

# PABLO ALMARAZ, PHD.

I am a quantitative theoretical ecologist and applied mathematician working in the mathematical and statistical analysis of biological data from natural ecosystems. My research strategy is focused in developing methods for robustly teasing apart the effects of ecological interactions from abiotic effects and sampling variance in population and community analyses. My ultimate goal is to understand the persistence of high-dimensional biological ensembles in fluctuating environments.

## EDUCATION

- 2023  
|  
2017
- **PhD., Marine Sciences and Technology**  
Cádiz, SP 📍 CSIC – UCA
    - Diversity, variability and persistence: elements for a non-equilibrium theory of eco-evolutionary dynamics
    - Download full PhD thesis [here](#)
- 2017  
|  
2016
- **M.Sc., Mathematics**  
Cádiz, SP 📍 UCA
    - Liapunov and structural stability in inverse evolution problems
- 2016  
|  
2012
- **B.Sc., Marine Sciences, Oceanography**  
Cádiz, SP 📍 UCA
    - Global pattern of diversity and stability in marine phytoplankton communities

## RESEARCH EXPERIENCE

- Today  
|  
2023
- **Postdoctoral researcher**  
Cádiz, SP 📍 Instituto de Ciencias Marinas de Andalucía, CSIC
    - Remote sensing approaches to spatio-temporal modeling of primary production in Iberian sea
    - Applied mathematician
- 2022
- **Predoctoral researcher**  
Sevilla, SP 📍 Universidad de Sevilla
    - Complexity and dynamic systems: mathematical theory and applications to ecology and the neuroscience of consciousness
    - Applied mathematician

## CONTACT

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- 🌐 [github.com/palmaraz](https://github.com/palmaraz)
- 🌐 [palmaraz.github.io](https://palmaraz.github.io)
- 🐦 [@palmaraz\\_Eco](https://twitter.com/palmaraz_Eco)
- ☎ +34 956 832 612 Ext. 255

## SKILLS

Experienced in

LaTeX  
R  
Python  
Mathematica  
Matlab

Last updated on 2023-10-12.

I have reviewed more than 60 papers for 18 journals: Biological conservation. (1), Bird study. (2), Climate Research (7), Ecography. (1), Ecological modelling. (2), Ecology letters. (15), Ecology. (1), Environmental and ecological statistics. (3), European journal of wildlife research. (2), Frontiers in ecology and evolution. (5), Hydrobiologia. (1), Ibis. (5), Internationale Revue der gesamten Hydrobiologie und Hydrographie (1), Journal of animal ecology. (3), Journal of applied ecology. (1), Marine ecology. (1), Oecologia. (3), Theoretical and applied climatology. (6)

- 2022  
|  
2017

● **Pre-doctoral researcher**  
Cádiz, SP 📍 Instituto de Ciencias Marinas de Andalucía, CSIC

  - Diversity, variability and persistence: elements for a non-equilibrium theory of eco-evolutionary dynamics
  - FPU
  
- 2017

● **Researcher**  
Cádiz, SP 📍 Instituto de Ciencias Marinas de Andalucía, CSIC

  - Effect of the permeabilization of the marshes of the Doñana National Park on the trophic structure of its aquatic ecosystems
  
- 2017  
|  
2016

● **Researcher**  
Cádiz, SP 📍 Instituto de Ciencias Marinas de Andalucía, CSIC

  - Detection of jellyfish in the Balearic Sea and its relationship with environmental conditions: towards the development of a pre-operational prediction system
  
- 2011  
|  
2010

● **Researcher**  
Madrid, SP 📍 Museo Nacional de Ciencias Naturales, CSIC

  - Scavenging ecology
  
- 2010

● **Researcher**  
Elche, SP 📍 Universidad Miguel Hernández

  - Studies on population trends of the Gray Teal (*Marmanonetta angustirostris*) and the Duck (*Oxyura leucocephala*) in the Hondo Natural Park
  
- 2010  
|  
2007

● **Researcher**  
Granada, SP 📍 Estación Experimental del Zaidín, CSIC

  - Isotopic fingerprints of Global Change in Andalusia P06-RNM-02362
  
- 2007  
|  
2004

● **Researcher**  
Sevilla, SP 📍 Estación Biológica de Doñana, CSIC

  - The restoration ecology of fauna and flora on the Caracoles farm: structure of the bird community and its role in the dispersal of plants and other animals RNM 2431
  
- 2006  
|  
2003

● **Researcher**  
Sevilla, SP 📍 Estación Biológica de Doñana, CSIC

  - Reconstruction of population fluctuations of Doñana birds over the last three decades
  
- 2005  
|  
2003

● **Researcher**  
Granada, SP 📍 Universidad de Granada

  - Floral evolution in *Erysimum mediohispanicum*: an integrated study of microevolutionary processes, genetic architecture and interspecific variation (BOS-2003-01095)

