

Alfonso Fernández

Hydroclimate | Cryosphere | Mountain Environments
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 Martínez de Rozas 1145, Apt. 803, Concepción, Chile

EDUCATION

- Ph.D. **The Ohio State University, Columbus, Ohio, USA, 2014**
Waning and waxing of mountain glaciers in South America: a modeling approach over multiple spatial and temporal scales
 Committee: Dr. Bryan Mark (adviser), Dr. David Bromwich, Dr. Michael Durand, Dr. Jialin Lin, and Dr. Lonnie Thompson.
- M.Sc. **Universidad Austral de Chile, Valdivia, Chile, 2009**
Patterns and Controls in the distribution of Chilean glaciers: the memory of the landscape
 Adviser: Dr. Mario Pino.
- Bs. **Universidad de Chile, Santiago, Chile, 2001**
 Professional license in 2003.

ACADEMIC APPOINTMENTS

- 2016 - present: **Associate Professor**, Universidad de Concepción, Chile, Department of Geography.
- 2015 - 2016: **Assistant Professor**, Universidad de Concepción, Chile, Department of Geography.
- 2014 - 2015: **Postdoctoral Researcher** and **Research Associate**, The Ohio State University, USA, Byrd Polar and Climate Research Center.
- 2010 - 2014: **Graduate Research Associate**, The Ohio State University, USA, Byrd Polar and Climate Research Center & Department of Geography.
- 2007 - 2010: **Instructor Professor** (equivalent to Lecturer), Universidad de Concepción, Chile, Department of Geography.
- 2006 - 2007: **Adjunct Professor** (equivalent to Adjunct Lecturer), Universidad de Playa Ancha de Ciencias de la Educación, Chile, Division of Geography.
- 2000 - 2002: **Teaching and Research Assistant**, Universidad de Chile, Chile, Department of Geography.

PROFESSIONAL APPOINTMENTS

- 2004 - 2007: **Professional Geographer**, Hydrographic and Oceanographic Service of the Chilean Navy, Valparaíso, Chile.
- 2002 - 2003: **Professional Geographer**, DEBAR Environmental Consulting, Santiago, Chile.

AWARDS AND HONORS

- 2018: **American Geophysical Union, Journal of Advances in Modeling Earth Systems**: 2016-2017 journal's top 10 most downloaded papers (<https://goo.gl/rjxjCi>).
- 2016: **World Meteorological Organization - CORDEX program**: Early-career scholarship for attending the International Conference on Regional Climate-CORDEX, Stockholm, Sweden (\$3,000 USD).
- 2014: **E. Willard and Ruby S. Miller** fellowship for best academic achievement. Department of Geography. The Ohio State University (\$5,000 USD).
- 2013: **T.R Lakshmanan and Lata R. Chatterjee** Graduate Scholar in Geography. Department of Geography. The Ohio State University (\$3,000 USD).
- 2012: **The Fenburr Travel Scholarship** Department of Geography The Ohio State University (\$1,000 USD).
- 2010: **Best graduate** award. College of Sciences. Universidad Austral de Chile.
- 2009: **Chile government fellowship** for Graduate Studies in the United States (CONICYT: National Commission for Science and Technology). Competitive scholarship with about 4,500 applicants per year and a success rate less than 12%. In 2009, I was selected within the top 5% of 4,419 applicants (\$180,000 USD).

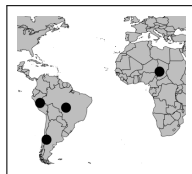
RESEARCH EXPERIENCE

TOPICS

Glacier-Climate interactions
Water resources
Hydroclimatic changes and modeling
Coupled human and natural systems
Mountain Geography
Geomorphology

REGIONS

Tropical Andes
Subtropical Andes
Sub-Saharan Africa
Amazon Basin



WEB PROFILES

CONICYT: <https://goo.gl/NM6wOP>
Google Scholar: <https://goo.gl/Q96ael>
ORCID: <https://goo.gl/OIK42k>
Linkedin: <https://goo.gl/zlwPAe>
Mendeley: <https://goo.gl/YsKOC4>
ResearchGate: <https://goo.gl/ME1Klr>
Twitter: <https://goo.gl/FFYyHG>

GRANT PROPOSALS

IN REVIEW

- None.

FUNDED

- 2018 - 2019: **PI:** National Geographic Society, Late Holocene glacier fluctuations in the Sierra Velluda, Central-South Chile: filling the gap that becomes critical in projected hydroclimatic scenarios (USD \$25,250).
Role: Project coordination, rock sampling and glacier reconstruction.
- 2017 - 2019: **PI:** FONDEF - CONICYT (Chilean Fund for Development of Science and Technology - Chilean Council for Science and Technology): Implementation and validation of an early warning system for hydrometeorological hazards based upon unmanned aerial vehicles (USD \$320,000). 10% success rate (44 out of 429 proposals selected).
Role: Project coordination, weather-climate analysis, flooding modeling.
- 2017 - 2020: **Co-I:** FONDECYT-CONICYT (Chilean Fund for Science and Technology - Chilean Council for Science and Technology): Incendios forestales, pérdida de diversidad y debilitamiento de economías campesinas, en el contexto del modelo forestal Chileno (Wildfires, biodiversity loss and weakening of rural economies under the Chilean forestry model). USD \$270,000 (competitive grant with less than 30% success rate. For the 2017 round, only 28.2% of 1850 proposals were selected).
Role: Application of the WRF-SFire model to simulate fire spread according to different hydroclimatic and land-cover scenarios.
- 2017 - 2018: **Co-I:** Banco de Desarrollo de América Latina (CAF): Estudios del índice de vulnerabilidad y riesgo de Territorio del Área Metropolitana de Valparaíso al Cambio Climático e identificación de las respectivas medidas de adaptación (Studying climate change vulnerability and risks of the Valparaíso Metropolitan Area and identification of adaptation measures). USD \$128,435. This is a Climate Services applied research.
Role: Dynamical downscaling of CMIP5 projections and calculation of climate indices.
- 2016 - 2019: **PI:** FONDECYT-Iniciación (equivalent to NASA Early Career Investigator Program in Earth Science): Developing mechanistic understanding of the snowline's role on the differential climatic sensitivity along mountain glaciers. USD \$130,000 (competitive grant with 30% success rate on average. For the 2016 round, only 27.2% of 1058 proposals were selected).
Role: Project coordination, analysis of climatic data, climatic numerical modeling aloft glacierized and snow covered areas.
- 2015 - 2019: **Co-I:** Ohio Supercomputer Center funded project: AMAZONIAN-LINCAGES: Amazonian Land-cover-INDuced Climate And Glacier Enhanced System (PAS0538-2). Project started July 2015. 200,000 Resource Units.
Role: In charge of running climatic simulations using the WRF regional climatic model. Using model output to force a glacier model in the Peruvian Andes.
- 2014 - 2017: **Postdoctoral Researcher** NSF-funded project: Exploring Social, Ecological, and Hydrological Regime Shifts in the Logone Floodplain of Cameroon (<https://mlab.osu.edu/morsl>). USD \$1,425,000.
Role: Cooperation in the writing process (in charge of the hydroclimatic section), In charge of hydraulic-hydrologic modeling, remote sensing analysis, and climatic analysis.

