# Michael J. Polito

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## Education

**Ph.D., Marine Biology** 5/12/2012
*University of North Carolina Wilmington (UNCW)*

**B.S. in Marine Biology** 12/21/2001
*University of North Carolina Wilmington*
Cum laude - Honors in Marine Biology

## Positions Held

**Devonshire Postdoctoral Scholar** 2012-present
*Woods Hole Oceanographic Institute*

**Adjunct Research Faculty** 2012-present
*UNCW, Dept. of Biology and Marine Biology.*

**Biologist** 2005-present
*Oceanites, Inc.* (www.oceanites.org)

**Research Assistant** 2006-2012
*UNCW, Dept. of Biology and Marine Biology.*

**Biological Technician / Field Team Leader / Database Manager** 2003-2006
*NOAA, Southwest Fisheries Science Center, Antarctic Ecosystem Research Division.*

**Biological Technician / Field Team Leader** 2003
*USFWS, Alaska Maritime National Wildlife Refuge.*

**Research Intern** 2002-2003
*PRBO Conservation Science*

**Research Assistant** 2000-2002
*UNCW, Dept. of Biology and Marine Biology.*

## Peer Reviewed Publications

1) **Polito M.J.,** Clucas G.V., Hart T., and Trivelpiece W.Z. 2012 A simplified method of determining the sex of *Pygoscelis* penguins using bill measurements. *Marine Ornithology - In Press*

2) Brasso R.L., **Polito M.J.,** Lynch H.J., Naveen R., and Emslie S.E. 2012. Penguin eggshells reflect homogeneity of mercury in the marine food web surrounding the Antarctic Peninsula *Science of the Total Environment - In Press.*

3) Naveen R., Lynch H.J., Forrest S., Mueller T., and **Polito M.J.** 2012. First, complete site-wide penguin survey at Deception Island, Antarctica reveals massive declines consistent with climate change. *Polar Biology – In Press.*

4) Emslie S.E., **Polito M.J.,** and Patterson W.P. 2012. Stable isotope analysis of ancient and modern gentoo penguin egg membrane supports the krill surplus hypothesis in Antarctica. *Antarctic Science - In Press.*

*5)* **Polito M.J.**, Koopman H.N., Able S., Walsh J., Goebel M.E. 2012. Physiological constraints and the influence of diet on fatty acids in the yolk of gentoo penguins, *Pygoscelis papua*. *Journal of Comparative Physiology B* 182:703-713

6) Hinke J.T., **Polito M.J.,** Reiss C.S., Trivelpiece S.G., and Trivelpiece W.Z. 2012. Flexible reproductive timing can buffer reproductive success of *Pygoscelis* penguins in the Antarctic Peninsula region. *Marine Ecology Progress Series* 454:91-104

7) Raya Rey A., **Polito M.J.,** Archuby D., and Coria N. 2012 Stable isotopes identify age and sex-specific dietary partitioning and foraging habitat segregation in Southern Giant Petrels breeding in Antarctica and southern Patagonia. *Marine Biology* 159:1317-1326

*8)* *Vasil C.A., **Polito M.J.,** Patterson W.P., Emslie S.E. 2012. Wanted: dead or alive? Isotopic analysis ($\delta^{13}C$ and $\delta^{15}N$) of *Pygoscelis* penguin chick tissues support opportunistic sampling. *Rapid Communications in Mass Spectrometry* 26:487-493

*9)* **Polito M.J.,** Trivelpiece W.Z., Karnovsky N.J., Ng E., Patterson W.P., and Emslie S.D. 2011. Integrating stomach content and stable isotope analyses to quantify the diets of pygoscelid penguins. *PLoS ONE,* 6(10):e26642

10) **Polito M.J.,** Lynch H.J., Naveen R., and Emslie S.D. 2011. Stable isotopes reveal regional heterogeneity in the pre-breeding distribution and diets of sympatrically breeding *Pygoscelis* penguins. *Marine Ecology Progress Series* 421:265-277

11) **Polito M.J.,** Abel S., Tobias C.R., and Emslie S.D. 2011. Dietary isotopic discrimination in gentoo penguin (*Pygoscelis papua*) feathers. *Polar Biology* 34:1057–1063

12) Brasso R.L., Abel S., and **Polito M.J.** 2011. Mercury allocation into egg tissues is independent of dietary exposure in Gentoo penguins. *Archives of Environmental Contamination and Toxicology*, doi: I 10.1007/s00244-011-9714-7

