

Dr. M. Tim Tinker, Research Biologist, USGS

Curriculum Vitae

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Academic Record

University of California, Santa Cruz, CA

PhD Ecology and Evolutionary Biology, 1998-2004

Dissertation Research: Population biology and foraging behavior of the southern sea otter

University of Waterloo, Ontario, Canada

M.Sc., Biology, 1991-1993

Thesis: Behavioral ecology and energetics of grey seals (*Halichoerus grypus*) on land-fast ice

University of Guelph, Ontario, Canada

Honors B.Sc., Zoology, 1986-1990

Specialization: Wildlife Biology

Professional Appointments

- Research Scientist, US Geological Survey, Western Ecological Research Center, 2008 -
- Associate Adjunct Professor, UC Santa Cruz, Ecology and Evolutionary Biology, 2008 -
- Assistant Research Biologist, UC Santa Cruz, Ecology and Evolutionary Biology, 2007-2008
- Post-doctoral researcher, UC Santa Cruz, Ecology and Evolutionary Biology, 2004-2007

Primary Publications

Breed, G. A., E. A. Golson and M. T. Tinker. *In press*. Predicting animal home range structure and transitions using a multistate Ornstein-Uhlenbeck biased random walk. *Ecology*

Tinker, M.T., and Hatfield, B.B., 2016, California sea otter (*Enhydra lutris nereis*) census results, spring 2016: U.S. Geological Survey Data Series 1018, 10 p., <http://dx.doi.org/10.3133/ds1018>.

Schott, K.C., Krusor, C., Tinker, M.T., Moore, J., Conrad, P.A., Shapiro, K., 2016. Concentration and retention of *Toxoplasma gondii* surrogates from seawater by red abalone (*Haliotis rufescens*). *Journal of Parasitology*, 143(13):1703-1712.

Thometz, N.M., Staedler, M.M., Tomoleoni, J.A., Bodkin, J.L., Bental, G.B., Tinker, M.T., 2016. Trade-offs between energy maximization and parental care in a central place forager, the sea otter. *Behavioral Ecology*, 27(5): 1552-1566

Novak, M., J.D. Yeakel, A.E. Noble, D.F. Doak, M. Emmerson, J.A. Estes, U. Jacob, M.T. Tinker and J.T. Wootton. *In press*. Characterizing species interactions to understand press perturbations: What is the community matrix? *Annual Review of Ecology, Evolution and Systematics*, 47(1)

Tinker, M.T., Staedler, M.M., Tarjan, L.M., Bental, G.B., Tomoleoni, J.A., and LaRoche, N.L., 2016, Geospatial data collected from tagged sea otters in central California, 1998-2012: U.S Geological Survey data release, <http://www.dx.doi.org/10.5066/F76H4FH8>.

Tarjan, L.M., and M. T. Tinker. 2016. Permissible Home Range Estimation (PHRE) in Restricted Habitats: A New Algorithm and an Evaluation for Sea Otters. *PLoS One*, <http://dx.doi.org/10.1371/journal.pone.0150547>

Chinn, S. M., M. A. Miller, M. T. Tinker, M. M. Staedler, F. I. Batac, E. M. Dodd, L. A. Henkel. 2016. The High Cost of Motherhood: End-Lactation Syndrome in Southern Sea Otters. *Journal of Wildlife Diseases*, 52(2):307-318. doi: 10.7589/2015-06-158

Tinker, M. Tim, and B. B. Hatfield. 2015. Southwest U.S. Southern sea otter annual range-wide census results: U.S. Geological Survey Data Release, <http://dx.doi.org/10.5066/F7F47M5C>

Tinker, M.T., B. B. Hatfield, M. D. Harris, and J. A. Ames. 2015. Dramatic Increase in Sea Otter Mortality from White Sharks in California. *Marine Mammal Science*, 32(1): 309–326,

Krusor, C., W. A. Smith, M. T. Tinker, M. Silver, P. A. Conrad, and K. Shapiro. 2015. Concentration and retention of *Toxoplasma gondii* oocysts by marine snails demonstrate a novel mechanism for transmission of terrestrial zoonotic pathogens in coastal ecosystems. *Environmental Microbiology*. 17(11):4527-37

Raimondi, P., L.J. Jurgens, and M.T. Tinker. 2015 Evaluating potential conservation conflicts between two listed species: sea otters and black abalone. *Ecology* 96: 3102-3108