- 2012 - 2014: **Co-I:** Ohio Supercomputer Center funded project: Climatic forcing on glacier surface mass balance changes along north-central Peru: a modeling perspective (PAS0538-1). 5,000 Resource Units.
Role: In charge of running climatic simulations using the WRF model. Developing of a glacier mass balance model.
Co-I: Association of American Geographers Dissertation Research Grant: Waning and waxing of mountain glaciers in South America: a modeling approach over multiple spatial and temporal scales. USD \$500.
Role: Developing of a glacier mass balance model.
- 2009 - 2011: **Co-I:** Research office Universidad de Concepción: Scientific tourism in Chilean Patagonia: a proposal of touristic circuits related with glaciers in south Aysén. USD \$10,000.
Role: In charge of glacier mapping in Patagonia using remote sensing and GIS.
Co-I Research office Universidad de Concepción: Evaluating natural risks on a socioeconomically-degraded territory in provincia de Arauco, VIII region. USD \$10,000.
Role: In charge of geomorphometry analysis using GIS and remote sensing.
- 2008 - 2010: **PI** Research office Universidad de Concepción: Volume fluctuations of Sierra Velluda glaciers in the last decades, and the impact on the natural landscape of the Laguna del Laja National Park. USD \$10,000.
Role: Project coordination, remote sensing of snow and ice, and climatic analysis.
Co-I Research office Universidad de Concepción: Chilean Oceanic Island region: diagnosis of the physical setting for their integration and sustainable development. USD \$10,000.
Role: In charge of topographic measurements, geomorphometry analysis and topographic surveying.
- 2007 - 2009: **Co-I** Research office Universidad de Concepción: Holocene uplift rate of the shore at Talcahuano-Coronel and its relationship with subduction earthquakes. USD \$10,000.
Role: In charge of topographic measurements and geomorphometry analysis using using DEMs and topographic surveying.

SCHOLARLY WORK

PUBLICATIONS IN PREPARATION

1. **Fernández A.**, Montenegro A., Mark B., Postigo J., Gabrielli P., Hellström R. Studying the effects of Amazonian land cover change on the mass balance of Tropical Glaciers.

PUBLICATIONS SUBMITTED AND IN REVIEW

4. Labore S., Phang S.C., Ahmadou M., Durand M., **Fernández A.**, Hamilton I.M., Henry N., Kari S., Mahamat A., Mark B.G., Scholte P., Shastry A., Xiao N., Ziebe R., Moritz M. Research in the “Red Zone”: Fieldwork constrains foster interdisciplinary integration. The Geographical Journal. *Accepted with minor revisions*
3. Phang, S.C., Laborde, S., Ziebe, R., Moritz, M., Mohr, B., Durand, M., **Fernández A.**, Kari, S., Mark, B., Murumkar, A., Shastry, A., Hamilton, I.M.. Trading catch for vulnerability: fishing canal specialization in the Logone Floodplain fishery, Cameroon. Fisheries Research.
2. Comin, A., Schumacher, V., Justino, F., **Fernández A.** Impact of different microphysical parameterizations on extreme snowfall events in the Southern Andes. Weather and Climate Extremes
1. Quezada, J., Jaque E., Catalán, N., Belmonte A., **Fernández A.**, Isla, F. Splay fault activity in the overlap rupture zone of the 1960 Mw=9.5 and 2010 Mw=8.8 south Chile megathrust earthquakes. Andean Geology.

PUBLISHED RESEARCH PAPERS (PARTICIPATION: [>] → LED; [=] → 30-50% ; [<] → LESS THAN 30%)

21. **Fernández A.**, Muñoz A., González-Reyes A., Aguilera-Betti I., Toledo I., Puchi P., Sauchyn D., Crespo S., Frene C., Mundo I., González M., Vignola R. (2017). Dendrohydrology and water resources management in South-Central Chile: Lessons from the Río Imperial streamflow reconstruction. Hydrology and Earth System Sciences Discussions (preprint). doi: 10.5194/hess-2017-478.
Participation: Tree-ring sampling, statistical analysis, and writing [=].
20. Eddy A.M., Mark B.G., Baraer M., McKenzie J., **Fernández A.**, Welch S., Fortner S. (2017). Exploring Patterns and Controls on the Hydrochemistry of Proglacial Streams in the Upper Santa River, Peru. Rev. Glaciares y Ecosistemas Montaña, 3, 41257.
Participation: Water sampling, laboratory processing, writing and discussion of results [<].
19. Guittard A., Baraer M., McKenzie J.M., Mark B.G., Wigmore O., **Fernández A.**, Rapre A.C., Walsh E., Bury J., Carey M., French A., Young K.R. Trace metal contamination in the glacierized Rio Santa Watershed, Peru. (2017). Environmental Monitoring and Assessment. doi: 10.1007/s10661-017-6353-0
Participation: Water sampling, laboratory processing, writing and discussion of results [<].

