CV Date	28/01/2026

Part A. PERSONAL INFORMATION

First Name	Miguel		
Family Name	Gil Coto		
Sex	Not Specified	Date of Birth	
ID number Social Security, Passport			
URL Web			
Email Address			
Open Researcher and Contributor ID (ORCID)	0000-0003-3025-4258		

A.1. Current position

Job Title	Científico Titular		
Starting date	2009		
Institution	Consejo Superior de Investigaciones Científicas		
Department / Centre	Oceanografía / Instituto de Investigaciones Marinas		
Country		Phone Number	
Keywords	Oceanography		

A.2. Previous positions (Research Career breaks included)

Period	Job Title / Name of Employer / Country
2008 - 2009	Investigador Postdoctoral "Isidro Parga Pondal" / Instituto de Investigaciones Marinas / Spain
2006 - 2008	Research Associate / Flinders University / Australia
2005 - 2006	Investigador Postdoctoral "Isidro Parga Pondal" / Universidade de Vigo / Spain

A.3. Education

Degree/Master/PhD	University / Country	Year
Oceanografía y Geología de Costas	Universidade de Vigo	2004

Part B. CV SUMMARY

The CV focuses on physical oceanography using a multidisciplinary approach combining observations with inverse numerical methods and models. Since my PhD, I have combined field observations and models, seeking multidisciplinary applications across oceanographic scales. I translated inverse numerical methods from oceanic oceanography to estuarine studies, publishing the first worldwide paper introducing formal inverse techniques in estuarine box models. This enhanced our understanding of Coastal Upwelling's influence on Rías Baixas residual circulation. We demonstrated that Coastal Upwelling induces a three-dimensional structure in Ría de Vigo's residual circulation. Inverse methods were crucial for developing a new transformation of ADCP-registered velocities from radial to 3D oceanographic components, published in my first article as IIM-CSIC staff researcher.

My postdoctoral experience was based on observational techniques and direct numerical modeling applied to coastal processes. I spent 2 years working under the supervision of Prof. Mathias Tomczak (U. of Flinders, 2006), which involved the use of Oceanic Observing Systems and numerical models. As a staff researcher at IIM-CSIC, I continued to foster international research links through shorter stays: R. Vennell (U. of Otago, 2009), A. Valle-Levinson (U. of Florida, 2010), Á. Peliz (U. de Lisboa, 2014), J. Largier (U. of California Davies, 2015), A.J. Wuëst and D. Bouffard (EPFL, 2020), and L. Comeau and R. Filgueira (Dalhousie U., 2023). These contacts helped secure funding for “Plan Estatal” research projects (STRAMIX, STRAUSS) as IP or as a researcher (CALECO, REMEDIOS, CLIMANAGE, MAGIC) and to publish insightful articles in high-impact journals.

Several collaborative studies on CO2 fluxes, larval dispersion, physical-biological coupling, and cephalopod ecology have widened the multidisciplinary spectrum of the CV. At oceanic scales, and using inverse methods in two concurrent PhD theses (Pardo, P.C; Carracedo, L.), we improved the algorithms of water masses mixing, combining them with dynamical budgets. We obtained a better description of the circulation in the Gibraltar-Açores region and estimated the CO2 inventories in the Southern Ocean and North-East Atlantic. In the supervision of A. Velo's PhD thesis, we tuned multilinear and neural network interpolation algorithms applied to the carbon system to increase the quality of the oceanic carbon inventories. Both L. Carracedo and A. Velo have permanent positions (IFREMER and IIM-CSIC). P.C. Pardo keeps pushing hard for temporal postdoctoral contracts after her 5 years abroad at the CSIRO. During the last 12 years, I have supervised 2 final-year projects and 10 master's theses. Currently, I am co-supervising A. Martínez-Fernández, a former master's thesis student, as a part-time PhD candidate.

The studies on Coastal Upwelling in Rías Baixas and the oceanic ones provided a good opportunity to combine Coastal Upwelling and Global Change. Two highly cited articles were the result of this initiative and the international recognition that there was proof, at that time (2010-11), that Coastal Upwelling was weakening in Galicia. In 2017, I led the publication of the most significant article on this list, which demonstrated through wind and current observations that Costal Upwelling in Rías Baixas has a response time of 2-3 days vs the established 7-15 days. This response time matches the phytoplankton growth rate well, with profound consequences for the high primary production of the Rías Baixas, as we have shown in several papers. Besides, it increases the temporal scales at which Coastal Upwelling interacts with other forcing, such as the tidal modulation of turbulence or ocean wave induced drift, which we tackled in two other JGR papers.