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- Novak, M. and M.T. Tinker. 2015. Time-scales alter the inferred strength and temporal consistency of intraspecific diet specialization. *Oecologia* 178:61–74.
- Newsome, S.D., M.T. Tinker, V.A. Gill, Z.N. Hoyt, A. Doroff, L. Nichol, and J.L. Bodkin. 2015. The interaction of intraspecific competition and habitat on individual diet specialization: a near range-wide examination of sea otters. *Oecologia*, 178: 45-59
- Smith, E.A.E., S.D. Newsome, J.A. Estes and M.T. Tinker. 2015. The cost of reproduction: differential resource specialization in female and male California sea otters. *Oecologia*, 178:17-29
- Fujii, J. A., K. Ralls, and M. T. Tinker. 2015. Ecological drivers of variation in tool-use frequency across sea otter populations. *Behavioral Ecology*, 26(2) 519-526
- Stewart, N.A., B. Konar and M.T. Tinker 2015. Testing the nutritional limitation and predator avoidance hypotheses for restricted sea otter habitat use in the Aleutian Islands, Alaska. *Oecologia*, 177(3):645–655
- Beas-Luna, R., M. Novak, M. H. Carr, M. T. Tinker, A. Black, J. E. Caselle, M. Hoban, D. Malone, and A. Iles. 2014. An online database for informing ecological network models: <http://kelpforest.ucsc.edu> . *PLoS ONE* 9(10): e109356
- Tinker, M.T. 2014. “Models and Sea Otter Conservation”. Chapter 10 *In* S. Larson, G. VanBlaricom and J. Bodkin, editors, “Sea Otter Conservation”, Elsevier, Inc., NY
- Bowen, L., A. K. Miles, C. A. Kolden, J. A. Saarinen, J. L. Bodkin, M. J. Murray, and M. T. Tinker. 2014. Effects of wildfire on sea otter (*Enhydra lutris*) gene transcript profiles. *Marine Mammal Science*, 31(1):191–210
- Lafferty, K.D. and Tinker, M.T. 2014. Sea otters are recolonizing southern California in fits and starts. *Ecosphere* (Ecological Society of America) 5:art50
- Thometz, N. M, Tinker, M. T., Staedler, M.M., Mayer, K.A., and Williams, T.M. 2014. Energetic Demands of Immature Sea Otters from Birth to Weaning: Implications for maternal costs, reproductive behavior, and population level trends. *Journal of Experimental Biology* 217, 2053-2061
- Kenner, M. C., J. A. Estes, M. T. Tinker, J. L. Bodkin, R. K. Cowen, C. Harrold, B. B. Hatfield, M. Novak, A. Rassweiler, and D. C. Reed. 2013. A multi-decade time series of kelp forest community structure at San Nicolas Island, California. *Ecology* 94:2654–2654. <http://dx.doi.org/10.1890/13-0561R.1>
- Hughes, B. B., R. Eby, E. Van Dyke, M. T. Tinker, C. I. Marks, K. S. Johnson, and K. Wasson. 2013. Recovery of a top predator mediates negative eutrophic effects on seagrass. *Proceedings of the National Academy of Sciences*, doi:10.1073/pnas.1302805110
- Oates, S.C., Miller, M.A., Hardin, D., Conrad, P.A., Melli, A., Jessup, D.A., Dominik, C., Roug, A., Tinker, M.T., Miller, W.A. 2012. Prevalence, Environmental Loading, and Molecular Characterization of Cryptosporidium and Giardia Isolates from Domestic and Wild Animals along the Central California Coast. *Applied and Environmental Microbiology*. 78(24): 8762–8772
- Tinker M.T., Guimarães P.R., Novak M., Marquitti F.M.D., L. B.J., Staedler M., Bentall G. & A. E.J. 2012. Structure and mechanism of diet specialization: testing models of individual variation in resource use with sea otters. *Ecology Letters* 15(5) 475-483.
- Bowen L., Miles A.K., Murray M., Haulena M., Tuttle J., Van Bonn W., Adams L., Bodkin J.L., Ballachey B., Estes J., Tinker M.T., Keister R. & Stott J.L. 2012. Gene transcription in sea otters (*Enhydra lutris*); development of a diagnostic tool for sea otter and ecosystem health. *Molecular Ecology Resources*, 12, 67-74.
- Kim SL, Tinker MT, Estes JA, Koch PL (2012) Ontogenetic and Among-Individual Variation in Foraging Strategies of Northeast Pacific White Sharks Based on Stable Isotope Analysis. *PLoS ONE* 7(9): e45068. doi:10.1371/journal.pone.0045068
- Newsome, Seth D., Justin D. Yeakel, Patrick V. Wheatley, M. Tim Tinker. 2012. Tools for quantifying isotopic niche space and dietary variation at the individual and population level. *Journal of Mammalogy*.93(2), 329-341

