

CHRISTOPHER V MAIO

PO Box 750225
Fairbanks, AK 99775
cvmaio@alaska.edu

PROFESSIONAL STATEMENT

I am a coastal geographer and educator applying the principles of geomorphology and stratigraphy integrated with high resolution geophysical, geospatial, and sedimentary tools to research and educate about earth surface processes specifically related to the coastal response to climate change, natural hazards, and human impacts.

EDUCATION

2014	<i>PhD. Environmental Science</i> University of Massachusetts-Boston Guest Student Woods Hole Oceanographic Institution	Boston, MA
2009	<i>M.S. Environmental Science</i> University of Massachusetts-Boston Graduate Certificate of Geographic Information Technology	Boston, MA
2007	<i>B.S. Earth and Geographical Science</i> University of Massachusetts-Boston Summa cum Laude	Boston, MA
2002 – 2005	University of Alaska, Anchorage Biological Science Program	Anchorage, AK

PROFESSIONAL EXPERIENCE

CURRENT

<i>Assistant Professor Coastal Geography</i>	University of Alaska Fairbanks Department of Geosciences	Fairbanks, AK
<i>Adjunct Researcher</i>	Alaska Pacific University Fisheries Aquatic Science & Technology Laboratory	Anchorage, AK
<i>Guest Investigator</i>	Woods Hole Oceanographic Institution Department of Geology and Geophysics <i>Coastal Systems Group</i>	Woods Hole, MA

PREVIOUS

2011 – 2014 <i>Guest Student</i>	Woods Hole Oceanographic Institution Department of Geology and Geophysics Sponsored by Dr. Jeff Donnelly	Woods Hole, MA
2007 – 2014 <i>Teacher's Assistant</i>	University of Massachusetts-Boston School for the Environment courses and field trips	Boston, MA
2012 – 2013 <i>Research Fellow</i>	University of Massachusetts-Boston School for the Environment	Boston, MA
2011 – 2012 <i>Adjunct Faculty</i>	University of Massachusetts-Boston Navitas International Education Program EEOS 101: Introduction to the Global Environment EEOS 478: Academic Skills for Multicultural Students	Boston, MA
2009 – 2011 <i>GIS Consultant</i>	Massachusetts Board of Underwater Archeological Resources Geospatial analysis of historical landscapes	Boston, MA
2000 – 2005 <i>Fisheries Technician III</i>	Alaska Department of Fish and Game Supervised the remote collection, laboratory processing and analysis of fisheries related data.	Homer, AK

SELECTED PUBLICATIONS

PUBLISHED

1. **Maio, CV**, Gontz, AM, Sullivan, R, Madsen, S., Weidman, C, and Donnelly, JP.,
Geologic signatures of storm-driven breaching along a transgressing barrier system, Cape
Cod, USA. *Journal of Coastal Research*, (In Press).
2. **Maio, CV**, Gontz, AM, Weidman, C, and Donnelly, JP, 2014. Late Holocene marine
transgression and the drowning of a coastal forest: Lessons from the past, Cape Cod,
Massachusetts, USA. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 393(C), 146-
148.
3. Gontz, AM, **Maio, CV**, and Rueda, L., 2013. The Duxbury sunken forest - constraints for
local, late Holocene environmental changes resulting from marine transgression, Duxbury
Bay, Eastern Massachusetts, USA: *Journal of Coastal Research*, 29(6A), 168-176.
4. Brown, C, Mastone, VT, and **Maio, CV**, 2013. The Battle of Chelsea Creek May 27-28,
1775: America's Forgotten Revolutionary War Battle. *New England Quarterly*, 86(2), 1-
36.