Turbulence is a key topic in oceanography. During an oceanographic campaign studying Thin Layers of Phytoplankton, we found evidence of biomixing: small pelagic fishes creating efficient mixing in the water column through energetic swimming. First worldwide publication with observational evidence and awarded the Ig Nobel 2023 Physics Prize. The Ig Nobel provided national and international opportunities to increase our scientific work's outreach.

In the last 5 years, with IIM-CSIC and Canadian researchers, I have driven efforts to design and develop open hardware/software equipment to study bivalve mollusc behavior. We produced valvometry instrument prototypes for laboratory use and for mussel rafts. This research allowed us to correlate valve movements with bivalve responses to oceanographic conditions and connect them with aquaculture activities, a vital sector in Galicia's socioeconomy. These hardware and software developments built on our prior experience designing low-cost drifting buoys for the RADAR_ON_RAIA project, which validated velocity currents from Galicia's HF Radar system, a cornerstone for search and rescue operations.

Part C. RELEVANT ACCOMPLISHMENTS

C.1. Most important publications in national or international peer-reviewed journals, books and conferences

AC: corresponding author. (nº x / nº y): position / total authors. If applicable, indicate the number of citations

1 **Scientific paper**. (1/3) Gilcoto, M. (AC); Jones, Emlyn; Farina-Busto, Luis. 2009. Robust Estimations of Current Velocities with Four-Beam Broadband ADCPs. JOURNAL OF ATMOSPHERIC AND OCEANIC TECHNOLOGY. 26-12, pp.2642-2654. WOS (16) https://doi.org/10.1175/2009JTECHO674.1

2 **Scientific paper**. Babarro, J.M.F.; (2/8) Gilcoto, M.; Villacieros-Robineau, N.; Dios, S.; Costa, M.M.; Gestal, C.; Comeau, L.A.; Feiro, H.2024. The infaunal clam Polititapes rhomboides exposed to sediment mobilization and seawater warming: Recovery patterns and energetic constraints. Ecological Indicators. Elsevier. 150-111735, pp.1-15. WOS (0) https://doi.org/10.1016/j.ecolind.2024.111735

3 **Scientific paper**. (1/6) Gilcoto, M. (AC); Redondo-Caride, W.; Silva-Caride, E.; Comeau, L.A.; Filgueira, R.; Babarro, J.M.F.2023. Arduino controlled valvometry equipment for mussel raft monitoring. Instrumentation Viewpoint. SARTI. 22-ID21, pp.43-44.

4 **Scientific paper**. Broullón, E.; Franks, P.J.S.; Fernández-Castro, B.; (4/8) Gilcoto, M.; Fuentes-Lema, A.; Pérez-Lorenzo, M.; Fernández, E.; Mouriño-Carballido, B.2023. Rapid phytoplankton response to wind forcing influences productivity in upwelling bays. Limnology and Oceanography Letters. ASLO. 8-3, pp.529-537. WOS (10) https://doi.org/10.1002/lol2.10309

5 **Scientific paper**. Fernández Castro, B.; Peña, M.; Nogueira, E.; et al; Mouriño-Carballido, B.; (4/9) Gilcoto, M.2022. Intense upper ocean mixing due to large aggregations of spawning fish. Nature Geoscience. Springer Nature. 15-4, pp.287-292. WOS (12) https://doi.org/10.1038/s41561-022-00916-3

6 **Scientific paper**. (1/6) Gilcoto, M. (AC); Redondo-Caride, W.; Silva-Caride, E.; Comeau, L.A.; Filgueira, R.; Babarro, J.M.F.2021. Arduino controlled valvometry equipment for laboratory monitoring. Instrumentation Viewpoint. SARTI. 21-ID30, pp.60-61.

