

✉ 9719 Regent Street, Apt. 6
90034 Los Angeles CA

@ adelpech@atmos.ucla.edu

☎ +33 7 82 55 55 25

Audrey Delpech

Post-doctoral Researcher
Physical Oceanography
University of California at Los Angeles

Formations

- Nov. 2017-
Feb. 2021** **PhD Laboratoire d'Etudes Géophysiques et d'Océanographie Spatiale (LEGOS), Toulouse**
Deep circulation at low latitudes in the ocean from in-situ observations, numerical simulations and fundamental theories, involving waves propagation, destabilization and non-linear processes. Mentors: Dr. Yves MOREL, Sophie CRAVATTE and Frédéric MARIN.
- 2016-2017** **International Master WAPE – Ecole Polytechnique - Sorbonne Université, Paris**
2nd year M.Sc. – WAPE: Water, Air, Pollution and Energy at local and regional scales. Theoretical courses on climate, oceanography, meteorology, physics, renewable energies, modeling and economics – *highest honors, ranked first*.
- 2016** **Norwegian University for Sciences and Technologies (NTNU), Trondheim (Norway)**
M.Sc. lectures – Atmospheric Physics and Climate change.
- 2013-2015** **Ecole Nationale Supérieure de Techniques Avancées (ENSTA), Institut Polytechnique de Paris, Paris (French Grande Ecole)**
1st year M.Sc. – Fluid Mechanics and Environmental Physics.
3rd year B.Sc. – In-depth lectures in applied mathematics and physics with additional lectures in economics, culture and languages.
- Before
2013** **Baccalauréat (2011) Scientific Section – highest honors ; Classes Préparatoires aux Grandes Ecoles (2011-2013) – Intensive courses in Mathematics, Physics and Algorithmic.**

Experiences

- Since Mar.
2021** **Postdoctoral Researcher – University of California at Los Angeles, UCLA (USA)**
Internal waves dynamics and their interaction with meso- and submesoscale eddies in regional realistic simulations of the California Current.
Mentors: Pr. James McWILLIAMS (UCLA), Pr. Roy BARKAN (Tel Aviv University, Israel).
- 2020** **« Visiting Student Researcher » – Stanford University (USA)**
Equatorial waves generation, propagation and non-linear interactions in the deep ocean.
Mentor: Pr. Leif THOMAS.
- Nov. 2017-
Dec. 2019** **Consultant – Collecte Localisation Satellite (CLS), Toulouse**
Expertise missions in the « sustainable fisheries » team at CLS, modelling of marine ecosystems in the AtlantOS project framework (15% of PhD working time).
- 2017
Apr. -Oct.** **Research Intern – Collecte Localisation Satellite (CLS), Toulouse**
Design and optimization of an acoustic observation network for micronekton in the framework of data assimilation for a dynamic population model as part of the European project H2020 AtlantOS (Atlantic Observing System). – Mentor: Dr. Patrick LEHODEY.
- 2015
Sep. -Dec.** **Research Intern – Center for Atmospheric and Oceanic Sciences, Hamburg (Germany)**
Chaotic stirring and mixing in geostrophic turbulence. Ocean modeling and particles dispersion using Lyapunov exponents and advanced statistics. – Mentor: Pr. Gualtiero BADIN.
- 2015
May-Jul.** **Research Intern – The Cyprus Institute (CyI), Nicosia (Cyprus)**
Study of the impact of the oceanic circulation on the dynamics of the ecosystems in the Levantine basin. Statistical analysis (empirical orthogonal functions) of satellite and in-situ data as part of the European project PERSEUS (Policy Oriented Research for the Southern European Seas).
Mentors: Pr. Carlos JIMENEZ, Rana ABU-ALHAIJA (CyI), Pr. Lars STEMANN (Marine Zoological Station, Villefranche-Sur-Mer).

Field Work

2017 MOOSE (Mediterranean Observing System on the Environment). Oceanographic Survey in the Gulf of Lion – 15 days, R/V L'Atalante

2022 S-MODE (Sub-Mesoscale Ocean Dynamics Experiment). Oceanographic Survey in the California Current – 1 month, R/V Bold Horizon.

