

## Carlos F. Moffat

Assistant Professor, Physical Oceanography

Department of Oceanography  
University of Concepción  
Casilla 160-C, Concepción, Chile

*E-mail:* cmoffat@udec.cl  
*Tel (Chile):* +56 (41) 266-1028  
*Tel (USA):* +1 (508) 503-1938

---

### EDUCATION

#### **MIT/WHOI Joint Program in Oceanography**, Woods Hole, MA

Doctor of Philosophy, Physical Oceanography, 2007

Thesis: Ocean Circulation and Dynamics on the west Antarctic Peninsula Continental Shelf

Advisors: Robert C. Beardsley and Breck Owens

#### **University of Concepción**, Concepción, Chile

Bachelor of Science, Marine Biology, 1998

Thesis: Distribución de biomasa y metabolismo por tamaño en un sistema hipereutrífico: Laguna Rocuant, Talcahuano

Advisors: Renato Quiñones and Víctor Dellarossa

### RESEARCH INTERESTS

Coastal physical oceanography, including flow/topography interactions, buoyancy-driven circulation, physical-biological interactions, shelf-open ocean exchange processes and the impact of climate change on coastal systems.

### PROFESSIONAL EXPERIENCE

#### **2009-present** University of Concepción, Chile

Assistant Professor

Currently studying the response of coastal buoyant fronts to wind forcing and the influence of this forcing on the exchange of organisms and chemical tracers across coastal fronts using the Regional Ocean Modeling System (ROMS).

#### **2009-present** Woods Hole Oceanographic Institution, Woods Hole, MA

Adjunct Scientist

Participating in the VOCALS project (VAMOS Ocean-Cloud-Atmosphere-Land Study), in collaboration with Fiamma Straneo and Robert Weller to investigate the structure of ocean eddies and their role in the heat budget of the ocean off the Chilean coast.

#### **2007-2008** Woods Hole Oceanographic Institution, Woods Hole, MA

Postdoctoral Investigator

Pursued research using a variety of satellite-, moored- and shipboard-based observations to elucidate the scales and processes involved in the advection of cold-water anomalies from the coastal upwelling region to the permanent cloud-covered region off the coast of Arica, Chile.

#### **2001-2007** MIT/WHOI Joint Program, Woods Hole, MA

Graduate Researcher

Used the Southern Ocean GLOBEC (a large, multidisciplinary international research program), dataset from the western Antarctic Peninsula region to characterize the forcing and circulation of the shelf waters. In conjunction with analytical and numerical models, investigated intrusions of oceanic waters onto the shelf through a submarine trough, the dynamics of a wind-forced surface buoyant plume, and the processes setting the observed hydrographic structure.

#### **1999-2000** University of Concepción, Department of Oceanography, Concepción, Chile

Graduate Researcher

Described sites of enhanced coastal upwelling along the Chilean coast, using an analytical, two-layer vorticity model of the coastal ocean combined with large scale wind and geographical information.

**1997-1998** University of Concepción, Department of Oceanography, Concepción, Chile  
Undergraduate Researcher  
Investigated the size-spectra distribution of biomass and metabolic rates and their relationship to primary productivity of an hyper-eutrophic lagoon in Talcahuano, Chile, using enzyme-activity measurement techniques, ATP-based biomass estimations and primary productivity experiments.

FELLOWSHIPS AND AWARDS    **2005-2006** WHOI Cooperative Institute for Climate and Ocean Research Fellowship  
**2004-2005** WHOI Coastal Ocean Institute Fellowship  
**2001-2004** Presidential Fellowship (Chile)  
**1999** CONAMA prize for best Marine Ecology student  
**1999** Best Student Prize, Faculty of Natural and Oceanographic Sciences, U. of Concepción, Chile

FUNDED PROPOSALS    **2007-2010** The dynamics of waters on the inner shelf in an upwelling region: the role of winds, river discharges and coastline. (Co-investigator with Marcus Sobarzo (PI) and Dante Figueroa, FONDECYT-Chile Proposal #1070501)

AT SEA EXPERIENCE    **2008** R/V R.H. Brown, STRATUS/VOCALS Cruise  
**2005** R/V Tioga, Mooring recovery cruise  
**2005** R/V Revelle, CLIVAR P16S Cruise  
**2000** R/V Melville, CLIVAR/EPIC Cook2 Cruise  
**1998** L/C Kay-Kay, FONDECYT Thioploca Cruise  
**1997** R/V Vidal Gormaz, FONDAP-HUMBOLDT Cruise  
**1997** R/V Abate Molina, JGOFS-Chile XV Cruise  
**1994-1998** L/C Kay-Kay, Multiple short-term teaching cruises

TEACHING AND MENTORING    University of Concepción, Department of Oceanography, Chile  
**2009** Lecturer, Introduction to Oceanography I.  
**2009** Lecturer, Physical and Ecological Processes on the Inner Shelf. Austral Summer Institute.

MIT, Department of Earth, Atmospheric and Planetary Sciences, USA  
**2004-2006** Mentor, EAPS Graduate Student Mentoring program.