7 **Scientific paper**. Villacieros-Robineau, N.; (2/4) Gilcoto, M.; Pardo, P.C.; Barton, E.D.2021. Wave regime and wave-current coupling in an upwelling-driven bay: seasonal and inter-annual variability. Journal of Geophysical Research-Oceans. AGU. 126-C11, pp.1-25. WOS (7) https://doi.org/10.1029/2021JC017540

8 **Scientific paper**. Martínez-Fernández, A.; Redondo-Caride, W.; Alonso-Pérez, F.; et al; (11/11) Gilcoto, M.2021. SPOT and GPRS drifting buoys for HF Radar calibration. Instrumentation Viewpoint. SARTI. 21-ID22, pp.48-49.

9 **Scientific paper**. Fernández-Castro, B.; (2/6) Gilcoto, M.; Naveira-Garabato, A.C.; Villamaña, M.; Graña, R.; Mouriño-Carballido, B.2018. Modulation of the Semidiurnal Cycle of Turbulent Dissipation by Wind-Driven Upwelling in a Coastal Embayment. Journal of Geophysical Research-Oceans. 123-C06, pp.4034-4054. WOS (13) https://doi.org/10.1002/2017JC013582

10 **Scientific paper**. (1/9) Gilcoto, M. (AC); Largier, J. L.; Barton, E. D.; et al; de la Granda, F.2017. Rapid response to coastal upwelling in a semienclosed bay. Geophysical Research Letters. 44-5, pp.2388-2397. WOS (30) https://doi.org/10.1002/2016GL072416

11 **Scientific paper**. Carracedo, L. I.; (2/4) Gilcoto, M.; Mercier, H.; Perez, F. F.2014. Seasonal dynamics in the Azores-Gibraltar Strait region: A climatologically-based study. PROGRESS IN OCEANOGRAPHY. 122, pp.116-130. WOS (23) https://doi.org/10.1016/j.pocean.2013.12.005

12 **Scientific paper**. Velo, A.; Perez, F. F.; Tanhua, T.; (4/6) Gilcoto, M.; Rios, A. F.; Key, R. M.2013. Total alkalinity estimation using MLR and neural network techniques. JOURNAL OF MARINE SYSTEMS. 111, pp.11-18. WOS (40) https://doi.org/10.1016/j.jmarsys.2012.09.002

13 **Scientific paper**. Pardo, Paula C.; Perez, Fiz F.; Velo, Anton; (4/4) Gilcoto, Miguel. 2012. Water masses distribution in the Southern Ocean: Improvement of an extended OMP (eOMP) analysis. PROGRESS IN OCEANOGRAPHY. 103, pp.92-105. WOS (47) https://doi.org/10.1016/j.pocean.2012.06.002

14 **Scientific paper**. Pardo, Paula C.; Padin, Xose A.; (3/5) Gilcoto, Miguel; Farina-Busto, Luis; Perez, Fiz F.2011. Evolution of upwelling systems coupled to the long-term variability in sea surface temperature and Ekman transport. CLIMATE RESEARCH. 48-2-3, pp.231-246. WOS (100) https://doi.org/10.3354/cr00989

15 **Scientific paper**. Perez, Fiz F.; Padin, Xose A.; Pazos, Yolanda; (4/8) Gilcoto, Miguel; Cabanas, Manuel; Pardo, Paula C.; Dolores Doval, Ma; Farina-Busto, Luis. 2010. Plankton response to weakening of the Iberian coastal upwelling. GLOBAL CHANGE BIOLOGY. 16-4, pp.1258-1267. WOS (129) https://doi.org/10.1111/j.1365-2486.2009.02125.x

C.3. Research projects and contracts

1 **Project**. PID2023-151928OB-I00, CLIMANAGE: Herramientas para un cultivo de mejillón resiliente: interacciones entre alteraciones climáticas y nuevas tendencias de manejo. Ministerio de Ciencia, Innovación y Universidades. José Manuel Fernández Babarro. (Instituto de Investigaciones Marinas). 01/09/2024-31/12/2028. 223.750 €. Team member.

2 **Project**. PID2024-156623OB-C22, MAGIC: Modelling and Analysis of phytoplankton Growth in the rías: understanding productIvity and harmful algae Changes. Subproject 2.. Ministerio de Ciencia, Innovación y Universidades. Jesús M. Pedreira Dubert. (Instituto de Investigaciones Marinas). 01/12/2025-31/08/2028. 135.000 €. Team member.

