostes tecnològiques són la solució als reptes de futur. Atès les dimensions de la crisi energètica, els límits de les renovables i les ineficiències de l'«hidrogen verd», no hi haurà mai prou producció d'hidrogen verd a Europa per cobrir les seves pròpies necessitats actuals.



References

<https://crashoil.blogspot.com/>

<https://www.eltemps.cat/article/13509/entrevista-antonio-turiel>

Link to the talk

<https://www.youtube.com/watch?v=tkG4EXOORtE>

SOS océanos: un espacio operativo seguro (Safe Operating Space) para especies y ecosistemas marinos altamente impactados

Dr. Francisco Ramírez

Departament de Recursos Marins Renovables, Institut de Ciències del Mar

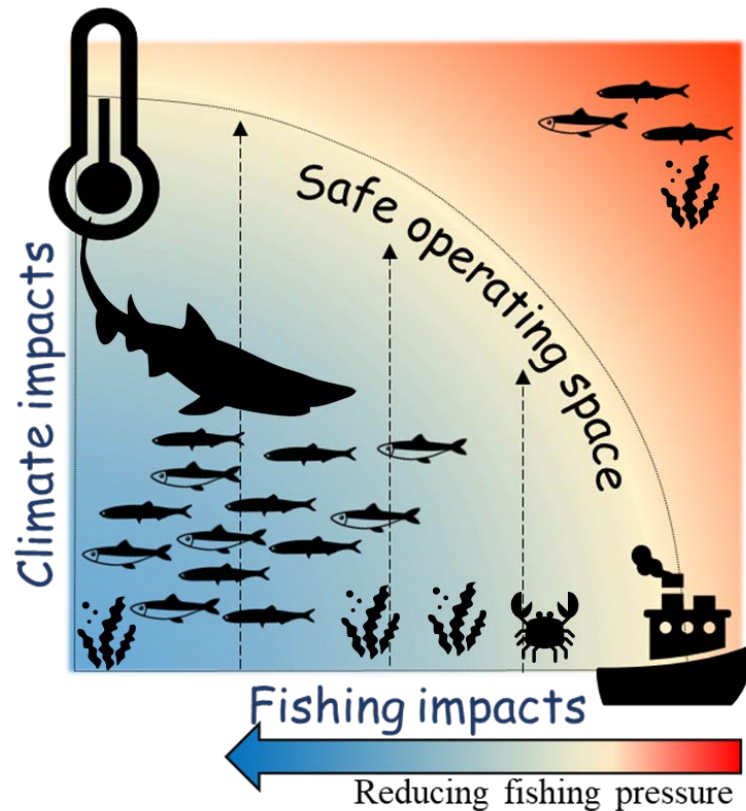
Divendres, 26 de novembre de 2021

Resumen

La identificación de especies y ecosistemas altamente impactados que merecen acciones de gestión y conservación urgentes es un desafío social importante que puede contribuir a adaptar y mitigar las consecuencias ambientales del 'Cambio Global'; así como al necesario cambio hacia la sostenibilidad de nuestras actividades. Sin embargo, esto puede representar un desafío importante para la conservación de los ecosistemas marinos debido a la dificultad de construir enfoques o aproximaciones holísticas que permitan evaluar qué áreas están más impactadas o cómo las especies responden a estos impactos. En este seminario explicaré cómo a lo largo de los últimos años he intentado contribuir a este campo de conocimiento combinando estudios multidisciplinares sobre evaluación de impactos (climáticos y antrópicos), respuestas biológicas, y su aplicación a la conservación mediante la adaptación del concepto SOS (Safe Operating Space) para la gestión de áreas y especies marinas altamente impactadas.