18. Mark B.G., and **Fernández A.** (2017): The significance of mountain glaciers as sentinels of climate and environmental change. *Geography Compass* 11(6): e12318. doi: 10.1111/gec3.12318.
Participation: Both authors contributed equally to this paper [=].
17. Aguilera-Betti I., Muñoz A., Stahle D., Figueroa G., Duarte F., González-Reyes A., Christie D., Lara A., González M., Sheppard P., Sauchyn D., Moreira-Muñoz A., Toledo-Guerrero I., Olea M., Apaz P., **Fernández A.** (2017): The first millennium-old *Araucaria araucana* specimen in Patagonia. *Tree-Ring Research* 73(1): 53-56.
Participation: Cooperation in tree-ring sampling, discussion of results, and in the writing of the paper [<].
16. Hellström R., **Fernández A.**, Mark B.G., Covert J., Cochachín A, Gómez J. (2017): Incorporating Autonomous Sensors and Climate Modeling to Gain Insight into Seasonal Hydrometeorological Processes within a Tropical Glacierized Valley. *Annals of the American Association of Geographers* 107(2): 260-273.
Participation: Planning, implementation and analysis of numerical climatic simulations using the WRF model; cooperation in discussion of results; cooperation in the writing of the paper [=].
15. Laborde S., **Fernández A.**, Phang S.C., Henry N., Jung H.C., Mahamat A., Ahmadou M., Labara B., Kari S., Hamilton I., Durand M., Mark B.G., Xiao N., Ziebe R., Moritz M. (2016): Social-ecological feedbacks lead to unsustainable lock-in in an inland fishery. *Global Environmental Change* 41: 13-25.
Participation: Analysis of flooding patterns using remote sensing; cooperation in theoretical discussion of results; cooperation in the writing of the paper [=].
14. **Fernández A.**, Najafi M.R., Durand M., Mark B.G, Moritz M., Jung H-C., Shastry A.R., Laborde S., Phang S.C., Hamilton I.M., Xiao N. (2016): Testing the skill of numerical hydraulic modeling to simulate spatiotemporal flooding patterns in the Logone floodplain, Cameroon. *Journal of Hydrology* 539: 265-280.
Participation: Planning, implementation and analysis of numerical hydraulic simulations using the LISFLOOD-FP model; Statistical analysis of time series; cooperation in analysis of satellite imagery; writing of the paper [>].
13. **Fernández A.** and Mark B.G. (2016): Modeling modern glacier response to climate changes along the Andes Cordillera: a multi-scale review. *Journal of Advances in Modeling Earth Systems* 8(1): 467-495.
Participation: Design of the paper; literature review and analysis; writing of the paper [>].
12. Moritz M., Laborde S., Phang S-C., Ahmadou M., Durand M., **Fernández A.**, Hamilton I.M., Kari S., Mark B., Scholte P., Xiao N., Ziebe R. (2016): Studying the Logone Floodplain as a Coupled Human and Natural System. *African Journal of Aquatic Science* 41(1): 99-108.
Participation: Cooperation in the discussion of ideas and writing of the paper [<].
11. Belmonte A., Jaque E., Quezada J., **Fernández A.**, Donoso C., Carteau C. (2015): Study of site effects associated to the 2010 Maule earthquake in zones characterized by the presence of wetlands in the Bío Bío region, Chile. *Geografía Física e Dinámica Cuaternaria* 38: 3-14.
Participation: Cooperation in planning of the research; cooperation in fieldwork sampling; cooperation in discussion of results; cooperation in the writing of the paper [<].
10. Jaque E., Huillñir V., **Fernández A.** (2013): Presiones de borde en los sistemas naturales protegidos; efectos sobre su conservación. Parque Nacional Laguna del Laja, Chile. *Revista Geografía Espacios* 3(5): 55-67.
Participation: Cooperation in discussion of results [<].
9. Quezada J., Jaque E., **Fernández A.**, Vásquez D. (2012): Cambios en el relieve generados como consecuencia del terremoto Mw = 8,8 del 27 de febrero de 2010 en el centro-sur de Chile. *Revista Geográfica Norte Grande*. 53: 35-55.
Participation: Cooperation in fieldwork; cooperation in analysis and discussion of results [<].
8. Martínez C., **Fernández A.** and P. Rubio. (2012): Caudales y variabilidad climática en una cuenca de latitudes medias en Sudamérica: río Aconcagua, Chile Central (33°S). *Revista Boletín de Geógrafos Españoles (AGE)*. 58: 227-248.
Participation: Statistical analysis of climatic trends; cooperation in discussion of results; cooperation in the writing of the paper [=].
7. Isla I., Quezada J, Martínez C., **Fernández A.**, Jaque E. (2012): The evolution of the Bío Bío delta and the coastal plains of the Arauco gulf, Bío Bío region: the Holocene sea-level curve of Chile. *Journal of Coastal Research*. 28(1): 102-111.
Participation: Cooperation in fieldwork sampling; cooperation in discussion of results; cooperation in the writing of the paper [<].

6. Quezada, J., Díaz K., Moreira R., Jaque E., Belmonte A., **Fernández A.**, Martínez, C. (2012): Comment to "Nature and tectonic significance of co-seismic structures associated with the Mw 8,8 Maule earthquake, central-southern Chile forearc" from Arriagada et al. (2011). *Journal of Structural Geology* 37: 253-255.

Participation: Cooperation in discussion of arguments [<].

5. **Fernández A.**, Santana A., Jaque E., Martínez C., Sáez R. (2011): Glacier changes on Sierra Velluda massif, Chile (37°S): mountain glaciers of an intensively-used mid-latitude landscape (preprint). *The Cryosphere Discussions* 5: 1-36.

Participation: Study design; Satellite imagery and GIS analyses; cooperation in discussion of results; writing of the paper [>].