13) Sander M., Garcia S.A., Carneiro A.P.B., Cristofoli S.I., and **Polito M.J.** 2011. Band recoveries and juvenile dispersal of Southern Giant-Petrels, *Macronectes giganteus* (Gmelin, 1789), marked as chicks in Antarctica by the Brazilian Antarctic program (1984/1993). *Marine Ornithology* 38:125-127

14) **Polito M.J.,** and Goebel M.E. 2010. Investigating the use of stable isotope analysis of milk to infer seasonal trends in the diets and foraging habitats of female Antarctic fur seals. *Journal of Experimental Marine Biology and Ecology* 395(1-2):1-9

15) **Polito M.J.,** Miller A.K., Trivelpiece S.G., and Trivelpiece W.Z. 2010. Maturation increases early reproductive investment in Adélie Penguins *Pygoscelis adeliae*. *Ibis* 152:38-47

16) Carneiro A.P.B., **Polito M.J.,** Sander M., and Trivelpiece W.Z. 2010. Abundance and Spatial Distribution of Sympatrically Breeding *Catharacta* Spp. (skuas) in Admiralty Bay, King George Island, Antarctica. *Polar Biology* 33(5):673-682

17) **Polito M.J.,** Fisher S., Tobias C.R., and Emslie, S.D. 2009. Tissue-specific isotopic discrimination factors in gentoo penguin (*Pygoscelis papua*) egg components: Implications for dietary reconstructions using stable isotopes. *Journal of Experimental Marine Biology and Ecology* 372:106-112

18) *Strickland M.E., **Polito M.J.,** and Emslie, S.D. 2008. Spatial and seasonal variation in Adélie penguin diets as inferred from stable isotope analysis of eggshell. *Journal of the North Carolina Academy of Science*, 124(3):65-71

19) **Polito M.J.,** and Trivelpiece, W.Z. 2008. Transition to independence and evidence of extended parental care in the gentoo penguin (*Pygoscelis papua*). *Marine Biology*, 154(2): 231-240

20) Sander M., Balbão T.C., **Polito M.J.,** Costa E.S., and Carneiro, A.P.B. 2007. Recent decrease in chinstrap penguin (*Pygoscelis antarctica*) populations at two of Admiralty Bay's Islets on King George Island, South Shetland Islands, Antarctica. *Polar Biology* 30(5):659-661

21) Emslie, S.D., Berkman P.A., Ainley D. G., Coats, L., and **Polito, M.** 2003. Late-Holocene initiation of ice-free ecosystems in the Southern Ross Sea, Antarctica. *Marine Ecology Progress Series* 262:19-25

22) **Polito M.,** Emslie S.D., and Walker, W. 2002. A 1,000–year record of Adélie penguin diets in the Southern Ross Sea, Antarctica. *Antarctic Science*, 14 (4):327–332

## Publications Submitted / In Prep

1) **Polito M.J.,** Reise C.S., Trivelpiece W.Z., Patterson W.P., and Emslie S.D. *With Co-Authors*. Ontogenetic niche expansion and oceanographic factors affect the stable isotope signatures of the Antarctic krill (*Euphausia superba*). *To be submitted to Marine Biology*

2) **Polito M.J.,** Trivelpiece W.Z., Trivelpiece S.G., Patterson W.P., and Emslie S.D. *In Prep*. Sympatrically breeding *Pygoscelis* penguins balance niche plasticity and ecological segregation under variable environmental conditions. *To be submitted to Oecologica*

3) **Polito M.J.** Brasso R.L., Trivelpiece W.Z., Patterson W.P., Emslie S.E. *In Prep*. Divergent foraging strategies influence mercury exposure in sympatrically breeding *Pygoscelis* penguins. *To be submitted to Ecotoxicology*

## Technical Reports

1) **Polito M.J.,** and Drew, E.K. 2003. Results of Seabird Monitoring at St. Paul Island, Alaska in 2003: Summary Appendices. U.S. Fish and Wildl. Serv. Rep., AMNWR 03/11

## Funding Received

**American Ornithologists' Union Research Grant, 2011** ($2,493)
"Oxidative Stress and Life History Trade-Offs in Penguins."