5. **Maio, CV**, Tenenbaum, DE, Brown, C, Mastone, VT, and Gontz, AM, 2012. Application of geographic information technologies to historical landscape reconstruction and military terrain analysis of an American Revolution battlefield: preservation potential of historic lands in urbanized settings, Boston, Massachusetts, USA: *Journal of Cultural Heritage*, 14(4), 317-331.
6. **Maio, CV**, Gontz, AM, and Tenenbaum, D, 2012. Coastal hazard vulnerability assessment of sensitive historical sites on Rainsford Island, Boston Harbor, Massachusetts: *Journal of Coastal Research*, 28(1), 20-33.
7. Gontz, AM, **Maio, CV**, Berkland, EP, and Wagenknecht, EK, 2011. Assessment of the colonial through industrial aged cemetery on Rainsford Island, Boston Harbor, Massachusetts: *Journal of Cultural Heritage*, 12, 451-458.

UNDER REVIEW

1. Mastone, V.T., Brown, C., and **Maio, C.V.**, (Accepted for Publication). The Revolutionary War battle of Chelsea Creek: Grounding the historical narrative through cultural landscape analysis. *Northeastern Anthropology*.

IN PREPARATION

1. **Maio, CV**, Donnelly, JP, Weidman, C, Gontz, AM., and Sullivan, R., Sedimentary evidence of hurricane strikes in the paleo-environment; Lessons for the future, Waquoit Bay, Massachusetts. *Marine Geology*, (In Prep).
2. **Maio, CV**, Madsen, S., Sullivan, R., and Donnelly, JP. A late Holocene sea-level curve for Waquoit Bay, Massachusetts. *Estuarine Shelf Science*, (In Prep).

PUBLISHED CONFERENCE ABSTRACTS

1. **Maio, C.V.**, Donnelly, J.P., Sullivan, R., Weidman, C.R., and Sheremet, V., 2014, Surge driven return flow results in deposition of coarse grain horizons archiving a 4000 year record of extreme storm events, Cape Cod, Massachusetts, Abstract NH52A-07 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec
<http://abstractsearch.agu.org/meetings/2014/FM/NH52A-07.html>
2. McDermott, K.J., Hawkes, A.D., Donnelly, J.P., Sullivan, R.M., **Maio, C.V.**, Toomey, M.R., and Madsen, S.M., 2014. Reconstructing high-latitude storm events from a fjord in Newfoundland., Geological Society of America Programs with Abstracts, Paper No 311-19. <https://gsa.confex.com/gsa/2014AM/webprogram/Paper247133.html>
3. **Maio, C.V.**, Gontz A.M., Weidman C., and Donnelly, J., 2014. A drowned paleoforest along a Cape Cod Barrier Beach: Lessons from the past, Mashpee, Massachusetts, USA. Geological Society of America Programs with Abstracts, 58-2. URL: <https://gsa.confex.com/gsa/2013NE/webprogram/Paper214818.html>.
4. **Maio, CV**, Donnelly, JP, Wagenknecht, EK, Weidman, C., and Gontz, AM., 2012. Geologic evidence for paleo inlets, ancient forests, and coastal change along a Cape Cod

barrier beach, South Cape Beach, Massachusetts. Geological Society of America *Abstracts with Programs*, Vol. 44, No. 2, p. 89.