4. Quezada, J., Jaque E., Belmonte A. **Fernández A.**, Vásquez D., Martínez C. (2010): Movimientos cosísmicos verticales y cambios geomorfológicos generados durante el terremoto Mw= 8,8 del 27 de febrero de 2010 en el centro sur de Chile. *Revista Geográfica del Sur* 2: 11-4.

Participation: Cooperation in fieldwork sampling; cooperation in discussion of results; cooperation in the writing of the paper [<].

3. Quezada, J., Jaque E., Belmonte A. **Fernández A.**, Vásquez D., Martínez C. (2010): Cambios geomorfológicos ocasionados por el evento sísmico del 27 de febrero de 2010 en el centro-sur de Chile. *Revista Obras y Proyectos* 8: 4-11.

Participation: Cooperation in fieldwork sampling; cooperation in discussion of results; cooperation in the writing of the paper [<].

2. **Fernández A.**, Araos J., Marín J. (2010): Inventory and geometrical changes in small glaciers covering three Northern Patagonian summits using remote sensing and GIS techniques. *Journal of Mountain Science* 7: 26-35.

Participation: Study design; Satellite imagery and GIS analyses; cooperation in discussion of results; writing of the paper [>].

1. **Fernández A.**, Rivera A., Rodrigo C. (2006): Variaciones recientes de glaciares entre 41°S y 49°S y su relación con los cambios climáticos. *Revista Geográfica del Instituto Panamericano de Geografía e Historia (IPGH)* 139: 39-69.

Participation: Study design; Satellite imagery and GIS analyses; cooperation in discussion of results; writing of the paper [>].

PUBLISHED BOOK CHAPTERS (PARTICIPATION: [>] → LED; [=] → 30-50% ; [<] → LESS THAN 30%)

2. Mark B., Baraer M., **Fernández A.**, Immerzeel W., Moore R., Weingartner R. (2015): Glaciers as water resources. Chapter 11 in: Huggel C., Carey M., Clague J., Käb A. (Eds.): *The High-Mountain Cryosphere: Environmental Changes and Human Risks*. Cambridge University Press 184-203.

Participation: Cooperation in the discussion of ideas and writing of the paper [<].

1. Martínez C., Jaque E., Quezada M., Flores L., Quezada J., **Fernández A.** (2009). Aplicaciones de modelos de ajuste para el análisis de los cambios históricos de la línea litoral en grandes ensenadas. Ejemplos en Chile. *Metodologías en Teledetección aplicada a la prevención de amenazas naturales en el litoral, Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo* 159-163.

Participation: Cooperation in the discussion of ideas and writing of the paper [<].

ABSTRACTS FROM TALKS AND POSTERS PRESENTED AT SYMPOSIA

60. **Fernández A.** (2018). Influencia del Amazonas en los glaciares tropicales. Primer congreso de la Sociedad Chilena de la Criósfera.
59. Hellström R., **Fernández A.**, Covert J., Mark B.G. (2018). Coupling a decade of surface observations and satellite data to reveal convective forcing of tropical glacier mass balance in the Peruvian Andes. 18th Conference on Mountain Meteorology. American Meteorological Society (abstract 346062).
58. **Fernández A.**, Fuentes, R., Jaque, E., Fernández, S. (2017). Impact of land use change on the temperate forest of South Central Chile. American Geophysical Union-Fall meeting (GC51A-0800).
57. Mark B., **Fernández A.**, Gabrielli P., Montenegro A., Postigo J., Hellström R. (2017). Studying the effects of amazonian land cover change on glacier mass balance in the Tropical Andes. American Geophysical Union-Fall meeting (C33D-1237).
56. Shastry A., Durand M., **Fernández A.**, Phang S.C., Hamilton I., Laborde S., Mark B.G., Moritz M., Neal J. (2017). Hydrodynamic Modeling to Assess the Impact of Man-Made Fishing Canals on Floodplain Dynamics: A Case Study in the Logone Floodplain American Geophysical Union-Fall meeting (EP11A-1553).
55. Fernández, S., Jaque, E., **Fernández A.**, Fuentes, R. (2017). Governance amid spatial fragmentation, wildfires, and drought: studying the impacts of the Chilean Forestry Model in Central-South Chile. 2017 Lund Conference on Earth System Governance.
54. Laborde S., **Fernández A.**, Ahmadou M., Durand M., Hamilton I., Kari S., Mahamat A., Mark B., Phang S.C., Shastry A., Ziebe R., Moritz M. (2017). How fast does the Logone floodplain dry? Social and cultural relevance of rates of change in river discharge and floodplain water levels. 20th International River symposium and Environmental Flows Conference.