**Sigma Xi Grants-in-Aid of Research, 2011** ($400)
"Oxidative Stress and Sexual Signaling in Gentoo Penguins."

**The Company of Biologist Direct Travel Grant, 2010** (£250)
To attend the 2010 Stable Isotopes in Ecology Summer Course at the University of Utah, Salt Lake City

**National Science Foundation, Office of Polar Programs, 2008** ($503,195)
"Stable Isotope Analyses of Pygoscelid Penguin Remains from Active and Abandoned Colonies in Antarctica." (Co-PI)

**Dr. Ralph W. Brauer Fellowship, UNCW, 2007** ($1,000)
"Tissue-specific dietary isotopic fractionation in captive *Pygoscelis* penguins"

**Dr. Ralph W. Brauer Fellowship, UNCW, 2006** ($1,000)
"Characterizing the stable isotope signature of *Pygoscelis* penguin prey species"

**National Science Foundation, Office of Polar Programs, Travel Grant, 2005** ($2,000)
To attend the Scientific Committee on Antarctic Research (SCAR) Biology Symposium. Curitiba, Brazil.

## First Author Research Presentations

1) **Polito M.J.,** Lynch H.J., Naveen R., and Emslie S.D. 2010. Stable isotopes reveal regional heterogeneity in the pre-breeding distribution and diets of sympatrically breeding *Pygoscelis* penguins. (Oral presentation) *1st World Seabird Conference, Victoria, Canada and 7th International Penguin Conference, Boston, USA*

2) **Polito M.J.**, Koopman H.N., Able S., Walsh J., Goebel M.E. 2010. The influence of diet on fatty acids in the yolk of gentoo penguins, *Pygoscelis papua*. (Poster presentation) *1st World Seabird Conference, Victoria, Canada and 7th International Penguin Conference, Boston, USA*

*3)* **Polito M.J.,** Trivelpiece S.G., Trivelpiece W.Z., and Emslie S.D. 2009. Inter-annual variation in the pre-breeding diets of the Adélie penguin (*Pygoscelis adeliae*) as estimated from stable isotope analysis of eggshell (Poster presentation) *Scientific Committee on Antarctic Research (SCAR) Biology Symposium, Sapporo, Japan*

4) **Polito M.J.,** Miller A.K., Trivelpiece S.G., and Trivelpiece W.Z. 2009. Maturation increases early reproductive investment in Adélie Penguins *Pygoscelis adeliae*. (Oral presentation) *UNCW Darwin's Legacy Conference: Evolution's Impact on Science and Culture, Wilmington, NC, USA*

5) **Polito M.J.,** and Trivelpiece W.Z. 2008. Effects of female age, breeding experience and laying date on clutch and egg size in the Adélie penguin (*Pygoscelis adeliae*). (Oral presentation) *Duke University Marine Lab Graduate Student Research Symposium, Duke University Marine Lab, Beaufort, NC, USA*

6) **Polito M.J.,** Strickland M.E., and Emslie, S.D. 2007. Temporal variation in resource utilization in *Pygoscelis* penguins as inferred from stable isotope analysis. (Poster presentation) *Waterbirds Society Meeting, Barcelona, Spain*

7) **Polito M.J.,** and Trivelpiece W.Z. 2006. Development of foraging behavior and evidence of extended parental care in the gentoo penguin (*Pygoscelis papua*). (Oral presentation) *Duke University Marine Lab Graduate Student Research Symposium, Duke University Marine Lab, Beaufort, NC, USA*

8) **Polito M.J.,** and Trivelpiece W.Z. 2005. Fledging behavior of gentoo penguins (*Pygoscelis papua*) at Admiralty Bay, King George Island, Antarctic Peninsula. (Poster presentation) *International Polar Meeting, German Society of Polar Research, Jena, Germany*

9) **Polito M.J.,** Burgo Braga R., Dani N., and Trivelpiece W.Z **.** 2005 Digital spatial data collection of penguin colonies on western shore of Admiralty Bay (ASPA 128), King George Island, Antarctic Peninsula. (Poster presentation) *Scientific Committee on Antarctic Research (SCAR) Biology Symposium. Curitiba, Brazil*

10) **Polito M.,** Emslie S.D., and Walker, W. 2002. A 1,000-year record of Adélie penguin diets in the Southern Ross Sea, Antarctica. (Poster presentation) *The Pacific Seabird Group (PSG) Symposium. Parksville, BC, Canada*

11) **Polito M.,** Emslie S.D., and Walker, W. 2001. Diet of Adélie penguins at Ross Island, Antarctica. (Poster presentation) *Scientific Committee on Antarctic Research (SCAR) Biology Symposium. Amsterdam, The Netherlands*

## Mentoring Experience

**Undergraduate Research Mentor** 2006-present
*UNCW, Dept. of Biology and Marine Biology.*
Co-mentors with faculty advisor four undergraduate students. Trains students in experimental design, data collection, analysis and the preparation of research papers and presentations. Resulted in two undergraduate-led, peer-review publications (noted above with *).