Breve biografía

Francisco Ramírez es Doctor en Biología por la Universidad de Barcelona. Después de varias estancias postdoctorales en la Estación Biológica de Doñana (CSIC) y en la Universidad de Barcelona como Juan de la Cierva-Incorporación, en 2020 se incorporó al Instituto de Ciencias del Mar (ICM) en el marco del proyecto europeo TRIATLAS, bajo la supervisión de Marta Coll. Recientemente ha sido contratado con una de las becas postdoctorales asociadas a la 'Severo Ochoa' y le ha sido concedida una ayuda Ramón y Cajal (2020), con la que continuará su investigación en el ICM durante los próximos años. Es autor de 60 artículos científicos especializados y ha dirigido dos tesis doctorales. A lo largo de los últimos años, su investigación se ha focalizado en el estudio y conservación de la biodiversidad marina y de determinadas especies clave, contribuyendo a este campo de conocimiento mediante (i) la generación de información actualizada y de alta resolución espacio-temporal sobre los impactos climáticos y humanos en los ecosistemas marinos; (ii) el conocimiento de las consecuencias biológicas del cambio climático y determinadas actividades humanas como la pesca; (iii) la generación de nuevas aproximaciones en la hora de diseñar medidas de gestión eficaces para la conservación de la biodiversidad marina.



References

- Afán, I., Chiaradia, A., Forero, M.G., Dann, P., Ramírez, F., 2015. A novel spatio-temporal scale based on ocean currents unravels environmental drivers of reproductive timing in a marine predator. *Proc. R. Soc. B* 282, 20150721.
- Ramírez, F., Afán, I., Davis, L.S., Chiaradia, A., 2017. Climate impacts on global hot spots of marine biodiversity. *Science Advances* 3, e1601198.
- Ramírez, F., Afán, I., Tavecchia, G., Catalán, I.A., Oro, D., Sanz-Aguilar, A., 2016. Oceanographic drivers and mistiming processes shape breeding success in a seabird. *Proc. R. Soc. B* 283, 20152287.
- Ramírez, F., Coll, M., Navarro, J., Bustamante, J., Green, A.J., 2018. Spatial congruence between multiple stressors in the Mediterranean Sea may reduce its resilience to climate impacts. *Scientific Reports* 8, 14871.
- Ramírez, F., Pennino, M.G., Albo-Puigserver, M., Steenbeek, J., Bellido, J.M., Coll, M., 2021. SOS small pelagics: a Safe Operating Space for small pelagic fish in the Western Mediterranean Sea. *Science of The Total Environment* 756, 144002.

Link to the talk

https://youtu.be/ipebwFIO3_Q

La geomicrobiología de un sistema gaiano: el subsuelo profundo

Dr. Ricardo Amils

Centro de Astrobiología (INTA-CSIC), Centro de Biología Molecular (CBM-UAM)