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- Hatfield, B.B., Ames, J.A., Estes, J.A., Tinker, M.T., Johnson, A.B., Staedler, M.M., and Harris, M.D. 2011. Sea otter mortality in fish and shellfish traps: estimating potential impacts and exploring possible solutions. *Endangered Species Research*, 13(3): 219-229.
- Novak M, J.T. Wootton, D.F. Doak, M. Emmerson, J.A. Estes, M.T. Tinker. 2011. Predicting community responses to perturbations in the face of imperfect knowledge and network complexity. *Ecology* 92:836–846
- Harris, Heather S., Stori C. Oates, Michelle M. Staedler, M. Tim Tinker, David A. Jessup, James T. Harvey, and Melissa A. Miller. 2010. Behavior Associated with Forced Copulation of Juvenile Pacific Harbor Seals (*Phoca vitulina richardsi*) by Southern Sea Otters (*Enhydra lutris nereis*). *Aquatic Mammals* 36(4): 219-229
- Miller MA, Kudela RM, Mekebri A, Crane D, Oates SC, M. Tim Tinker, et al. 2010 Evidence for a Novel Marine Harmful Algal Bloom: Cyanotoxin (Microcystin) Transfer from Land to Sea Otters. *PLoS ONE* 5(9): e12576.
- Conrad, P. A., E. VanWormer, K. Shapiro, M. Miller, C. Kreuder-Johnson, T. Tinker, M. Grigg, J. Largier, T. Carpenter, and J. K. Mazet. 2009. TRACKING TOXOPLASMA GONDII FROM LAND TO SEA. *American Journal of Tropical Medicine and Hygiene* 81:198-198.
- Jessup, D.A., C. Kreuder-Johnson, J.A. Estes, D. Carlson-Bremer, W.M. Jarmin, S. Reese, E. Dodd, M.T. Tinker, and M.H. Ziccardi. 2010. Persistent organic pollutants in the blood of free ranging sea otters (*Enhydra lutris* sp.) in Alaska and California. *Journal of Wildlife Diseases*, 46(4):1-20
- Newsome, S.D., G.B. Bentall, M.T. Tinker, O.T. Oftedal, K. Ralls, M.L. Fogel, and J.A. Estes. 2010. Variation in $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ diet-vibrissae trophic discrimination factors in a wild population of California sea otters (*Enhydra lutris nereis*). *Ecological Applications* 20(6):1744-1752
- Estes, J.A., M.T. Tinker, and J.L. Bodkin. 2010. Using ecological function to develop recovery criteria for depleted species: Sea otters and kelp forests in the Aleutian Archipelago. *Conservation Biology* 24(3): 852-860
- Tinker, M. T., M. Mangel, and J. A. Estes. 2009. Learning to be different: acquired skills, social learning, frequency dependence and environmental variation can cause behaviorally-mediated foraging specializations. *Evolutionary Ecology Research*, 11: 841-869
- Edwards, M. S., and M. T. Tinker. 2009. Monitoring Benthic Algal Communities: A Comparison of Targeted and Coefficient Sampling Methods. *Algae* 24(2):111-120.
- Newsome, S.D., M.T. Tinker, D.H. Monson, O.T. Oftedal, K. Ralls, M. Staedler, M.L. Fogel, and J.A. Estes. 2009. Using stable isotopes to investigate individual diet specialization in California sea otters (*Enhydra lutris nereis*). *Ecology* 90: 961-974.
- Johnson, C.K., Tinker, M.T., Estes, J.A., Conrad, P.A., Staedler, M., Miller, M.A., Jessup, D.A. and Mazet, J.A.K. 2009. Prey choice and habitat use drive sea otter pathogen exposure in a resource-limited coastal system. *Proceedings of the National Academy of Sciences* 106(7): 2242-2247.
- Tinker, M. T., D. F. Doak, and J. A. Estes. 2008. Using demography and movement behavior to predict range expansion of the southern sea otter. *Ecological Applications* 18(7) 1781-1794.
- Peckham, S.H., D. Maldonado Diaz, V. Koch, A. Mancini, A. Gaos, M. T. Tinker, W.J. Nichols. 2008. High mortality of loggerhead turtles due to bycatch, human consumption and strandings at Baja California Sur, Mexico, 2003 to 2007. *Endangered Species Research* 5(2-3).
- Tinker, M.T., J.A. Estes and G. Bentall. 2008. Food limitation leads to behavioral diversification and dietary specialization in sea otters. *Proceedings of the National Academy of Sciences* 105(2) 560-565
- Doak, D.F., J.A. Estes, B.S. Halpern, U. Jacob, D.R. Lindberg, J.R. Lovvorn, D.H. Monson, M.T. Tinker, et al. 2008. Understanding and predicting ecological dynamics: are major surprises inevitable? *Ecology* 89:952-961.
- Jessup, D.A., M.A. Miller, C. Kreuder-Johnson, P. Conrad, M.T. Tinker, J.A. Estes and J.A.K. Mazet. 2007. Sea Otters in a Dirty Ocean. *Journal of the American Veterinary Medical Association* 231(11): 1648-1652