5. Gontz, AM, Gosselin, DA, **Maio, CV**, and Wagenknecht, EK, 2011, Sunken forests and submerged landscapes in eastern Massachusetts – records of sea-level rise and Human-landscape interactions: American Geophysical Union Chapman Conference on Society and Climate Change, Santa Fe, NM 20-25 Mar 2011.
6. **Maio, CV**, Gontz, AM, Mastone, VT, 2010, Preliminary non-invasive site assessment and GIS mapping of the Chelsea Creek Battlefield, the first naval engagement of the American Revolution: Combined Northeastern/Southeastern Section, Geological Society of America, *Abstracts with Programs*, Vol. 42, No. 1 p. 142.
7. Gontz, AM, **Maio, CV**, and Gosselin, DG, 2010, Paleo-Landscapes of the Boston Harbor Islands National Park – Former Channels of the Neponset River: Combined Northeastern/Southeastern Section, Geological Society of America, *Abstracts with Programs*, Vol. 41, No. 1, p. 103.
8. **Maio, CV** and Gontz, AM, 2009, A high-resolution examination of coastal trends through the use of orthorectified aerial photographs spanning 67 years, Rainsford Island, Boston Harbor, Massachusetts: Northeastern Section of the Geological Society of America *Abstracts with Programs*, Vol. 41, No. 3, p. 23.
9. Wagenknecht, EK, Gontz, AM, Berkland, EP, and **Maio, CV**, 2009. The search for a late-Colonial through Industrial age cemetery on Rainsford Island, Boston Harbor, Massachusetts: Northeastern Section of the Geological Society of America Annual Meeting, Paper No. 45-7.
10. **Maio, CV** and Gontz AM, 2007, Geophysical site assessment of the wreck of the USS Niagara, Boston Harbor, MA: Northeastern Section, Geological Society of America, *Abstracts with Programs*, Vol. 39, No. 1, p.58.
11. Gontz, A.M., Anderson, C., Berkland, E., Goldstein, E., **Maio, C.V.**, and Wagenknecht, E.K., 2009. Forgotten Landscapes – geophysical based reconstruction of the Northern Declivity during the Revolutionary War Battle of Bunkers Hill, Charlestown, Massachusetts. Geological Society of America, Paper No. 5-1.

NON-PEER REVIEWED

1. **Maio, C.V.**, Balazs, M., Noordeloos, J., Sethi, S., and Harris, B., 2015. Geospatial datasets applicable to an essential fish habitat non-fishing vulnerability assessment: Norton Sound, Alaska. 2015 Final Report to NOAA-NMFS Habitat Division.
2. **Maio, CV**, Berman, G, 2013. What is that sticking out of the sand? *Marine Extension Bulletin*, Woods Hole Sea Grant Program-Cape Cod Cooperative Extension, June (2013), pp. 1-8.
3. Mastone, VC, Brown, C, and **Maio, CV**. 2011. Chelsea Creek – First naval engagement of the American Revolution, Chelsea, East Boston, Revere, and Winthrop, Suffolk County, Massachusetts. Final Technical Report, National Park Service American Battlefield Protection Program Grant Agreement No. GA-2255-09-018.
<http://www.mass.gov/eea/agencies/czm/buar/battle-of-chelsea-creek.html>.

4. **Maio, C.V.**, 2009. The Rainsford Island Shoreline Evolution Study (RISES) Graduate Master's Thesis, University of Massachusetts, Boston, Paper 86. http://scholarworks.umb.edu/masters_theses/86.
5. Gontz, AM and **Maio, CV**, 2007. Geophysical Site Assessment of the Area Reported as the Wreck of the *USS Niagara*: Massachusetts Board of Underwater Archaeological, Department of Coastal Zone Management, Technical Report.

RESEARCH PROJECTS

Coastal Evolution and Hazard Assessment, Goodnews Bay, Alaska

Ongoing – Alaska Sea Grant Funded research focused on assessing the coastal resiliency of Goodnews Bay. The project includes the development of baseline high resolution topographical data, the reconstruction of a late Holocene sea-level history, and a determination of the paleo-evolution of a coastal barrier beach. The project includes a community outreach program.

Coastal geologic evolution and archeology of James Lagoon, Kenai Fjords National Park

Ongoing – Collaborative research between UAF, the Kenai Fjords National Park, the Smithsonian Institution Arctic Studies Center, and the Woods Hole Oceanographic Institution (WHOI) aimed at determining the coastal geographic evolution of the landscape surrounding cultural resources vulnerable to coastal erosion.

Reconnaissance survey of sediment archives of storms and tsunamis along the Kodiak Archipelago and Katmai National Park.

Ongoing – Collaborative research between UAF and the Woods Hole Oceanographic Institution aimed at identifying coastal lagoons and ponds having preservation potential of tsunami and storm sediment archives. The work was carried out within coastal ponds, lagoons, and fjords along the Kodiak Archipelago and Katmai National Park.