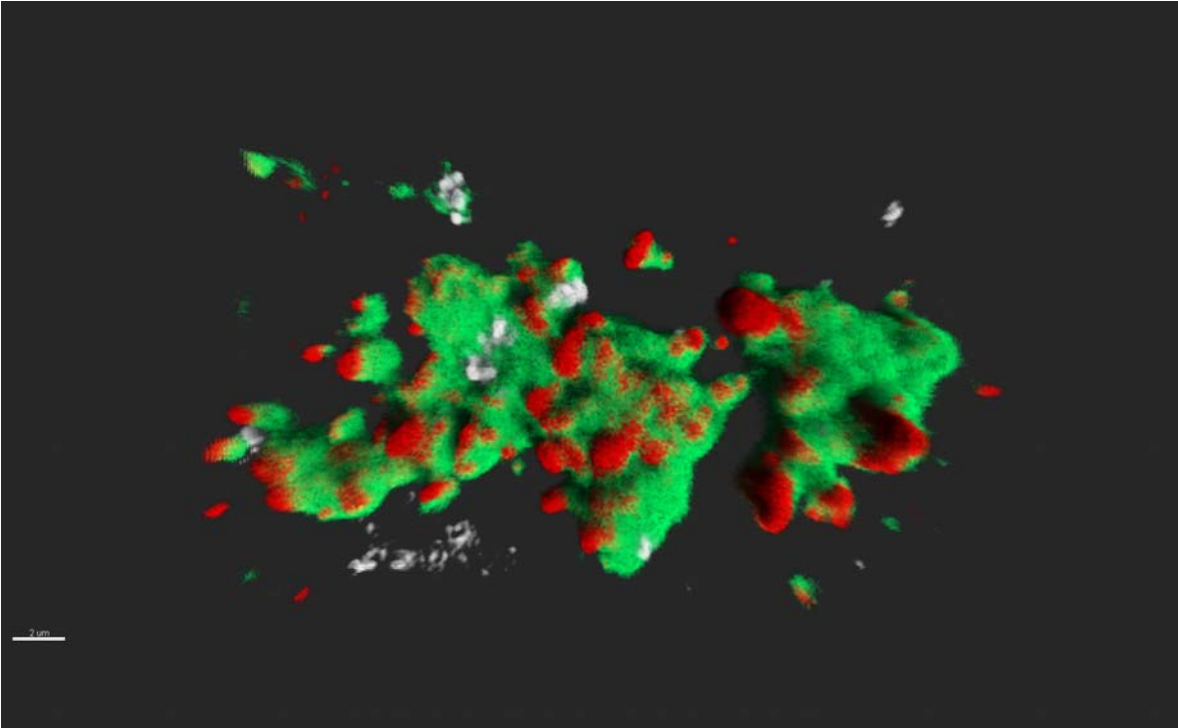
Divendres, 3 de desembre de 2021

Resumen

Han pasado casi doscientos años desde que Darwin predijera la existencia de vida en el subsuelo profundo, en condiciones oligotróficas extremas y en ausencia de radiación solar. La geomicrobiología de la denominada biosfera oscura es también de interés en astrobiología, como modelo de vida temprana en la Tierra y en otros cuerpos planetarios. La mayor parte de los estudios de vida en el subsuelo profundo se han realizado a partir de muestras de pozos artesianos, los cuales han reportado interesante información sobre la diversidad existente en el mismo, aunque no pueden aportar información sobre su interacción con la matriz sólida geológica en la que se desarrollan. En esta comunicación se presentaran los resultados geomicrobiológicos obtenidos en una perforación dedicada de 620 metros de profundidad realizada en la Faja Pirítica Ibérica. En la misma se ha podido demostrar el funcionamiento acoplado de los ciclos biogeoquímicos fundamentales (C, H, N, S y Fe) en el subsuelo profundo de la Faja Pirítica Ibérica, así como el papel crítico que juega en el ecosistema el ciclo del nitrógeno.

Breve biografía

Nacido en Barcelona (1947). Licenciado en Ciencias Químicas (U. Barcelona), Doctor en Ciencias (U. Autónoma de Barcelona). Profesor Emérito de Microbiología en la U. Autónoma de Madrid, Investigador Senior del Centro de Astrobiología. Ha participado activamente en proyectos estudiando la fisiología de microorganismos termófilos, la inhibición de la degradación de proteínas en hígado en regeneración, la reconstitución total de ribosomas halófilos y termófilos, la evolución de los lugares de interacción de inhibidores de la síntesis de proteínas, genómica de microorganismos halófilos extremos, ecología molecular de ambientes ácidos extremos, geomicrobiología del subsuelo profundo de la Faja Pirítica Ibérica (FPI) y el estudio de ambientes extremos como análogos terrestres de interés astrobiológico. En los últimos treinta y cinco años ha dedicado una parte importante de su investigación a la caracterización geomicrobiológica del ambiente ácido extremo del Río Tinto, su origen y la diversidad procariótica y eucariótica de la columna de agua, las biopelículas y los sedimentos. En los últimos años ha dirigido un proyecto Advance ERC dedicado a la caracterización geomicrobiológica del subsuelo profundo de la FPI con el fin de demostrar que las condiciones extremas existentes en la cuenca del Río Tinto son la consecuencia de la actividad de un biorreactor subterráneo. La caracterización geomicrobiológica de la cuenca del Río Tinto realizada por su grupo ha permitido que dicho ecosistema se considere uno de los mejores análogos geoquímicos y mineralógicos terrestre del planeta Marte.