3 **Project**. Monitorización en tiempo real del cultivo de mejillón en batea: herramientas para una gestión flexible y resiliente al Cambio Climático. Fundación Biodiversidad. Laura I. García Peteiro. (Consejo Superior de Investigaciones Científicas). 01/07/2024-31/12/2025. 87.862,92 €. Team member.

4 **Project**. PID2019-106008RB-C21, STRAUSS: Efectos del oleaje en el Sistema de Afloramiento de la Rías Baixas: dinámica superficial en casos de estudio biológicos específicos. Ministerio de Ciencia, Innovación y Universidades. Miguel Gil Coto. (Instituto de Investigaciones Marinas). 01/07/2020-28/02/2024. 267.410 €. Principal investigator.

5 **Project**. 820989, COMFORT: Our common future ocean in the Earth system – quantifying coupled cycles of carbon, oxygen, and nutrients for determining and achieving safe operating spaces with respect to tipping points (COMFORT). H2020-CLIMA/0514. Isabel Emma Huertas Cabilla. (Consejo Superior de Investigaciones Científicas). 01/09/2019-31/08/2023. 110.926 €. Team member.

6 **Project**. 0461_RADAR_ON_RAIA_1_E, RADAR ON RAIA: Radares en el observatorio RAIA. EU-Interreg. Miguel Gil Coto. (IIM-CSIC). 01/01/2018-31/12/2021. 95.197 €. Principal investigator.

7 **Project**. CTM2016-75451-C2-1-R, REMEDIOS: La importancia de los procesos de mezcla en el inicio, mantenimiento y declive de las floraciones de fitoplancton en las rías gallegas (REMEDIOS). Ministerio de Economía y Competitividad. Beatriz Mouriño Carballido. (Universidade de Vigo). 01/01/2017-31/12/2019. 168.000 €. Team member.

8 **Project**. IN607A 2016/11, Axudas para a consolidación e estructuración de unidades de investigación competitivas, Grupos de Referencia Competitiva. XUNTA DE GALICIA. Miguel Gil Coto. (IIM-CSIC). 01/01/2016-31/12/2019. Principal investigator.

9 **Project**. CTM2015-69519-R, CALECO: Demografía y relaciones tróficas de larvas de calamar en un área oceanográfica de afloramiento: hacia una aproximación ecosistémica para la gestión de este recurso. Ministerio de Economía y Competitividad. Ángel Francisco González González. (IIM-CSIC). 01/01/2016-31/12/2018. 199.650 €. Team member.

10 **Project**. CTM2012-35155, Estratificación y mezcla en un estuario forzado por afloramiento costero (STRAMIX). Ministerio de Economía y Competitividad. Miguel Gil Coto. (Instituto de Investigaciones Marinas). 01/01/2013-31/12/2015. 105.000 €. Principal investigator.

11 **Contract**. Centimer25: Investigación para utilizar el mejillón como organismo "centinela" de indicador de BEA, que recoja los impactos que el estresor ruido antropogénico genera sobre la fauna marina Mensoft Consultores S.L.. José Manuel Fernández Babarro. 01/03/2025-01/01/2026. 40.706,82 €.

12 **Contract**. Plan de Recuperación, Transformación y Resiliencia. OCEANS+ Ciencias oceánicas en el desarrollo de las estrategias marinas+ herramientas de gestión. Eje 3 Modelización de impactos de cambio climático - IIM (ESM2023-03-002) Ministerio para Transición Ecologíca y el Reto Demográfico. Miguel Gil Coto. (Ministerio para Transición Ecologíca y el Reto Demográfico). 01/01/2023-01/01/2026. 158.686 €.

13 **Contract**. Plan complementario de I+D+i- Plan de Recuperación, Transformación y Resiliencia - Ciencias Marinas - Galicia. Modelo bio-físico numérico de dispersión larval de moluscos bivalvos nas augas galegas (ACAM 2022020038) Xunta de Galicia. Miguel Gil Coto. (IIM-CSIC). 01/10/2022-01/09/2025. 92.000 €.

14 **Contract**. Protocolo de seguimiento de bancos de ameixa rubia (Venerupis rhomboides) na Ría de Vigo Centro de Investigacións Mariñas (CIMA). Fernando Febrero Mayor. 01/07/2019-30/11/2021. 47.090 €.