**Stable Isotope Mass Spectrometry Laboratory Assistant** 2008-present
*UNCW, Center for Marine Science.*
Trains undergraduate, graduate and post-doctoral researchers in project design, sample preparation, analysis and interpretation of stable isotope data for their research programs.

## Analytical Expertise

**Stable Isotope Mass Spectrometry**
Experienced in the use, general maintenance and repair of continuous flow-isotope ratio mass spectrometers (Thermo Delta V Plus) and peripheral devices (Costech ECS4010 elemental analyzer and Thermo Gas Bench II) and software (Isodat) for the analysis of nitrogen and carbon isotopes in solid samples, carbon and oxygen isotopes in carbonates. Attended the *Stable Isotopes in Ecology Summer Course* at the University of Utah in 2010.

**Fatty Acid Analysis**
Experienced in the chemical lipid extraction, derivatization and analysis of fatty acids via gas chromatography (Varian CP-3800 gas chromatograph flame ionization detector).

**Mercury Analysis**
Experienced with the use and general maintenance of a Direct Mercury Analyzer (DMA-80, Milestone) for the analysis of total mercury of solid and liquid organic samples.

**Geospatial, Statistical and Quantitative Software**
- ArcGIS (ver. 9.2)
- SAS (ver. 9.1) and SPSS (ver. 16) for statistical analysis.
- R (ver. 2.13) for statistical analysis, ecological modeling and Bayesian mixing model analyses for dietary, trophic and food-web studies using stable isotope data (SIAR, ver. 4.1)
- PRIMER (ver. 6) for non-parametric analysis of multivariate ecological and fatty acid data.

## Teaching: Courses

**Graduate Teaching Assistant – Introductory Cell Biology** 2006-2008
*UNCW, Dept. of Biology and Marine Biology.*
Principle instructor for undergraduate introductory Cell Biology laboratory courses (four semesters, one to three 25-student sections per semester).

**Graduate Teaching Assistant – Marine Biology** 2007
*UNCW, Dept. of Biology and Marine Biology.*
Principle instructor for upper level Marine Biology laboratory courses (one semester, two 25-student sections).

**Biologist Educator - Antarctic Biology** 2005-present
*Oceanites, Inc.* (www.oceanites.org)
Lectures commercial tour ship visitors to Antarctica on multiple topics including: "Antarctic Seabirds", "Life at Antarctic Research Stations" and "Antarctic Penguins and Climate Change."

## Teaching: Invited Lectures

**2011 -** *UNCW, Honors Survey of Biological Research Course*: "Stable Isotope Ecology"
**2010 -** *UNCW, Upper Level Ecology Course*: "Marine & Aquatic Systems" (2 lectures)
**2008-2011 -** *Gregory Elementary School, NC, 2nd grade*: "Antarctic Penguins" (3 classes/year)
**2005 -** *Universidade do Vale do Rio dos Sinos, Brazil, Ornithology Course*: "Birds of Antarctica"

## Awards Received

**Highly Commended Student Paper Award -** 1st World Seabird Conference, 2010
**Outstanding Teaching Assistant Nominee -** UNCW Biology Department, 2008
**Paper Presentation Award (3rd place) -** Duke Marine Lab Graduate Research Symposium, 2008
**Lacy C. and Doris L. Sidbury Graduate Fellowship -** UNCW, 2006
**Paper Presentation Award (2rd place) -** Duke Marine Lab Graduate Research Symposium, 2006
**Undergraduate Departmental Honors Program -** UNCW, 1997-2001

## Professional Services

**Invited Reviewer**: Canadian Journal of Zoology, Ibis, Journal of Comparative Physiology - B, Journal of Field Ornithology, Neotropical Biology & Conservation, Nature (reader panel), Proceeding of the Royal Society - B, PLoS One, Marine Ecology Progress Series, Rapid Communications in Mass Spectrometry

**Active Member:** American Geophysical Union, American Ornithologist Union, Association of Polar Early Career Scientists

**Representative:** UNCW Graduate Student Association President (2010-11), UNCW Biology & Marine Biology Graduate Advisory Committee (2008)