2004  
|  
2002



### Researcher

Granada, SP

📍 Universidad de Granada

- Conflicts between selection imposed by pollinators and selection imposed by herbivores in *Erysimum mediohispanicum* (Cruciferae): consequences for floral specialization (URO2-001)

2002



### Researcher

Granada, SP

📍 Universidad de Granada

- Spatio-temporal Ecology of the Globally Endangered White-headed Duck (*Oxyura leucocephala*) in Spain: Growth, Limitation and Regulation of a Natural Population



## TEACHING EXPERIENCE

2020  
|  
2019



### Degree in Marine Sciences

Cádiz, SP

📍 Universidad de Cádiz

- Biological Oceanography

2020  
|  
2019



### Degree in Marine Sciences

Cádiz, SP

📍 Universidad de Cádiz

- Marine Ecology



## PEER-REVIEWED PUBLICATIONS

2022



### [Structural stability of invasion graphs for generalized Lotka–Volterra systems](#)

arXiv, 2209.09802, 1-28

- Almaraz P, Langa JA, Kalita P

2022



### [Long-term demographic dynamics of a keystone scavenger disrupted by human-induced shifts in food availability](#)

Ecological Applications, 32,

- Almaraz P, Martínez F, Morales-Reyes Z, Sánchez-Zapata JA, Blanco G

2017



### [Reproduction of Spatio-Temporal Patterns of Major Mediterranean Phytoplankton Groups from Remote Sensing OC-CCI Data](#)

Frontiers in Marine Science, 4, 246

- Navarro G, Almaraz P, Caballero I, Vázquez Á, Huertas IE

- 2016 ● **From the individual to the landscape and back: time-varying effects of climate and herbivory on tree sapling growth at distribution limits**  
Journal of Ecology, 104, 430-442  
· Herrero A,Almaraz P,Zamora R,Castro J,Hódar JA
- 2015 ● **Bordeaux wine quality and climate fluctuations during the last century: changing temperatures and changing industry**  
Climate Research, 64, 187-199  
· Almaraz P
- 2014 ● **Simple models, complex models, useful models: can we tell them from the flap of a butterfly's wings?**  
Frontiers in Ecology and Evolution, 2, 54  
· Almaraz P
- 2014 ● **Plasma biochemistry and haematology of crested coots (*Fulica cristata*) and common coots (*Fulica atra*) from Spain**  
Comparative Clinical Pathology, 23, 385-391  
· Rubio MD,Ildefonso N,Agüera EI,Almaraz P,De Miguel RJ,Escribano BM
- 2013 ● **Inferring ecological mechanisms from hunting bag data in wildlife management: a reply to Blanco-Aguilar et al. (2012)**  
European Journal of Wildlife Research, 59, 599-608  
· Moleón M,Almaraz P,Sánchez-Zapata JA
- 2012 ● **Estimating partial observability and nonlinear climate effects on stochastic community dynamics of migratory waterfowl**  
Journal of Animal Ecology, 81, 1113-1125  
· Almaraz P,Green AJ,Aguilera E,Rendón MA,Bustamante J
- 2011 ● **Size-mediated non-trophic interactions and stochastic predation drive assembly and dynamics in a seabird community**  
Ecology, 92, 1948-1958  
· Almaraz P,Oro D
- 2011 ● **Spatial Heterogeneity in Resource Distribution Promotes Facultative Sociality in Two Trans-Saharan Migratory Birds**  
PLoS ONE, 6, e21016  
· Cortés-Avizanda A,Almaraz P,Carrete M,Sánchez-Zapata JA,Delgado A,Hiraldó F,Donázar JA
- 2008 ● **An Emerging Infectious Disease Triggering Large-Scale Hyperpredation**  
PLoS ONE, 3, e2307  
· Moleón M,Almaraz P,Sánchez-Zapata JA

- 2008 ● **Status, distribution and long-term changes in the waterbird community wintering in Doñana, south-west Spain**  
Biological Conservation, 141, 1371-1388  
· Rendón MA,Green AJ,Aguilera E,Almaraz P
- 2005 ● **Ecological time-series analysis through structural modelling with latent constructs: concepts, methods and applications**  
Comptes Rendus Biologies, 328, 301-316  
· Almaraz P
- 2004 ● **Complex structural effects of two hemispheric climatic oscillators on the regional spatio-temporal expansion of a threatened bird**  
Ecology Letters, 7, 547-556  
· Almaraz P,Amat JA
- 2004 ● **Multi-annual spatial and numeric dynamics of the white-headed duck *Oxyura leucocephala* in southern Europe: seasonality, density dependence and climatic variability**  
Journal of Animal Ecology, 73, 1013-1023  
· Almaraz P,Amat JA
- 2001 ● **Competition with carps may limit White-headed duck populations in Spain**  
TWSG News, 13, 31-32  
· Almaraz P
- 2000 ● **Historia natural de la Malvasía Cabeciblanca *Oxyura leucocephala* G. en el complejo endorreico de El Puerto de Santa María (Cádiz , SO de España ) durante un período de 12 años: una revisión**  
Oxyura, 10, 53-67  
· Almaraz P



## BOOKS

- 2020 ● **CALYPSO 2019 Cruise Report: field campaign in the Mediterranean**  
Woods Hole Oceanographic Institution, Woods Hole, MA  
· Mahadevan A,D'Asaro EA,Allen JT,Almaraz et al.
- 2009 ● **Ànec cuallarg *Anas acuta***  
Atles dels ocells de Catalunya a l'hivern 2006-2009, Lynx edicions, Barcelona  
· Almaraz P,Ferrer X

I have a total of 635 cites for my published work, an h-index of 11, and a i10-index of 12.