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- Tinker, M.T., D.P. Costa, J.A. Estes and N. Wieringa. 2007. Individual dietary specialization and dive behaviour in the California sea otter: using archival time-depth data to detect alternative foraging strategies. *Deep Sea Research II* 54:330-342.
- Tinker, M.T., D.F. Doak, J.A. Estes, B.B. Hatfield, M.M. Staedler, and J.L. Bodkin. 2006. Incorporating diverse data and realistic complexity into demographic estimation procedures: a case study using the California sea otter, *Enhydra lutris nereis*. *Ecological Applications* 16:2293-2312.
- Laidre, K.L., J.A. Estes, M.T. Tinker, J. Bodkin, D. Monson and K. Schneider. 2006. Patterns of growth and body condition in sea otters from the Aleutian archipelago before and after the recent population decline. *Journal of Animal Ecology* 75: 978-989
- Estes, J.A., M.T. Tinker, A.M. Doroff and D.M. Burn. 2005. Continuing sea otter population declines in the Aleutian Archipelago. *Marine Mammal Science* 21:169–172.
- Gerber, L.R., M.T. Tinker, J.A. Estes, D.F. Doak and D. Jessup. 2004. Mortality sensitivity in life-stage simulation analysis: A case study of southern sea otters. *Ecological Applications*, 14:1554–1565.
- Estes, J.A., E.M. Danner, D.F. Doak, B. Konar, A.M. Springer, P.D. Steinberg, M.T. Tinker, and T.M. Williams. 2003. Complex trophic interactions in kelp forest ecosystems. *Bulletin of Marine Science*, 74: 621-638.
- Burn, D.M., A.M. Doroff and M.T. Tinker, 2003. Carrying Capacity and pre-decline abundance of sea otters (*Enhydra lutris kenyoni*) in the Aleutian Islands. *Northwestern Naturalist* 84(3): 145-148
- Doroff, A.M., J.A. Estes, M.T. Tinker, D.M. Burn and T.J. Evans. 2003. Sea otter population declines in the Aleutian Archipelago. *Journal of Mammalogy*, 84(1): 55-64
- Estes, J.A., M.L. Riedman, M.M. Staedler M.T. Tinker, B.E. Lyon. 2003. Individual variation in prey selection by sea otters: patterns, causes, and implications. *Journal of Animal Ecology*, 72(1): 144-155
- Estes, J.A., M.T. Tinker, T.M. Williams, D.F. Doak. 1998. Killer whale predation on sea otters links oceanic and nearshore ecosystems. *Science*, 282: 473-476
- Hatfield, B.H., D. Marks, M.T. Tinker, K. Nolan, J. Pierce. 1998. Attacks on sea otters by killer whales. *Marine Mammal Science* 14(4): 888-894.
- Estes, J.A., D.F. Doak, J.R. Bodkin, R.J. Jameson, D. Monson, J. Watt, M.T. Tinker. 1996. Comparative Demography of Sea Otter Populations. *Endangered Species Update* 13(12): 11-13
- Watt, J.P., B.T. Krausse, M.T. Tinker. 1995. Bald Eagles kleptoparasitizing sea otters at Amchitka Island, Alaska. *Condor* 97(2): 588-590
- Tinker, M.T., K.M. Kovacs, M.O. Hammill. 1995. Behavior and energetics of male gray seals (*Halichoerus grypus*) breeding on landfast ice. *Behavioral Ecology & Sociobiology* 36:159-170

Professional Activities

Research Positions:

- 2008- present: Principal Investigator, USGS Santa Cruz Field Station of the Western Ecological Research Center. Lead scientist in studies of sea otter population biology and near-shore ecology
- 2000-2007: Co-Principle Investigator for long-term, telemetry-based study of sea otter demography and foraging ecology in California. Supervisor: Dr. James Estes

Teaching Positions

Courses Taught:

- Quantitative Ecology (BioE 148): Upper level undergraduate/graduate course on quantitative methods of analysis and modeling in ecology. UC Santa Cruz, CA, Spring 2010, 2012, 2014, 2015
- Readings in Ecology (BioE 293): Core Graduate Course in Ecology and Evolutionary Biology, UC Santa Cruz, CA, 2008
- Regular Guest Lectures for UCSC courses: Kelp forest Ecology, Ecology of Marine Mammals, Disease Ecology, Conservation Biology, Field Methods in Biology, Community Ecology

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Graduate Students Advised

- Sarah Espinosa M.Sc. student, UCSC
- Sarah McKay-Strobel, Ph.D. student, UCSC
- Kat Dale, Ph.D. student, UCSC
- Lily Tarjan, Ph.D. graduate, UCSC
- Ben Weitzman, M.Sc. graduate, UCSC
- Jessica Fujii, M.Sc. graduate, UCSC
- Holly MacCormick, M.Sc. graduate, UCSC
- Michelle Staedler, M.Sc. graduate, UCSC
- Lillian Carswell, M.Sc. graduate, UCSC
- Gena Bentall, M.Sc. graduate, UCSC