Development of quantitative geospatial model to determine non-fishing impacts to Essential Fish Habitat (EFH) in Alaska. Ongoing – A collaborative research project between Alaska Pacific University's Fisheries Aquatic Science, and Technology (FAST) laboratory, NOAA National Marine Fisheries Service Habitat Conservation Division and UAF. The research is aimed at developing a framework for a cumulative impact model to quantify and visualize the risks associated with the interactions between non-fishing impacts and EFH.

Strategic Environmental Research and Development Program (SERDP): Climate change and impacts of sea-level rise on Ronald Reagan Ballistic Missile Defense Test Site, U.S. Army, Kwajalein Atoll (USAKA). 2014 – Assisted in research conducted by WHOI-CSG under PI Jeff Donnelly to acquire high resolution topographic, bathymetric, and marine/terrestrial geophysical datasets to assist in the development of climate models able to assess coastal change under varying climate conditions.

Reconstruction of Holocene sea-level and storm records in the North Atlantic, Newfoundland. Ongoing – Participation under the direction of WHOI’s Jeff Donnelly to collect long sediment cores from within deep fjord basins (70 m) located along the north, south, and east coasts of Newfoundland. The cores may provide valuable datasets that will contribute towards deciphering the linkages between climate change, ocean circulation, sea-level fluctuations, and increased/decreased storminess.

Geological investigations of the Waquoit Bay estuarine system, Mashpee, Massachusetts
Ongoing & Completed – Collaboration with the UMass Boston School for the Environment, the Waquoit Bay National Estuarine Research Reserve (WBNERR) and the Woods Hole Oceanographic Institution’s Coastal Systems Group (WHOI-CSG) to utilize high resolution geophysical, geospatial, and sedimentary methods to identify and map the framework geology and evolution of the area during the late Pleistocene to Holocene time periods. The research elucidates past coastal landscape response to climate fluctuations allowing for a more comprehensive understanding and context to current and future change.

Development of an historical and prehistorical hurricane record for Waquoit Bay (ongoing). Acquisition and analysis of sediment cores to develop a high resolution record of extreme storm events occurring during the past 3600 years based on paleotempestology methods.

Late Holocene sea-level reconstruction, Mashpee, Massachusetts (ongoing). Development of a 1200 year record of sea-level rise for Waquoit Bay. Methods include the collection, radiocarbon aging and microfossil analysis of basal peat samples obtained from a back-barrier saltmarsh.

Paleo-geographic reconstruction of the South Cape Beach ancient forest site (completed). Spatial and temporal reconstruction of the paleo-landscape surrounding the submerged ancient forest site in the area of South Cape Beach State Park. Methods include GIS, AMS radiocarbon dating, and sediment coring.

Geomorphic evolution of the South Cape Beach barrier system (completed). Utilization of ground penetrating radar, GIS, and sediment core data to determine the influence of sea-level rise and extreme weather events on the framework geology and evolution of the barrier system.

Late Pleistocene abrupt climate change in the Beaufort Sea deciphered through deep-ocean sediment cores and microfossil analysis. Summer, 2013 – Participation under the direction of WHOI’s senior scientist Lloyd Keigwin in collaboration with Scripps University on board the U.S Coast Guard Cutter Healy NSF sponsored sediment coring mission 1302. The largest archive of Beaufort Sea sediment cores was collected on the cruise between Point Barrow and Banks Island. Ongoing analysis of sediment cores and geophysical data will greatly enhance understanding of the triggers of Late Pleistocene abrupt climate change.

Application of geographic information technology to reconstruct historical landscapes and analyze environmental change 2011 – Interdisciplinary collaboration with the UMass Boston Fiske Center of Historical Archeology and the Massachusetts Board of Underwater Archeological Resources to apply GIS and historical research to recreate the 1775

landscape of Boston Harbor and determine the preservation potential of historic sites associated with an American Revolution battle. Geospatial data was used to quantify environmental change resulting from anthropogenic modifications.