2009



**Xibec Netta rufina**

Atles dels ocells de Catalunya a l'hivern 2006-2009, Lynx edicions, Barcelona

· Ferrer X, Almaraz P



**CONFERENCES**

2021



**Bayes and the tangled web: how to identify species interactions using abundance time series**

XV Congreso Nacional de la AEET, Plasencia, Extremadura, Spain

· Almaraz, P

2020



**Life-history correlates of coexistence and stability in natural competitive communities: a missing eco-evolutionary link?**

VII Biennial Congress of the Spanish Society for Evolutionary Biology, Sevilla, Spain

· Almaraz, P., Godoy, O., Ruiz, J.T.

2019



**Long-term demographic dynamics of a keystone scavenger destabilized by human-induced shifts in food availability**

XXIV Congreso Español y VII Ibérico de ornitología, Cádiz, Andalusia, Spain

· Almaraz P, Martínez F, Morales-Reyes Z, Sánchez-Zapata JA, Blanco G

2019



**Species interaction network and climate impacts on the persistence and stability of world bird communities**

XXIV Congreso Español y VII Ibérico de ornitología, Cádiz, Andalusia, Spain

· Almaraz, P

2019



**Ecological interactions, stochastic structural stability and the storage effect in fluctuating environments**

1st Meeting of the Iberian Ecological Society & XIV AEET Meeting, Barcelona, Spain

· Almaraz, P., Navarro, G., Cózar, A.

2006



**Common numeric trends of waterfowl populations in response to external and internal factors: the case of Delta de L'Ebre (NE Spain)**

XIVth Nordik Congress of Wildlife Research, Fuglsø, Denmark

· Almaraz, P., Ferrer, X., Martinez-Villalta, A.

- 2006 ● **Exploring the density-dependent structure of waterfowl populations: new methods and evidence**  
XIVth Nordik Congress of Wildlife Research, Fuglsø, Denmark  
· Almaraz P, Green AJ, Aguilera E, Rendón MA
- 2006 ● **Transient climatic teleconnections translate to recruitment regime shifts in the Spanish population of White-headed duck (*Oxyura leucocephala*)**  
XIVth Nordik Congress of Wildlife Research, Fuglsø, Denmark  
· Almaraz P, Amat JA
- 2006 ● **Wintering duck populations in Doñana: a review of status, trends and spatial patterns**  
XIVth Nordik Congress of Wildlife Research, Fuglsø, Denmark  
· Almaraz P, Green AJ, Aguilera E, Rendón MA
- 2005 ● **Population models in wader ecology: theory and data**  
Annual Conference of the International Wader Study Group, Cork, Ireland  
· Almaraz, P
- 2003 ● **Covariation between long-term population variability, dynamic complexity and life-history traits in waders: A multi-species analysis**  
Annual conference of the International Wader Study Group, Cádiz, Spain  
· Almaraz, P
- 2003 ● **Herbivorismo, polinización y dinámica demográfica de una planta monográfica perenne**  
VII Congreso Nacional de la Asociación Española de Ecología Terrestre, Barcelona, Spain  
· Almaraz, P., Gómez, J.M.
- 2003 ● **The roles of error structure specification, parameter minimization and uncertainty estimation on model assessment: an information-theoretic approach with two endangered vertebrate species**  
Alcalá II International Conference on Mathematical Ecology, Alcalá de Henares, Spain  
· Almaraz P, Amat JA

2003

- **Using structural modeling to unravel complex interactions between climatic oscillators, endogenous signals and stochastic noise in population dynamics**

Alcalá II International Conference on Mathematical Ecology, Alcalá de Henares, Spain

· Almaraz, P



## SELECTED PRESS (ABOUT)

2017

- **[OndaCadiz Radio Interview](#)**

OndaCadiz

· Almaraz, P



## SELECTED PRESS (BY)

2018

- **[La estabilidad de los ecosistemas en un mundo cambiante](#)**

eldiario.es

· Almaraz, P

2018

- **[¿Pueden los mercados financieros predecir la dinámica del fitoplancton marino?](#)**

conec.uv.es

· Almaraz, P

2004

- **[El fenómeno de El Niño está tras el aumento de malvasía cabeciblanca](#)**

Quercus, 225, 10-11

· Almaraz P, Amat JA