University of Concepción, Departments of Oceanography & Zoology, Chile  
**2000** Teaching Assistant, Ecology of Populations and Communities.  
**1999-2000** Teaching Assistant, Introduction to Physical and Geological Oceanography.  
**1999** Teaching Assistant, Fundamentals of Scientific Research.  
**1998** Teaching Assistant, General Ecology.  
**1995-1997** Teaching Assistant, Biology II.

University of Concepción, Department of Geophysics, Chile  
**1999** Research Assistant, Update of physics courses for students in biology-related fields.  
**1995** Teaching Assistant, Physics I.

Catholic University of Concepción, Center for Technical Studies, Chile  
**1996** Teaching Assistant, Marine Ecology for Fisheries Students.

PROFESSIONAL ACTIVITIES    **2003-present** Member, American Geophysical Union  
**2006** Speaker at Antarctic Peninsula Climate Variability: Observations, Models, and Plans for IPY Research. University of Colorado.  
**2006** Speaker at SO GLOBEC Circulation, Hydrography, Modeling Workshop. Center for Coastal

and Physical Oceanography, Old Dominion University.

**2006** Invited Speaker, Department of Geophysics, University of Chile, Chile.

**2006** Invited Speaker, Department of Geophysics, University of Concepción, Chile.

**2005** Invited Speaker, Department of Geophysics, University of Concepción, Chile.

**2006** Participant in Second Finite Volume Coastal Ocean (FVCOM) User Workshop. University of Massachusetts Dartmouth.

**2004** Participant in First Finite Volume Coastal Ocean (FVCOM) User Workshop. University of Massachusetts Dartmouth.

**2003** Participant in Estuarine and Coastal Fluid Dynamics Summer School. Friday Harbor Labs, University of Washington.

**2002** Participant in NATO Advanced Study Institute The Ocean Climate Cycle and Climate. Middle East Technical University, Ankara, Turkey.

#### PUBLICATIONS

**Moffat, C.**, B. Owens and R.C. Beardsley. On the characteristics of Circumpolar Deep Water intrusions to the west Antarctic Peninsula continental shelf. *Journal of Geophysical Research*, in press.

**Moffat, C.**, R.C. Beardsley, B. Owens and N. Van Lipzig, 2008. A first description of the Antarctic Peninsula Coastal Current. *Deep-Sea Research Part II*, **55** (3-4): 277-293.

Beardsley, R.C., **C. Moffat**, L. Padman, R. Muench, and W.B. Owens, 2007. US SO GLOBEC hydrographic and circulation studies. *GLOBEC International Newsletter*, **13** (1): 52-54.

Figueroa, D. and **C. Moffat**, 2000. On the influence of topography in the induction of coastal upwelling along the Chilean Coast. *Geophysical Research Letters*, **27** (23): 3905-3908.

#### CRUISE AND TECHNICAL REPORTS

**Moffat, C.**, R.C. Beardsley, R. Limeburner, W.B. Owens, M. Caruso, and J. Hyatt, 2005. Southern Ocean GLOBEC Moored Array and Automated Weather Station Data Report. *Woods Hole Oceanographic Institution Technical Report*, WHOI-2005-07, 128pp.

Lucas, L., B. Way, R. Weller, P. Bouchard, W. Ostrom, A. Fischer, **C. Moffat**, W. Schneider and M. Fewings, 2001. Long-term evolution and coupling of the boundary layers in the Stratus Deck Regions of the eastern Pacific (STRATUS). *Woods Hole Oceanographic Institution Technical Report*, WHOI-2001-04; UOP-2000-01, 105pp.

#### PAPERS IN REVIEW AND PREPARATION

**Moffat, C.**, and R. Dorland. Quantification of melt rates from Georges VI sound, Antarctic Peninsula. In preparation for *Deep Sea-Research*.

**Moffat, C.**, M. Sobarzo and W.B. Owens. Subtidal circulation on the inner-shelf off Concepción, Chile. In preparation for *Journal of Geophysical Research*.

**Moffat, C.** A numerical study of the dynamics of buoyant plumes to downwelling-favorable wind forcing. In preparation for *Journal of Physical Oceanography*.

#### SELECTED CONFERENCE ABSTRACTS

**Moffat, C. F.**, R.C. Beardsley, W.B. Owens, 2006. A first description of the Adelaide Island Coastal Current (AICC), Antarctic Peninsula. *Eos Trans. AGU*, 87(36), Ocean Sci. Meet. Suppl., OS33I-04.

**Moffat, C.**, R. Beardsley, B. Owens, R. Limeburner, 2005. A first description of the Adelaide Island Coastal Current (AICC), western Antarctic Peninsula. Gordon Research Conference on Coastal Ocean Circulation.

**Moffat, C. F.**, R.C. Beardsley, R. Limeburner, W.B. Owens, 2003. Subtidal Circulation in a

Submarine Canyon, Western Antarctic Peninsula. *Eos Trans. AGU*, 84(52), Ocean Sci. Meet. Suppl., OS32C-18.

Figueroa, D. and **C. Moffat**, 2000. Seasonal variability of the coastal upwelling off Concepción (37°S), Chile. 6th International Conference on Southern Hemispheric Meteorology and Oceanography.