Hibridación in situ fluorescente de una biopelícula a 414 metros de profundidad en la que se pueden ver las bacterias en rojo inmersas en exopolisacáridos en verde

References

- Escudero, C., Vera, M., Oggerin, M., Amils, R. (2018) Active microbial biofilms in deep continental subsurface porous rock samples from the Iberian Pyrite Belt. *Scientific Reports*, **8**: 1538 doi: 10.1038/s41598-018-19903-z.
- Escudero, C., del Campo, A., Ares, J.M., Sánchez, C., Martínez, J.M., Gómez, F., Amils, R. (2020) Analysis of microorganism-mineral interaction in the Iberian Pyrite Belt subsurface: the *Acidovorax* case. *Frontiers Microbiology*, **11**, e572104 doi: 10.3389/fmicb.2020.572104.
- Sanz, J.L., Rodríguez, N., Escudero, C., Amils, R. (2021) Biological production of H₂, CH₄ and CO₂ in the deep subsurface of the Iberian Pyrite Belt. *Environ. Microbiol.*, **23**(7), 3913-3922 doi: 10.1111/1462-2920-15561

Link to the talk

<https://youtu.be/8wXxYiftQxs>

Sumérgete en la web interactiva PlanctON

Mikel Rodríguez Hidalgo

Il·lustrador i dissenyador científic freelance en Mikelgraphicscience

Divendres, 10 de desembre de 2021

Resumen

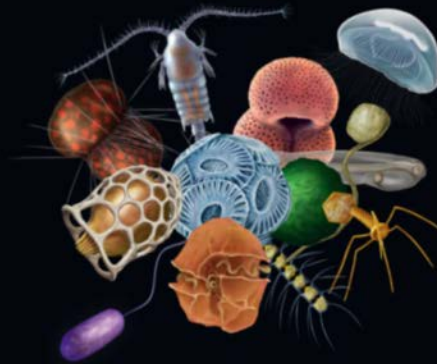
Vivimos en un entorno cada vez más visual y con mayor acceso a la información, en el que a menudo nos vemos saturados por la cantidad de datos y nos resulta difícil diferenciar cuales son de calidad o fiables. Sin duda ante esta realidad, nos hemos vuelto más críticos con el modo de informarnos y exigimos a los medios ser más atractivos para captar nuestra atención. Frente a esta tendencia, la ciencia no debe quedarse atrás en su labor divulgativa. Cada vez son más científicos los que buscan colaborar con diseñadores de la información que conviertan sus resultados en piezas de información visuales, comprensibles y atractivas. El objetivo puede ser llamar la atención en conferencias, aumentar las probabilidades de publicar en cierta revista, crear una campaña educativa con una buena acogida por la sociedad... La web interactiva del proyecto PlanctON es un ejemplo de comunicación científica adaptada a las necesidades de hoy día, en la que se combina la ciencia con el diseño web, la animación y la ilustración científica, para crear una experiencia en la que el usuario disfruta aprendiendo. Navegar a través de este mar de plancton resulta intuitivo, los conceptos complejos se muestran de forma jerarquizada y sencilla para ayudar en su comprensión y el formato moderno adaptable a ordenadores y móviles ayuda en su potencial de difusión.

Breve biografía

Me llamo Mikel Rodríguez y soy diseñador de la información especializado en visualización de datos, infografía e ilustración científica. Mi perfil multidisciplinar como creativo y científico me permiten crear desde páginas webs atractivas hasta infografías efectivas que ayudan a comunicar proyectos científicos y aumentar su potencial de difusión. En mi trabajo, combino el conocimiento adquirido durante mi carrera en la rama científica, con mis capacidades comunicativas y habilidades creativas. En cuanto al campo científico, realicé dos grados en Ciencias del Mar y Ambientales y un máster en Acuicultura. Para completar mi perfil creativo, cursé un postgrado en ilustración científica y un master en infografía y visualización de datos. Además de asistir a numerosos cursos especializados en ilustración médica, botánica, de aves, organismos marinos. Durante mi trayectoria he trabajado en agencias de comunicación, revistas científicas, instituciones internacionales y centros de investigación. Antes de comenzar el proyecto Mikel Graphicscience, trabajé como diseñador de la información e interacción en la agencia de comunicación científica Scienseed, trabajando para clientes de todo el mundo. También he realizado trabajos para la edición española de la revista Scientific American (Investigación Y Ciencia), destacando la creación de una de sus portadas. Además de ayudar a diversas universidades y centros de investigación con mis infografías. En 2019 fuí seleccionado finalista en el concurso internacional de ilustración científica Illustraciencia. Y recientemente he comenzado a colaborar con marcas comerciales junto al equipo de comunicadores científicos Element 119.