Synergistic Activities

Organization of colloquiums

Chair of a scientific session for the « Ocean Sciences » 2022 conference.

Organization of a summer school « Ocean, Atmosphere and Climate » at the Ecole de physique des Houches (July 2021).

Mentoring

Co-Mentoring of 3 Master Internships at Ifremer (France) and Cotonou University (Benin)

Review Activities

Reviewer for International Journals: *Ocean Dynamics*, *Geophysical Research Letter*, *Journal of Physical Oceanography*, and *Frontiers in marine biology*.

Collective Interest Mission

Member of the Seminar organization team at the LEGOS

Member of the « Greenhouse Gases Budget » team at the LEGOS to estimate the carbon footprint of the research activity in the Lab.

Languages

French, English, German (Fluent). Spanish (Intermediate).

Skills

High-performance computing and analyses (Python, Matlab, R, Fortran, shell)

Experience with in-situ data analysis (ADCP, CTD, Argo floats) and satellite data analysis.

Experience with scientific research models (CROCO, ROMS, SEAPODYM), including variational data assimilation modules.

Qualification “Maitre de Conference” (equivalent to Assistant Professor in the US) since 2022.

Awards

2022 « Prix Prud'homme », Best PhD thesis award, French Meteorological Society.

2020 Stanford Visiting Student Researcher Fellowship Award. Recipient of one of the four annual fellowships awarded by the France-Stanford Center for Interdisciplinary Studies.

2019 EGU Outstanding Student Presentation Award.

Publications

1. **Delpech, A.**, Ménesguen, C., Morel, Y., Thomas, L., Marin, F., Cravatte, S., Le Gentil, S. Intra- annual waves destabilization as a potential driver of the deep low-latitude zonal jets - Baroclinic dynamics, **in prep.**
2. **Delpech, A.**, Barkan, R., McWilliams, J., Srinivasan, K., Siyanbola, O., Buijsman, M., Arbic, B. Eddy-Internal Wave interaction processes and their contribution to the energy cascade in the California Current, **in prep.**
3. **Delpech, A.**, Barkan, R., Renault, L., McWilliams, J., Siyanbola, O., Buijsman, M., Arbic, B. Wind-current feedback at high frequency is an energy sink for oceanic internal waves. *Submitted to Scientific Report.*
4. Siyanbola, O., Buijsman M., **Delpech, A.**, Renault, L., Barkan, R., Shriver, J., Arbic, B., McWilliams, J. et al. (2022). Remote internal wave forcing of regional ocean simulations near the U.S. West Coast. *Ocean Modelling*, p. 102154. <https://doi.org/10.1016/j.ocemod.2022.102154>
5. **Delpech, A.**, Ménesguen, C., Morel, Y., Thomas, L., Marin, F., Cravatte, S., Le Gentil, S. (2021). Intra-annual waves destabilization as a potential driver of the deep low-latitude zonal jets - Barotropic dynamics. *Journal of Physical Oceanography*, 51(2): 365-384. <https://doi.org/10.1175/JPO-D-20-0180>
6. Assene, F., Morel, Y., **Delpech, A.**, Aguedjou, M. et al. (2020). From Mixing to the Large Scale Circulation: How the Inverse Cascade Is Involved in the Formation of the Subsurface Currents in the Gulf of Guinea. *Fluids*, 5, 147. <https://doi.org/10.3390/fluids5030147>
7. **Delpech, A.**, Cravatte, S., Marin, F., Morel, Y., Ménesguen, C. (2020). Deep Eddy Kinetic Energy in the tropical Pacific from Lagrangian floats. *Journal of Geophysical Research: Oceans*, 125, e2020JC016313. <https://doi.org/10.1029/2020JC016313>
8. **Delpech, A.**, Conchon, A., Titaud, O., Lehodey, P. (2020). Influence of oceanic conditions in the energy transfer efficiency estimation of a micronekton model, *Biogeosciences*, 17, 833–850. <https://doi.org/10.5194/bg-2019-353>
9. **Delpech, A.**, Cravatte, S., Marin, F., Morel, Y., Gronchi, E., Kestenare, E. (2020) Observed tracer fields structuration by mid-depth zonal jets in the tropical Pacific. *Journal of Physical Oceanography*, 50(2), 281–304. <https://doi.org/10.1175/JPO-D-19-0132.1>
10. Ménesguen, C., **Delpech, A.**, Marin, F., Cravatte, S., Schopp, R., Morel, Y. (2019). Observations and mechanisms for the formation of deep equatorial and tropical circulation. *Earth and Space Science*, 6, 370– 386. <https://doi.org/10.1029/2018EA000438>
11. Lehodey, P., Titaud, O., **Delpech, A.**, Conchon, A. (2018). Optimal design of ecosystem module. *AtlantOS D5.5*, 29 pp. https://doi.org/10.3289/atlantos_d5.5