Paleogeographic evolution of Cape Cod National Seashore's Coast Guard Beach. 2014 – Collaboration between the WHOI, the National Ocean Science Atomic Mass Spectrometry facility at Woods Hole, and the Cape Cod National Seashore. The complex paleolandscape site first became revealed along the steep bluff of the beach after Hurricane Sandy and the February 2013 Blizzard.

RESEARCH FUNDING:

TOTAL \$328,415

1. Alaska Sea Grant, 2015-2017: **\$100,000**
2. NOAA-NMFS, 2015-2016: **\$50,000**
3. NOAA-NMFS, 2014-2015: **\$50,000**
4. National Park Service 2015: **\$19,700**
5. University of Alaska Fairbanks, 2014 URSA Mentor Award: **\$10,000**
6. University of Alaska Fairbanks, 2015 URSA Technology Award: **\$10,000**
7. University of Alaska Fairbanks Office of the Provost, 2015: **\$800**
8. Woods Hole Oceanographic Institution Department of Geology and Geophysics Guest Student Program, 2012–2014: **\$30,000**
9. University of Massachusetts, School for the Environment Research Fellowship, 2012-2013: **\$30,000**
10. University of Massachusetts, Graduate School Assembly Bollinger Research Grant, **\$1,930**, June 2013.
11. University of Massachusetts-Boston, Graduate Studies Doctoral Dissertation Research Grant, 2011-2012: **\$4500**
12. Geological Society of America Graduate Student Research Grant, 2012: **\$1960**
13. National Park Service American Battlefield Protection Program & Massachusetts Board of Underwater Archaeological Resources, The Battle of Chelsea Creek, 2009-2011: **\$19,525**

EDUCATIONAL ACTIVITIES

CURRENT TEACHING

Undergraduate – UAF Department of Geosciences

- GEOG 111, *Physical Geography w/Lab*
- GEOG 339, *Maps & Landscape Analysis*
- GEOG 483, *Research Design, Writing, and Presentation Methods*
- GEOS 330/630, *The Dynamic Alaskan Coastline*

COURSES TAUGHT

Undergraduate – UMass Boston School for the Environment

- EEOS 101, *Introduction to the Global Environment*, Navitas International Education Program, 2011-2012
- EEOS 478, *Academic Skills for Multicultural Students*, 2011-2012

COURSES AS TEACHER’S ASSISTANT

Undergraduate – UMass Boston School for the Environment

- EEOS 203, *Field Trips in Environmental Science*, 2010-2014
- EEOS 402, *Sedimentology & Stratigraphy*, 2011
- EEOS 380, *Applications of Geographic Information Systems*, Spring 2010
- EEOS 327, *Estuarine Geography*, Fall 2010
- EEOS 115, *Environmental Geology*, Fall 2009, Fall 2008, Fall 2007
- EEOS 260, *Global Environmental Change*, Spring 2009, Spring 2008

GUEST LECTURER

Undergraduate – UMass Boston School for the Environment

- EEOS 302, *Geomorphology*, “Aeolian Transport and Deposition,” Fall 2011
- EEOS 120, *Introduction to Environmental Science*, “Coastal Geomorphology,” Fall 2011
- EEOS 402, *Sedimentology & Stratigraphy*, “Coastal Environments,” Spring 2011
- CS 697, *Spatial Data Mining*, “Introduction to Geospatial Analysis,” Fall 2009
- EEOS 102 *World Regional Geography*, “Plate Tectonics and You,” Fall 2008, Fall 2009
- EEOS 260, *Global Environmental Change*, Spring 2009, Spring 2008
- EEOS 115, *Environmental Geology*, Fall 2009, Fall 2008, Fall 2007