Graduate Student Committee Memberships

- Rodrigo Beas, Ph.D. student, UCSC
- Robin Dunkin, Ph.D. student, UCSC
- Jason Hassrick, Ph.D. student, UCSC
- Kristen McCully, M.Sc. student, UCSC
- Kim Brewitt, Ph.D. student, UCSC
- Nicole Thometz, Ph.D. student, UCSC
- Justine Smith, PhD student, UCSC
- Zach Hoyt, Ph.D. student, UA-Juneau
- Zach Randell, Ph.D. student, OSU
- Joseph Stewart, PhD student, UCSC
- Chris Law, PhD student, UCSC
- Erin Rechsteiner, PhD student, U Victoria
- Wendel Raymond, Ph.D. student, UA-Juneau
- Nathan Stewart, Ph.D. student, UAF
- Jessica Hale, PhD student, U. Washington
- Jackie Lindsey, Masters Student, MLML
- Emily Golson, Masters Student, MLML
- Ben Weitzman, PhD student, UAF
- Mary Young, Ph.D. student, UCSC
- Megan Moriarty, PhD Student, UC Davis
- Tracy Grimes, M.Sc. student, San Diego State University
- Tristan Burgess, PhD Student, UC Davis

Post Doctoral Students Advised or Co-Advised

- Dr. Mark Novak, UCSC, 2011-13
- Dr. Melissa Monk, UCSC, 2013-14
- Dr. Brent Hughes, UCSC, 2014-16

Workgroup and Committee Memberships:

- Invited panelist for international symposium and review of tool-use in non-human animals, convened by University of Oxford, UK, August, 2015
- Invited expert reviewer and participant in Marine Mammal Research Program Review by Canadian Department of Fisheries and Oceans, Ottawa, Ontario, Canada, October 2014
- Invited expert panelist on Alaska Sea Grant and University of Alaska Fairbanks sponsored outreach forum to Alaskan communities to discuss sea otter – human interactions. Juneau, Alaska, May, 2014
- Invited expert panelist and participant in Canadian workshop to review ecological and social impacts of sea otter recovery, sponsored by Pew Fellowships. British Columbia, Canada, June 2014.
- Invited expert panelist for US Fish and Wildlife Service and University of Alaska Fairbanks Symposium on southeast Alaska sea otter recovery, Juneau, Alaska, February, 2013
- Invited expert witness for the black abalone recovery team (NMFS), August 2013
- Invited expert witness for hearings convened by the Federal Marine Mammal Commission (June 2013)
- Member of Southwest Alaska Sea Otter Recovery Team (SWAKSORT) convened by US FWS
- Invited participant, Marine Mammal Commission symposium to advise on the use of population viability analysis in marine mammal populations. Savannah, GA, Sept 2005 (report requested by US Congress)
- Invited participant, Marine Mammal Commission symposium to determine the ecological role of killer whales in the north Pacific. Seattle, WA, Apr. 2005 (report requested by US Congress)
- Invited participant, US Fish and Wildlife Service workshop to develop long-term monitoring plan for sea otters in south-west Alaska. Anchorage, AK, Feb. 2005.
- Invited participant, Alaska Sea Life Center/US Fish and Wildlife Service symposium to determine research priorities for the sea otter in south-west Alaska. Seward, AK, Apr. 2004.
- Invited participant, US Fish and Wildlife Service workshop to study sea otter decline in south-west Alaska. Anchorage, AK, Apr. 2002.
- Invited participant, National Center for Ecological Analysis and Synthesis working group on Ecosystem Based Management: Investigating the Roles of Top Predators, 2004-2007

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Professional Society Memberships:

- Member of The Society for Marine Mammalogy, 1991-present
- Member of the Ecological Society of America, 2005-present

Journal Reviews and Editing

- Subject Editor, Ecological Applications (Nov 2013)
- Manuscript Reviews provided regularly (5-15 per year) for the following journals:
 - The American Naturalist
 - Ecology
 - Ecological Applications
 - Marine Mammal Science
 - Proceedings of the Royal Society
 - Journal of Animal Ecology
 - Can. J. Fisheries and Aquatic Science
 - Journal of Wildlife Management
 - Trends in Ecology and Evolution
 - Marine Biology
 - Oecologia
 - Animal Behavior
 - Population Ecology
 - Oikos
 - Marine Ecology Progress Series
 - Behavioral Ecology
 - Journal of Sea Research
 - Ecography
 - PLOS One
 - Proceedings of the National Academy of Science (PNAS)

Special Certifications and continued Professional Training:

- Completed Bayesian Statistics workshop, USGS-WERC, 2010: Bayesian inference for environmental scientists, ecologists and wildlife biologists
- Certified DOI Motorboat Operator (MOCC)
- First Aid/CPR certified (current) and trained in Wilderness First Aid