PlanctON

Sota les onades de l'oceà es belluguen una immensitat d'espècies. Moltes les coneixem però, t'has plantejat mai que algunes arriben a ser tan petites que no poden ser vistes a simple vista? Submergeix-te en el mar d'espècies que es deixen portar pel vaivé de les ones.
Descobriràs el plàncton, un món fascinant!



References

Cairo, A. (2016). Truthful Art, The: Data, Charts, and Maps for Communication. Addison Wesley.

Cairo, A. (2011). El Arte Funcional, Infografía y Visualización de datos. Alamut.

Link to the talk

https://youtu.be/i_4KhRhN0zY

Observations of mesoscale and submesoscale phenomenology in the Gulf of Mexico using gliders

Dr. Enric Pallàs-Sanz

Centro de Investigación Científica y de Educación Superior de Ensenada, Baja California, México

Dimecres, 15 de desembre de 2021

Summary

The Group of Monitoring the Ocean with Gliders (GMOG) has been monitoring the Gulf of Mexico (GoM) quasi-continuously between 2016 and 2019; gathering thousands of vertical profiles of essential oceanic variables at a horizontal resolution never attained before of 2-5km. In this talk, relevant glider and Argos observations are shown that shed some light on a variety of mesoscale and submesoscale processes that occur in the GoM: (i) the transformation of North Atlantic Subtropical Underwaters (NASUW) to Gulf Common Waters (GCW) inside mesoscale anticyclonic eddies during winter, (ii) enhancements of chlorophyll-a concentration during Northern wind events, (iii) the lateral diffusion of the anticyclonic eddies' heat and salt content, (iv) fine-vertical-scale intrusions of temperature and salinity at the periphery of anticyclonic eddies, and (v) submesoscale structures of about 30km scale such as anticyclonic/cyclonic intra-thermocline eddies.

Brief biography

Enric Pallàs-Sanz (Mexican PI), PhD, 44 years, research scientist at Centro de Investigación Científica y Educación Superior de Ensenada (CICESE), has been working the last 12 years on topics related to mesoscale vertical velocity of balanced vortical flows (eddies and fronts), unbalanced flows (near-inertia gravity waves), and wave-mean flow interactions. He has made significant contributions on developing and implementing a generalized version of the omega equation to diagnose mesoscale vertical velocity from density and horizontal velocity data. Since 2016 he is leading the Group of Monitoring the Ocean with Gliders (GMOG) who's mission is to monitoring, at high-resolution, the vertical, thermohaline and kinematic, structure of the Loop Current Eddies (LCEs) in the Gulf of Mexico (<https://gliders.cicese.mx>). His recent publications have provided new insights on frontal and vortex dynamics using different platforms of observation, namely, Seasoar, mooring, and glider data. Using mooring data from the Donnut Hole area in the Loop Current System, he has recently published two papers regarding the near-inertial response of the ocean to the passage of hurricanes over the Loop Current. He is co-author of 10 publications (2018-2021) on the structure and dynamics of mesoscale eddies from basin scale (heat and salt content) to small scale (layering), the water mass distribution and transformation within the eddies; and the deep circulation in the Gulf of Mexico using observations (gliders and moorings) and numerical modeling. Member of Mexico's 'Sistema Nacional de Investigadores' (SNI) with level I. Professor at the Postgraduate school at CICESE teaching Data Analysis in Oceanography and associate professor in the Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada of the Instituto Politécnico Nacional.