SYNERGISTIC ACTIVITIES

CURRENT & RECENT COLLABORATORS

- Bigelow, Nancy, Interim Director, Alaska Quaternary Center
- Brown, Craig, PhD Candidate, University of Edinburgh, School of History, Archaeology
- Crowell, Aron, Director, Smithsonian Institution Arctic Studies Center
- Donnelly, Jeffrey, Tenured Professor, WHOI - Coastal Systems Group
- Kinsman, Nicole, Coastal Hazards Geologist, Alaska Division of Geological and Geophysical Surveys
- Gonnee, Meagan, NSF Postdoctoral Scholar, USGS at WHOI
- Gontz, Allen, Tenured Professor, School for the Environment, University of Massachusetts Boston
- Harris, Bradley, Associate Professor, Alaska Pacific University –FAST Lab
- Hawkes, Andrea, Professor of Coastal Geology, University of North Carolina at Wilmington
- Keigwin, Lloyd, Senior Scientist, Woods Hole Oceanographic Institution's Geology and Geophysics Department
- Mason, Owen, Research Affiliate, INSTAAR, University of Colorado
- Mastone, Victor, State Underwater Archaeologist, Massachusetts Board of Underwater Archeological Resources
- McNichol Ann, Chemist, NOSAMS radiocarbon dating facility
- Suresh Sethi, Biostatistician, USFWS
- Wooller, Matthew, Director, Alaska Stable Isotope Facility

PROFESSIONAL SERVICE

COMMUNITY

- Rocky Mountain School, Goodnews Bay, Alaska public coastal science outreach program 2015
- Marine Science Member, Alaska Quaternary Center Board of Directors
- USGS in partnership with the Mashpee Wampanoag Tribe and WBNERR, *Native Youth in Science – Preserving Our Homelands* program – educational consultant, 2012
- Massachusetts Board of Underwater Archeological Resources – Archeology Fair volunteer, Boston Museum of Science, 2012

INVITED SPEAKER

- *The use of Continuous Flow AMS radiocarbon aging on carbonate shells from areas having preservation potential of cultural resources.* Massachusetts Historic Preservation Conference, October 2013

- *Ancient Forests, Native American Midden Piles, and Climate Change, Native American interaction with dramatic environmental change during the late Holocene.* Massachusetts Archeological Society, December 2012
- *Developing a Paleo-Hurricane Record of Waquoit Bay Massachusetts.* Teachers on the Estuary (TOTE) workshop, Waquoit Bay NERR, June 2011, June 2012
- *Researching the Past to Understand the Future, Sea-Level Rise and a Submerged Ancient Forest,* Waquoit Bay NERR Coffee House Series, Fall 2011, Summer 2012
- *The Battle of Chelsea Creek: GIS recreation of Boston's Historical Landscape* Revere Historical Society, 2011
- *Geophysics and Archaeology,* Boston Museum of Science, Summer 2008
- *Applications of Geophysics in Archaeology,* Paul Revere House, 2008

FIELD TRIPS CONDUCTED

- *Fox Permafrost Tunnel, Alaska.* UAF GEOG 111. 2014-2015
- *Museum of the North, Alaska.* UAF GEOG 111. 2014-2015
- *Poker Flat Research Range, Alaska.* UAF GEOG 339. 2015
- *Field Trips in Environmental Science.* UMass Boston School for the Environment 3 day 1 credit field trips. 2010-2014
- *Geographical and historical evolution of Boston's coastal environment.* National Science Foundation supported Coastal Research in Environmental Science and Technology - Experience for Undergraduates (CREST-REU) program at UMass Boston, July 2012, July 2013
- *Cape Cod paleo-ecosystems.* Waquoit Bay National Estuarine Research Reserve TIDAL Quest: Teens Investigating Diversity of Aquatic Life, July 2013
- *The Story of the Past Yields Clues to the Future,* Woods Hole Oceanographic Institution's Ocean Science Journalism Fellowship program, August 2012

JOURNAL REVIEWER

- Journal of Coastal Research

AFFILIATIONS

- Trimble University Partnership Program
- Alaska Quaternary Center
- Coastal Education and Research Foundation
- Geological Society of America
- American Geophysical Union
- University of Alaska Museum of the North