Grants, Awards and Scholarships

- National Science Foundation, 'Kelp forest community resilience in action' (co-PI, 2015-2018)
- Aleutian Bering Sea Islands LCC, 'Assessing effects of climate change and ocean acidification on sea urchin productivity and trophic interactions in the Aleutian Islands: Consequences for sea otter recovery' (PI, 2015-2016)
- US Navy, 'Sub-tidal Community Monitoring, San Nicolas Island' (PI, 2014-2015)
- US Fish and Wildlife Service, 'Aleutian Sea Otter Hot Spot Analysis' (PI, 2014-2014)
- California Coastal Conservancy, 'Sea Otter Habitat Use and Biology in Elkhorn Slough' (PI, 2013-2016)
- Oiled Wildlife Care Network, 'Developing a Network-based Tag for Sea Otter Monitoring' (PI, 2013-2016)
- US Fish and Wildlife Service, 'Sea Otter Ecology in Elkhorn Slough' (PI, 2013-2015)
- US Fish and Wildlife Service, 'Sea Otter Movements and Habitat Use' (PI, 2013-2014)
- US Fish and Wildlife Service, 'Sea Otter Population Analysis, SE Alaska' (PI, 2013-2014)
- Pacific Gas and Electric, 'Effects on Sea Otters of Seismic Surveys and Other Stressors' (PI, 2012-2014)
- US Fish and Wildlife Service, 'Modeling Sea Otter Range Expansion' (PI, 2012-2013)
- California Coastal Conservancy, 'Effect of Sea Otter Stressors, Big Sur and Monterey comparison' (PI, 2011-2013)
- Department of Interior, 'Coastal Ecosystem Responses to Stressors from Land and Sea' (co-PI, 2010-2015)
- Bureau of Ocean Energy Management, 'Sea Otter Range Expansion in Southern California' (PI, 2010-2014)
- UC Davis/NSF, 'transmission dynamics of Toxoplasma gondii at the land-sea Interface' (co-PI, 2010-2013)
- Alaska Sea Life Center, 'Report on Commander Island sea otter survey' (PI, 2010-2010)
- US Fish and Wildlife Service, 'Sea Otter Population Viability Analysis' (PI, 2009-2010)
- US Fish and Wildlife Service, 'Stressors Affecting Sea Otter Populations' (PI, 2008-2010)
- NPRB, 'NPRB Project 717, Causes of sea otter decline in SW Alaska' (co-PI, 2007-2010)

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- UCSB MMS Coastal Marine Institute, 'Population Biology of Sea Otters at the South of their Range' (co-PI, 2000-2003)
- Research Grant from Friends of the Sea Otter: Development of a Spatially Explicit Population Model for the Southern Sea Otter, 2000
- Departmental Graduate Fellowship, Ecology and Evolutionary Biology Dept., UC Santa Cruz, 1998

Professional Technical Reports:

- Tinker, M. T. et al., 2015. "Sea Otter Range Expansion and Habitat Use in the Santa Barbara Channel." Draft Final Report to the Bureau of Ocean Energy Management. US Geological Survey Project Report, 88 pages
- Tinker, M. T., et al., 2013. "Sea Otter Population Biology at Big Sur and Monterey California: Investigating the Consequences of Resource Abundance and Anthropogenic Stressors for Sea Otter Recovery". Final Report to California Coastal Conservancy and U.S. Fish and Wildlife Service. US Geological Survey Project Report. 242 pages
- Laird Henkel, Michael D Harris, Jack Ames, R Glenn Ford, Michelle Staedler, M Tim Tinker. 2014. Use of Decoys to Assess Effectiveness of Aerial Surveys for Sea Otters. California Department of Fish and Wildlife Office of Spill Prevention and Response Technical Report 14-2
- Miller, M.A., Oates, S.C., Dodd, E., Johnson, C.K., Tinker, M.T. 2014. Risk Factors for Shark Bite Mortality in Southern Sea Otters. Final Report for California Coastal Conservancy Agreement No. 20129034
- Tinker, M.T. 2013. Appendix B: Southwest Alaska Distinct Population Segment of the Northern sea otter (*Enhydra lutris kenyoni*) Population Viability Analysis (PVA) Update. In USFWS (2013). Southwest Alaska Distinct Population Segment of the Northern Sea Otter (*Enhydra lutris kenyoni*), Recovery Plan 5-Year Review. Marine Mammals Management Office, US Fish and Wildlife Service.
- Estes, J.A., J.L. Bodkin and M.T. Tinker. 2010. "Threatened southwest Alaska sea otter stock: delineating the causes and constraints to recovery of a keystone predator in the North Pacific Ocean". NPRB Project 717 Final Report
- Tinker, M. T., J. L. Bodkin, J. A. Estes, K. Ralls. 2009. Appendix B: Population Viability Analysis for the southwest Alaska sea otter. In USFWS (2009). Southwest Alaska Distinct Population Segment of the Northern Sea Otter (*Enhydra lutris kenyoni*), Draft Recovery Plan. Marine Mammals Management Office, US Fish and Wildlife Service.
- Oftedal, O., K. Ralls, M.T. Tinker and A. Green. 2007. Nutritional constraints on the southern sea otter in the Monterey Bay National Marine Sanctuary, and a comparison to sea otter populations at San Nicolas Island, California and Glacier Bay, Alaska. Final Report to the Monterey Bay National Marine Sanctuary and the Marine Mammal Commission.
- Tinker, M. T., J. A. Estes, K. Ralls, T. M. Williams, D. Jessup, and D. P. Costa. 2006. Population Dynamics and Biology of the California Sea Otter (*Enhydra lutris nereis*) at the Southern End of its Range. MMS OCS Study DRAFT REPORT. Page 351. MMS Cooperative Agreement Number 14-35-0001-31063. Coastal Research Center, Marine Science Institute, University of California, Santa Barbara, California.
- GB Bentall, MT Tinker. 2006. The effect of the Moss Landing Power Plant thermal discharge plume on sea otter behavior and distribution. Report submitted to the Monterey Bay National Marine Sanctuary Integrated Monitoring Network (SIMoN) and Monterey Bay Sanctuary Foundation
- Tinker, M.T., Estes, J.A., Doak, D.F. 2000. Development of a spatially explicit population model to assess potential population impacts associated with translocation of sea otters from south of Pt. Conception. Final report to Friends of the Sea Otter, October, 2000. Monterey, California.
- Estes, J.A., Konar, B., Tinker, M.T. 1998. Sea Otter Population Biology and Subtidal Community Ecology at Shemya Island, Alaska. Final Report for Department of Defense Legacy Project Number 9401280 & 9510014
- Tinker, M.T., Estes, J.A. 1997. Summary Report on Sea Otter Captures for Blood Contaminant Analysis and Collection of Population Data in the Western Aleutian Islands, 1997. Summary Report to the Navy, U.C. Santa Cruz, CA.
- Tinker, M.T., Heaven, P.C., Ingham, L. 1997. Columbia Basin, Large Mammal Monitoring: 1994-97 Aerial Surveys, Final Report. Columbia Basin Fish and Wildlife Compensation Program, Technical Report
- Tinker, M.T., Estes, J.A. 1996. The population ecology of sea otters at Adak Island, Alaska. Final Report to the Navy, Contract # N68711-94-LT-4026, U.C. Santa Cruz, CA.

Selected Talks and Presentations at Professional Meetings

- Tinker, M. T. "Complex food web interactions and diverse ecosystem effects of sea otters". Invited Seminar Speaker, Haida Fisheries Conference, Haida Gwaii, British Columbia, March 2016. [presentation] [Invited]
- Tinker, M. T. "Sea Otter Ecosystem Function in alternative habitats". Invited Seminar Speaker, Moss Landing Marine Labs, California, April 2015. [presentation] [Invited]
- Tinker, M. T. "Growth and Equilibrium in Sea Otters Re-visited: a new paradigm for sea otter conservation". Invited Plenary Presentation to Friends of the Sea Otter Special Event, Big Sur, CA, Sept 2015. [presentation] [Invited]