Presentations

1. **Euro-Argo Workshop**
Brussels (Belgium), October 2022
“Deep Eddy Kinetic Energy Spectrum in the tropical Pacific revealed by Argo floats” (talk).
2. **FilaChange SWOT-CLIVAR workshop**
Paris (France), August 2022
“Cross-scale energy transfer in the California Current” (talk).
3. **SWOT Science Team Meeting**,
June 2022
“Wind-Current feedback at high frequency: an energy sink for internal waves” (talk).
4. **Ocean Mixing Gordon Research conference**
Springfield (MA, USA), June 2022
“Internal waves dynamics in the California Current” (poster).

5. **Winds and Currents webinar**
May 2022
“Internal Waves interactions with the atmosphere from a high-resolution simulation of the California Current” (invited talk).
6. **Ocean Sciences Meeting**
February 2022
“Eddy-Internal waves interactions in the California Current System” (talk).
7. **Ocean Circulation and Climate Dynamics Colloquium**
GEOMAR, Kiel (Germany), December 2021
“The dynamics and effect of deep jets at low latitudes in the ocean” (invited talk).
8. **LEGOS Seminar**
Toulouse (France), June 2020
“Deep Eddy Kinetic Energy content in the tropical Pacific inferred from Argo Floats” (talk).
9. **European Geophysical Union**
May 2020
“The intra-annual variability, as a potential driver of the mean deep ocean circulation at low-latitudes” (talk).
10. **Ocean Sciences Meeting**
San Diego (CA, USA), February 2020
“Transport and mixing from observed tracer structures in the deep tropical Pacific” (poster).
11. **Physics at the Equator: from the Lab to the Stars International Workshop**
Lyon (France), October 2019
“Understanding the low-latitude jet-structured deep ocean circulation: Insight from idealized numerical simulations” (poster).
12. **CASSIOPEE cruise Workshop**
Oldenburg (Germany), June 2019
“Hydrological observations and physical implications (Part II: Mixing and Jet sharpening)” (talk).
13. **European Geophysical Union (EGU)**
Vienna (Austria), April 2019
“Deep circulation in the tropical Pacific Ocean from in-situ observations” (PICO).
14. **AtlantOS international Symposium**
Paris (France), March 2019
“Optimal regional sampling design for ocean ecosystem models using OSSEs” (poster).
15. **CASSIOPEE cruise Workshop**
Toulouse (France), November 2018
“Hydrological observations and physical implications (Part I: Deep oxygen supply to the Eastern Pacific Oxygen Minimum Zone)” (talk).
16. **British Antarctic Survey Seminar**
Cambridge (UK), September 2018.
“Network design optimization for micronekton” (invited talk)

Outreach

“Dévoilement de l'énergie de l'océan profond” scientific news article - Institut de Recherche pour le Développement.
<https://www.ird.fr/devoilement-de-lenergie-profonde-de-locean>

Conference “Role of terrestrial and extra-terrestrial oceans in the habitability of Planets”. With N. André, researcher at the Institute of Astrophysics of Toulouse (Pint of Science 2019, Toulouse).

Conference “Ocean circulation and its role in the climate regulation: the example of el Niño” (Fête de la Science 2018, Toulouse).