53. Phang S.C., Hamilton I., Laborde S., **Fernández A.**, Murumkar, A., Shastry A., Durand M., Mark B.G. and Moritz M. (2017). Bridging the Gap Between Humans, Water and Fish; An Integrated Model of a Coupled Inland Fishery System to Direct Development Policies. 147th Annual Meeting of the American Fisheries Society.
52. Hellström R., **Fernández A.**, Mark B.G., Covert J., Cochachín A, Gómez J. (2017). Incorporating Autonomous Sensors and Climate Modeling to Gain Insight into Seasonal Hydrometeorological Processes within a Tropical Glacierized Valley. Association of American Geographers, Annual meeting.
51. Phang S.C., Durand M., **Fernández A.**, Hamilton I., Laborde S., Mark B., Murumkar, A., Shastry A., Moritz M. (2017). Putting the numbers in coupled human and natural systems conceptual models. Association of American Geographers, Annual meeting.
50. Shastry A., Durand M., Neal J., **Fernández A.**, Arabi M., Hamilton I., Kari S., Laborde S., Mark B.G., Moritz M., Phang S.C. (2016). Predicting the Effects of Man-Made Fishing Canals on Floodplain Inundation? A Modelling Study. American Geophysical Union-Fall meeting.
49. **Fernández A.**, Mark B.G. (2016). Using dynamical downscaling to force a glacier surface energy and mass balance model: case in the Peruvian Andes. International Conference on Regional Climate-CORDEX.
48. Phang S.C., Laborde S., Moritz M., Durand M., **Fernández A.**; Kari S., Mark B.G., Xiao N., Ziebe R., Hamilton I. (2016). Assessing a fishery from afar - how close can we get without going there?. 7th World Fisheries Congress.
47. **Fernández A.**, Mark B.G. (2016). Climatic forcing of glacier surface mass balance changes along north-central Peru: a modeling perspective. Association of American Geographers, Annual meeting.
46. Guittard A., Baraer M., McKenzie J., Mark B.G., **Fernández A.**, Walsh E., Santos Perez A. (2015). Spatiotemporal variability and differentiation between anthropogenic and natural contamination of heavy metals of surface water: a case study in the Cordillera Blanca, Peru. American Geophysical Union-Fall meeting.
45. Mark B.G., **Fernández A.** (2015). Climatic forcing of glacier surface mass balance changes along north-central Peru: a modeling perspective. American Geophysical Union-Fall meeting.
44. **Fernández A.**, Najafi M.R., Durand M., Mark B.G., Moritz M., Shastry A., Laborde S., Phang S.C., Hamilton I.M., Xiao N. (2015). Modeling annual flooding in the Logone floodplain in Cameroon. American Geophysical Union-Fall meeting.
43. Hellström R., **Fernández A.**, Mark, B.G., Covert, J. (2015). Unraveling tropical mountain hydroclimate through integration of autonomous sensor observations and climate modeling. American Geophysical Union-Fall meeting.
42. Shastry A., Durand M., **Fernández A.**, Hamilton I., Kari S., Labara B., Laborde S., Mark B.G., Moritz M., Neal J., Phang S. C. (2015). Predicting the impacts of fishing canals on Floodplain Dynamics in Northern Cameroon using a small-scale sub-grid hydraulic model. American Geophysical Union-Fall meeting.
41. Phang S.C., Laborde S., Mouzamour, A., Durand M., **Fernández A.**, Hamilton I., Mark B., Xiao N., Ziebe R., Moritz M. (2015). Lessons learned from communicating modelling efforts in big SES projects. Conference on Complex Systems, Arizona.
40. Laborde S., Durand M., **Fernández A.**, Hamilton I., Mark B., Phang S.C., Xiao .N, Ziebe R., Moritz M. (2015). The risk of a computational 'streetlight effect' in social-ecological systems research. Conference on Complex Systems, Arizona.
39. Mark B., **Fernández A.** (2015). Hydro-climatic vulnerability to climate change in the tropical Andean Cryosphere: integrating field and modeling perspectives from north-central Peru. Association of American Geographers, Annual meeting.
38. **Fernández A.**, Mark B., Durand M., Phang S.C., Laborde S., Moritz M., Hamilton I. (2015). Investigating DEM noise reduction and resolution in flood modeling: a case study based on the Logone Floodplain, Cameroon. Association of American Geographers, Annual meeting.
37. Battista R., Mark B., **Fernández A.**, Guittard A. (2014). Assessing changing water quality in Peru due to glacial recession. Richard J. and Martha D. Denman Undergraduate Research Forum, The Ohio State University.
36. **Fernández A.**, Mark B. (2014). Climate drivers of regional changes in Andean glacier surface mass balance. Eastern Snow Conference, June.
35. Mark B., Baraer M., Carey M., French A., Bury J., Young K., McKenzie J., Eddy A., **Fernández A.**, Wigmore O. (2014). From glaciers to the desert: assessing hydrologic change and social vulnerability across a tropical Andean waterscape. Eastern Snow Conference, June.
34. Baraer M., Mark B., In Huh K., McKenzie J., Wigmore O., **Fernández A.** (2014). Glacial retreat and hydrological response across the Rio Santa watershed, Peru. European Geosciences Union General Assembly.