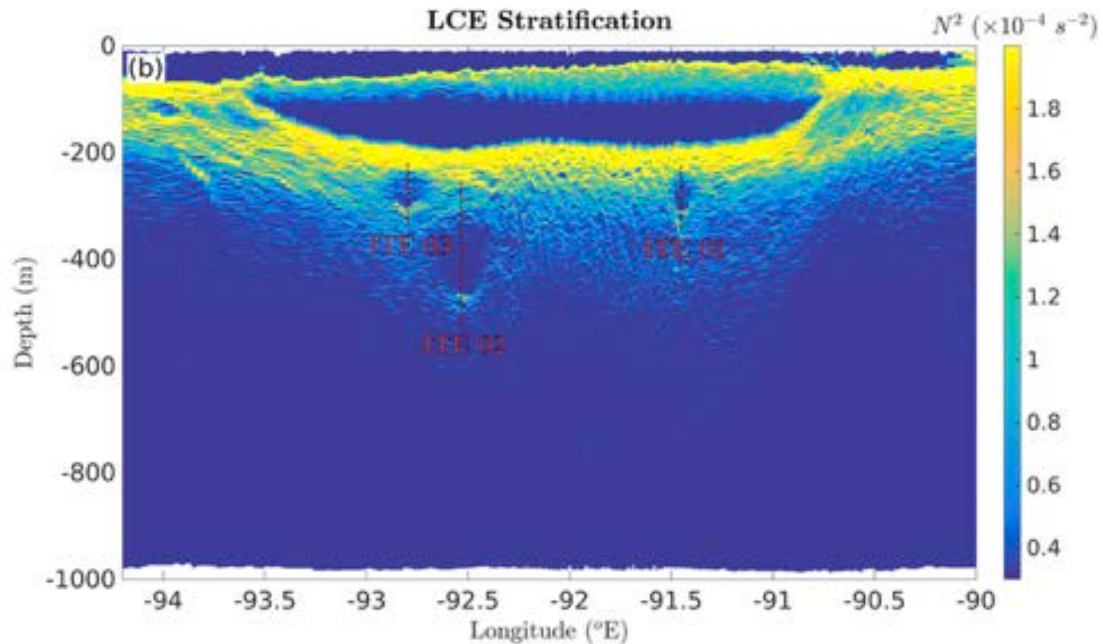


Figure 1. Vertical section of squared Brunt Vaisala (N^2) across a mesoscale anticyclonic gyre. Smaller-scale Intrathermocline Eddies (ITEs) are marked with a red vertical line. They appear as bubbles of weak stratification embedded within the LCE's well stratified lower pycnocline below the eddy core. Extracted from Meunier et al. (2018).

References

- Sosa-Gutiérrez, R., E. Pallàs-Sanz, J. Jouanno, A. Chaigneau, J. Candela, and M. Tenreiro (2020): Erosion of the subsurface salinity maximum of the Loop Current eddies from glider observations and numerical modeling. *J. Geophys. Res.*, 125.
- Meunier, T., J. Sheinbaum, E. Pallàs-Sanz, M. Tenreiro, J. Ochoa, A. Ruíz-Angulo, X. Carton, and Ch. de Marez, 2019: Heat Content and Decay of Warm-core Rings: the Case of the Gulf of Mexico. *Geophys. Res. Lett.*, 47.
- Portela, E., Tenreiro, M., Pallàs-Sanz, E., Meunier, T., Ruiz-Angulo, A., Sosa-Gutiérrez, R., & Cusí, S. (2018). Hydrography of the central and western Gulf of Mexico. *Journal of Geophysical Research: Oceans*, 123.
- Meunier, T., Pallàs-Sanz, E., Tenreiro, M., Portela, E., Ochoa, J., Ruiz-Angulo, A., & Cusí, S. (2018). The Vertical Structure of a Loop Current Eddy. *J. Geophys. Res.: Oceans*, 123, 6070–6090.

Link to the talk

<https://youtu.be/r9DrvZImCLs>