33. **Fernández A.**, Mark B. (2013). Assessing pan-Andean glacier response to climate changes since 1979. American Geophysical Union - Fall meeting.
32. Huh K., Mark B., Baraer M., **Fernández A.**, Ahn Y. (2013). Centennial-scale dynamics of glacier changes and stream flow in the Cordillera Blanca, Peru. American Geophysical Union - Fall meeting.
31. Mark B., Eddy A., Baraer M., McKenzie J., Walsh E., **Fernández A.**, Wigmore O., Battista R., Guittard A. (2013). Characterizing changing stream water quality in a glacierized tropical watershed. American Geophysical Union - Fall meeting.
30. **Fernández A.**, Mark B., Lagos P. (2013). Andean glacier mass balance modeling from dynamically downscaled Climate: challenges and opportunities. WCRP VAMOS/CORDEX Workshop on Latin-America and Caribbean CORDEX LAC: Phase I - South America.
29. **Fernández A.**, Mark B., Pino M. (2013). Unraveling glacier mass balance in South America through numerical models: 1979-2012. Association of American Geographers, Annual meeting.
28. Mark B., Baraer M., McKenzie J., Walsh E., **Fernández A.**, Wigmore O. (2013). Tracking stream flow and water quality below melting Andean glaciers: a survey along the Santa River, Peru. Association of American Geographers, Annual meeting.
27. Baraer M., Mark B., Wigmore O., **Fernández A.**, McKenzie J., Walsh E. (2012). From the Cordillera Blanca to the Pacific Ocean: hydrological changes and consequences across the Rio Santa watershed. American Geophysical Union - Fall meeting.
26. **Fernández A.**, Mark B. (2012). The application of a regionally distributed glacier-climate model and a dynamical downscaling in the central Andes of Chile and Argentina (30°S to 37°S): first results. International symposium on glaciers and ice sheets in a warming climate, University of Alaska Fairbanks, Alaska, June.
25. Quezada J., Torrejón F., Jaque E., **Fernández A.**, Belmonte A., Martínez C. (2012). Comparación entre el terremoto Mw=8,8 del 27 de febrero de 2010 y su predecesor de 1835. XIII Congreso Geológico Chileno, 100-102.
24. Quezada J., Jaque E., **Fernández A.**, Belmonte A., Martínez, C. (2012). Ciclo sísmico anómalo en la Isla Mocha (38.3°S-38.4°S). XIII Congreso Geológico Chileno, 114-116.
23. Quezada J., Torrejón F., Jaque E., **Fernández A.**, Belmonte A., Martínez C. (2012). Segmentación sísmica en el ancho del contacto interplaca en el centro sur de Chile. XIII Congreso Geológico Chileno, 174-176.
22. Quezada J., Jaque E., **Fernández A.**, Belmonte A., Martínez C. (2012). La Península de Arauco (37.15°S-37.9°S): barrera y aspereza sísmica? XIII Congreso Geológico Chileno, 177-179pp.
21. de la Peña J., Jaque E., **Fernández A.** (2011). Reconocimiento de áreas de riesgos de movimientos en masa a la zona urbana de Coronel según el método Analyst Hierarchy Process. Congreso de Geografía, Chile.
20. **Fernández A.**, Jaque E., Martínez C., Santana A. (2010). Glacier Changes on Sierra Velluda massif, Chile (37°30'S): an approach to the explicative factors in a transitional climate setting. VICC2010 Conference.
19. Huiliñir V., Jaque E., **Fernández A.** (2010). Efectos de los cambios de uso del suelo en la conservación de los Sistemas Naturales Protegidos: caso de estudio Parque Nacional Laguna del Laja. Congreso Nacional de Geografía, Chile.
18. Orellana P., Martínez C., Portilla D., Jaque E., **Fernández A.**, Quezada J. (2009). Caleta modelo isla Alejandro Selkirk, archipiélago de Juan Fernández: intervención arquitectónica desde la protección del medio natural y la identidad cultural. Simposio Desarrollo, Ciudad y Sostenibilidad.
17. Riquelme N., Muñoz A., **Fernández A.**, Cuq E., Lara A., Álvarez, C. (2009). Efecto del Campo de Hielo Norte en la relación clima-crecimiento del *Nothofagus pumilio*. XVI Reunión Anual de la Sociedad de Ecología de Chile.
16. **Fernández A.**, Quezada J., Martínez C., Jaque E. (2009). Geomorfometría digital de las Islas Oceánicas de Chile y los controles en la evolución geomorfológica. XII Congreso Geológico Chileno.
15. Sáez R, **Fernández A.** (2009). Webmapping de la información glaciológica de la Sierra Velluda (37°S): base geoinformática para el apoyo en la divulgación científica y la toma de decisiones a nivel local en la región del BíoBío. XXX Congreso Nacional y XV Internacional de Geografía.
14. Santana A., **Fernández A.** (2009). Análisis comparativo de métodos de estimación de superficies glaciadas en Chile centro-sur a través de sensoramiento remoto: caso Sierra Velluda (37°S). XXX Congreso Nacional y XV Internacional de Geografía.
13. Gómez M., **Fernández A.** (2009). Estudio de las fluctuaciones de nieve en Chile centro-sur mediante el uso de imágenes de libre acceso. XXX Congreso Nacional y XV Internacional de Geografía.
12. Quezada J., **Fernández A.**, Martínez C., Pineda V., Jaque E, Isla F. (2009). Alzamiento holoceno en el litoral del Golfo de Arauco (37°S) y su relación con los terremotos de subducción. XII Congreso Geológico Chileno.

11. Quezada J., **Fernández A.**, Martínez C., Jaque E. (2009). Evolución geomorfológica y erosión del litoral de Isla de Pascua. 2009: XII Congreso Geológico Chileno.
10. Martínez C., Jaque E., Orellana P., **Fernández A.**, Quezada J. (2009). El proyecto La Región de las Islas Oceánicas de Chile. Avances y perspectivas futuras. XXX Congreso Nacional y XV Internacional de Geografía.
9. Martínez C., Jaque E., Quezada M., Flores L., Quezada J., **Fernández A.** (2009). Spatio-temporal changes of the shoreline in Concon bay, central Chile. 9th International Symposium on GIS and Computer Cartography for Coastal Zone Management, September 30th to October 2nd, Santa Catarina, Brazil.
8. **Fernández A.**, Araos J., Marín J. (2006). Hypsometric analysis of glaciers located at Chilean Andes of Chiloé Continental Area. Symposium on Climate Change: Organizing the Science in the American Cordillera (CONCORD), Mendoza, Argentina.
7. **Fernández A.**, Araos J., Marín J. (2005). Inventario de glaciares del volcán Michimahuida utilizando Sistemas de Información Geográfica (SIG): Resultados preliminares. Simposio Internacional: Nuevos Enfoques de Ciencias del Cuaternario en Fuego-Patagonia, Centro de Estudios de Fuego-Patagonia y Antártica.
6. **Fernández A.** (2003). Recent glacier variations in Southern Chile (42° to 49°S). Symposium on Mass Balance of Andean Glaciers and 1st Mass Balance Workshop on Andean Glaciers, Valdivia, Chile.
5. Aravena J., Lara A., Cuq E., **Fernández A.** (2002). Evidences of neoglacial events inferred from tree ring and aerial photos in arroyo San Lorenzo Valley, Mount San Lorenzo, Chile. 6th International Dendrochronology Conference, Quebec, Canada.
4. Aravena J., Lara A., **Fernández A.** (2002). Evidence of neoglacial events from tree-ring and aerial photos in arroyo San Lorenzo Valley, Mount San Lorenzo, Chile, IAI CRN 03, Annual Science meeting, Oaxaca, Mexico.
3. Rivera A., Casassa G., Bown F., **Fernández A.** (2002). Mass balance of glaciers in Southern Chile, based on Dems from Aster and aerial photographs, European Geophysical Union. Geophysical Research Abstracts (EGS02-A-05852).
2. Aravena J., **Fernández A.**, Lara, A., Rivera A., Villalba R., Wolodarsky-Franke A. (2001). Cambios climáticos durante los últimos siglos en los Andes del sur de Chile a partir de anillos de crecimiento y fluctuaciones. In: 13° Reunion Anual de la Sociedad Botánica de Chile. La Serena, Chile (Gayana Botánica 58[1]).
1. Rivera A., Acuña C., **Fernández A.**, Casassa G. (2001). Use of satellite imagery, aerial photographs and historical data for determining the frontal variations of the glaciers of central-south Chile (33-49° S). 4th International Symposium on Remote Sensing in Glaciology. College Park, Maryland, USA.

PUBLISHED WITHOUT PEER REVIEW

2. Martínez, C., Jaque, E., **Fernández, A.** (2008). Sistemas naturales integrados en Geografía. Ed. Universidad de Concepción, 172pp.
1. **Fernández, A.** (2006). Utilización de la cartografía digital del SHOA: Inventario y cambios de espesor en el casquete del volcán Corcovado. Anuario Hidrográfico y Oceanográfico de la Armada de Chile N° 57: 131-140.

TECHNICAL SKILLS

- **Field sampling:** Water/snow/ice, Cosmogenic nuclides, Tree-rings, Sediments, Radiometry (Remote sensing calibration).
- **Field mapping:** Differential GPS, Geomorphic mapping, Topographic surveying.
- **Programming/Computing:** Linux shell scripting, R, IDL/GDL, \LaTeX , Matlab/Octave, Python, NCL, Netlogo, Fortran.
- **GIS and Remote sensing:** ArcGIS, CarisGIS, ENVI, ERDAS, Globalmapper, GRASS, IDRISI, Ilwis, Mapwindows, PCI Geomatica, QGIS, SagaGIS.
- **Third-party models:** Cellular automata ice flow model (Harper and Humphrey, 2003, GRL), Glacier-climate model (Plummer and Phillips, 2003, QSR), SWAT (Hydrology), WRF (Weather/Climate modeling), LISFLOOD-FP (Hydraulic modeling).
- **Laboratory:** Elemental chemical analysis (ICP-OES/MS) for trace metals, Ion Chromatography for major ions, and sedimentology.
- **Languages:** Spanish (native speaker), English (full professional proficiency).

TEACHING EXPERIENCE

UNIVERSIDAD DE CONCEPCIÓN, DEPARTMENT OF GEOGRAPHY (2007-2010 AND 2015-PRESENT)

- Current graduate seminars: (1) Mountain Systems; (2) Global change, Society and Vulnerability.
- Current undergraduate courses, Geography majors: (1) Climatology; (2) Introduction to Physical Geography (Fundamentos de los Medios Naturales); (3) The Geography of Chile; and (4) I don't believe in Anthropogenic Climate Change. Served around 700 students.
- Previous undergraduate courses, Geography majors: (1) Geomorphology; (2) Assessment of Environmental Risks; (3) Hydrology; (4) Digital Elevation Models; (5) Basic Sedimentology (co-teaching); (6) Mathematics for Geographers (co-teaching); (7) Hydrology; and (8) Coordination and evaluation of Geography Internships.
- Other previous undergraduate courses, Forestry Engineering majors: (1) Bioclimatology. Served 20 students.
- Other previous undergraduate courses, Biology majors: (1) Climatology. Served around 400 students.

UNIVERSIDAD DE PLAYA ANCHA DE CIENCIAS DE LA EDUCACIÓN, DIVISION OF GEOGRAPHY (2006-2007)

- Undergraduate courses: (1) Geomorphology; (2) Applied Geomorphology; and (3) Remote Sensing. Served a total of about 120 students. All courses included lectures and labs.

UNIVERSIDAD DE CHILE, DEPARTMENT OF GEOGRAPHY (2000-2002)

- Undergraduate courses: (1) Geomorphology and (2) Geology. Served a total of about 100 students. Duties included lab preparation and grading, including the final oral examination.

MEMBERSHIP TO SOCIETIES

Association of American Geographers
American Geophysical Union
Yes network
Association of Early Polar Career Scientists
(Alpine Cryosphere Project Group)

SUMMER AND PROFESSIONAL SCHOOLS ATTENDED

2016

1. Regional Climate Model Evaluation System (RCMES - NASA-JPL) training session at ICRC-CORDEX 2016, Stockholm, Sweden. Travel funded by the World Meteorological Organization (worldwide competition, 5 young researchers selected).

2014

1. NASA-JPL Earth Observations Summer School. Pasadena, California, USA. Travel scholarship from NASA-JPL (worldwide competition, 40 young researchers selected, <http://goo.gl/2X8Bsx>).

2013

1. 1st International ACCION/UNESCO Climate School on "Andean Climate Variability and Change". Lima, Peru. Travel scholarship funded by UNESCO (150 applicants, 20 selected).
2. WRF (Weather Research and Forecasting) model tutorial. NCAR, Boulder, Colorado, USA. Travel and fees funded by the Ohio State University

2011

1. Karthaus Summer School on Ice Sheets and Glaciers in the Climate System, Karthaus, Italy (worldwide competition, 36 young researchers selected). Travel and fees funded by the Ohio State University (<https://goo.gl/SGCQio>).

2009

1. Postglacial Isostatic Rebound Modeling Course, COST Initiative ES0701, Landmateriet, Gävle, Sweden (The only Latin American selected). Travel and fees funded by the Universidad Austral de Chile.

2008

1. Paleoclimatology Course, Instituto Argentino de Nivología y Glaciología (IANIGLA), CONICET, Mendoza, Argentina. Travel and fees funded by the Universidad Austral de Chile.
2. Course-workshop on Idrisi Andes, Centro Interamericano del Recurso Agua (CIRA), Universidad Autónoma del Estado de México (UAEM), Toluca, México. Travel and fees funded by the Universidad de Concepción.
3. Dinámica y Evolución Costera, Departamento de Geografía, Universidad de Concepción. Fees funded by the Universidad de Concepción.

2000

1. Field course on Dendroglaciology, Casa Pangué glacier, Chile. Inter American Institute for Global Change Research (IAI).

REVIEWER

- **Journals:** Earth Science Reviews; Frontiers in Earth Science; Geoscientific Instrumentation, Methods and Data Systems; International Journal of Climatology; Investigaciones Geográficas; Quaternary Research; Revista Geográfica del Sur; Regional Environmental Change; The Holocene; Water. Go to: <https://goo.gl/xyMD1H> for details.
- **Grants:** SNSF (Swiss National Science Foundation); FONDECYT (Fondo Nacional de Ciencia y Tecnología), Chile; **Becas Chile** - CONICYT, Chile; **Austral Incuba**, Universidad Austral de Chile; **National Geographic Society**.
- **Other:** IPCC, Co-chair for APECS review on “High Mountain Areas”.

INVITED TALKS

2018

1. Geography Department, Pontifica Universidad Católica de Chile.
2. Geography Department, University of North Carolina - Greensboro.

2017

1. “Glaciologies of Nostalgia”, GAIA-Antártica, Universidad de Magallanes, Punta Arenas, Chile.

2016

1. “Climate Change” School for adults “José Manuel Balmaceda”, Concepción, Chile.

2015

1. “Overview on Andean glaciers and recent global climate change”, LatinNight, Byrd Polar and Climate Research Center, The Ohio State University, March.

2014

1. “Modelación numérica de la interacción clima-glaciar en los Andes” Department of Geology, Universidad Nacional Andrés Bello Viña del Mar campus, Chile, October.
2. “Glaciares, Montañas y Gente (En Español!)” Climate Explorations project, Byrd Polar Research Center, The Ohio State University, September.

2011

1. “Glaciers and Climate Change” for elementary school students in Cranbrook Elementary, Columbus, Ohio.

2009

1. “Climate Change” for high school teachers in “Encuentros con la Geografía”, Universidad de Concepción, Chile.

PROFESSIONAL AND ACADEMIC SERVICE

2018

1. Member of the local committee for the “South America Water from Space Conference”, Santiago, Chile (<https://goo.gl/uMLEYP>).

2017

1. Steering Committee for EarthArXiv, the free preprint service for the Earth Sciences (<http://eartharxiv.org>).
2. Convener of two sessions entitled "Understanding the High-Mountain Water Cycle and Cryosphere in the Anthropocene" (C33D and C41F) at the Fall meeting of the American Geophysical Union (together with Walter W. Immerzeel, Joseph M. Shea, and Jakob F. Steiner).
3. Judge for the Outstanding Student Paper Award (OSPA) program at the American Geophysical Union (AGU) fall meeting.
4. Chair and lecturer on the hydroclimatic session in the international summer school and workshop on "Complex systems", Ngaoundere, Cameroon, May (<https://goo.gl/FHFbdi>).
5. Host of the webinar "Research Processes and Politics in the Peruvian Andes" (speaker, Dr. Mark Carey), Association of Polar Early Career Scientists (<https://vimeo.com/235444089>).
6. Host of the webinar "The first and only ice core histories from the Kilimanjaro ice fields" (speaker, Dr. Lonnie Thompson), Association of Polar Early Career Scientists (<https://vimeo.com/218875030>).

2015

1. Judge for the Outstanding Student Paper Award (OSPA) program at the American Geophysical Union (AGU) fall meeting.
2. Editor in chief "Revista Geográfica del Sur" (since July).

2013

1. American Geophysical Union. Student member at the Executive Committee, Earth and Planetary Surface Processes focus group.
2. Personnel committee representative, Geography Graduate Organization (GGO) executive committee member 2013-2014.
3. Member of the organizing team for the GGO spring panel "Restoring our rivers, imagining our future: The Olentangy in Columbus", April 4th.
4. Organizing session in AAG annual meeting: Global environmental changes in mountain land-water-scapes (sponsored by the Mountain Geography, Geomorphology, and Cryosphere Specialty Groups).
5. Panelist in AAG session: Geography in the Americas: Making the Most of Student Exchanges for Research and Study Abroad (organized by the Latin America Specialty Group).
6. Presentation for Ohio State University Geography 2800 (prof. Alvaro Montenegro). Class size: 36 students.

2012

1. American Geophysical Union. Student member at the Executive Committee, Earth and Planetary Surface Processes focus group.

2011

1. Scientific advisor for the AAC Nikwax Alpine Bellwether Grant "Significant Glaciers of Chile: Ice, Water and Community Survival near Santiago, Chile".

STUDENT ADVISING

POSTGRADUATE

1. Natalia Carmona, Master in Geographical Analysis, Universidad de Concepción, 2017.
2. Vanúcia Schumacher, Ph.D. in Applied Meteorology, Universidade Federal de Viçosa, ongoing (Co-adviser with Dr. Flavio Justino).
3. Alan Pinos, Master in Geographical Analysis, Universidad de Concepción, ongoing.
4. Isabella Ciocca, Master in Regional Sciences, Universidad de Concepción, ongoing.
5. Andreaw Rifo, Master in Regional Sciences, Universidad de Concepción, ongoing.

UNDERGRADUATE (ADVISING OF THE EQUIVALENT TO HONORS THESIS)

1. Marcos Gómez, Bs. Geography, Universidad de Concepción, 2009.
2. Rodrigo Sáez, Bs. Geography, Universidad de Concepción, 2009.
3. Andrés Santana, Bs. Geography, Universidad de Concepción, 2009.
4. Juan Varas, Bs. Geography, Universidad de Concepción, 2017.
5. Iván Belmar, Bs. Geography, Universidad de Concepción, 2017.
6. Mauricio Aleuy, Bs. Geography, ongoing.
7. Walter Bravo, Bs. Geography, ongoing.
8. Leonardo Hernández, Bs. Geography, ongoing.
9. Patricio Torres, Bs. Geography, ongoing.
10. Gabriela Zurita, Bs. Geography, ongoing.

COMMITTEE MEMBER

POSTGRADUATE

1. Javiera de la Peña, Master in Geographical Analysis, Universidad de Concepción, 2017.

UNDERGRADUATE

1. Julio Parra, Bs. Geography, Universidad de Concepción, 2015.
2. Ingrid Cornejo, Bs. Geography, Universidad de Playa Ancha de Ciencias de la Educación, 2006.