Dr. M. Tim Tinker, Curriculum Vitae

- Tinker, MT, L Carswell, B Hughes, J Tomoleoni, B Weitzman, B Hatfield, J Estes, J Bodkin, K Ralls, L Bowen, K Miles, M Kenner, M Staedler, M Murray, A Johnson, B Kelly, S Espinosa, J Fujii, T Nicholson, K Mayer, M Miller, L Henkel, D Jessup, M Harris, J Ames, C Young, F Batac, E Dodd, T Burgess, C Johnson, P Conrad, K Shapiro, F Gulland, N Thometz, N LaRoche, L Tarjan, G Bentall, E Golson, S Newsome. 2015. Between a rock (crab) and a sharp place: the curious conundrum of the southern sea otter, and some unexpected silver linings. 21st Biennial Conference of the Biology of Marine Mammals: Bridging the Past to the Future, San Francisco, CA. 13-18 December 2015. [presentation] [Abstract]
- Tinker, MT, B Hatfield, M Harris, J Ames. 2015. Exponential increase in rate of white shark attacks on sea otters in central California: demographic consequences and possible causes. 2015 American Fisheries Society Meeting, Santa Cruz, CA. 9 April 2015 [presentation] [Abstract] [Invited]
- Tinker, M.T., Hughes, B. November 2014. Oral Presentation. From kelp forests to pickle weed: sea otter effects on ecosystem dynamics in two distinct coastal habitats. Invited Presented to the staff for Monterey Bay Aquarium's Conservation Science Seminar Series. [presentation] [Invited]
- Tinker, M.T., J.A. Estes and J. L. Bodkin. 2013. "Effects of landscape and limited mobility on sea otter population recovery". Society for Marine Mammalogy, 20th Biennial Conference on the Biology of Marine Mammals, Dunedin, New Zealand. [presentation] [Abstract]
- Tinker, M.T. and Novak, M. 2013. "Effects of time-averaged sampling on the inferred strength and temporal consistency of intraspecific diet specialization.". Invited speaker at Special Symposium : "Intra-population Niche Variation: From Incidence to Relevance ", 98th Annual Meeting of the Ecological Society of America, Minneapolis, MN, August 2013. [presentation] [Abstract] [Invited]
- Tinker, M.T. 2013. "The sea otters of central California: keystone predators and indicators of near-shore ecosystem influences". Invited plenary speaker at "NRS day 2013: a celebration of the UC Nature Reserve System", Bren School of Environment, UC Santa Barbara, Feb 2013. [presentation] [Invited]
- Tinker, M.T. 2013. "A paradigm coming of age? The promises, pitfalls and ontology of the Top-down system of thought in ecology". Invited plenary speaker for Presidential Symposium, Western Society of Naturalists Annual Meeting, Oxnard, CA, November 2013. [presentation] [Abstract] [Invited]
- Tinker, MT, B Hatfield, M Harris, J Ames. 2013. Exponential increase in rate of white shark attacks on sea otters in central California: demographic consequences and possible causes. Sea Otter Conservation Workshop. March, 2013, Seattle, WA. [presentation] [Abstract]
- Tinker, MT, B Hatfield, M Harris, J Ames. 2012. When the Shark Bites: Implications of Increasing White Shark Attacks for Southern Sea Otters. Southern Sea Otter Research Update Meeting. Feb 2013. Santa Cruz, California. [presentation] [Abstract]
- Tinker, M.T., J.L. Bodkin, M. Staedler, D.H. Monson, B. Ballachey, K. Kloecker, G. Esslinger, H. Coletti, G. Bentall, J. Estes, O.T. Oftedal, K. Ralls, J. Tomoleoni, N. LaRoche, B. Weitzman, and J. Perry, 2011, Sea otter foraging ecology and energetics across populations. Sea Otter Conservation Workshop VII, March 2011, Seattle, WA. [presentation] [Abstract]
- Tinker, M.T., Hatfield, B.B., Harris, M.D. and Ames, J.A.. 2011. "Increasing mortality from white shark attacks drives decline in southern sea otters: estimating demographic impacts using a spatially structured projection model". Society for Marine Mammalogy, 19th Biennial Conference on the Biology of Marine Mammals, Tampa, Florida. [presentation] [Abstract]
- Tinker, M.T., Guimarães, P.R., Novak, M. 2011. "The structure and mechanisms of intraspecific diet polymorphisms". Invited speaker at Special Symposium "The Ecological Consequences of Intraspecific Variation ", 96th Annual Meeting of the Ecological Society of America, Austin, Texas, August 2011. [presentation] [Abstract] [Invited]
- Tinker, M.T., and Novak, M. 2011. "Measuring temporal consistency of intraspecific diet specialization.". Invited speaker at special symposium, "Individuality in Marine Mammals. Society for Marine Mammalogy, 19th Biennial Conference on the Biology of Marine Mammals, Tampa, Florida.[presentation] [Abstract] [Invited]
- Tinker, M.T. 2011. "Diets and Energetics Across Sea Otter Populations". 7th Annual International Workshop on Sea Otter Conservation, Seattle, WA. [presentation] [Abstract]
- Tinker. M. T. "Causes and Sonsequences of Diet Specialization in Sea Otters". Invited Seminar Speaker, Moss Landing Marine Labs, California, May 2010. [presentation] [Invited]
- Tinker. M. T. "Diet Specialization and Disease Exposure in Sea Otters". Invited Seminar Speaker, UC Davis Wildlife Epidemiology Class, California, February, 2010. [presentation] [Invited]
- Tinker, M.T., J. Bodkin, M. Staedler, D. Monson, and G. Bentall, 2009, Using archival time-depth recorders to measure within- and between-population variation in diet and foraging success of sea otters. Carnivores Conference, Nov. 2009, Denver, CO. [presentation] [Abstract]
- Tinker, M.T., Guimarães, P.R., Novak, M., Staedler, M.M., Bentall, G.B., Bodkin, J.L., Estes, J.A. Oct. 2009. Using network analysis to assess individual patterns of resource use: sea otters exhibit modularity at high density sites, providing evidence for a facultative diet polymorphism. Marine Mammal Society International Biannual Conference. Oct. 2009, Quebec City, Canada. [presentation] [Abstract]

Dr. M. Tim Tinker, Curriculum Vitae

- Tinker, M.T., D. Monson, G. Esslinger, M. Staedler, J.L. Bodkin, 2009, Inferring reproductive and survival events from TDR data. Sea Otter Conservation Workshop VI, March 2009, Seattle, WA. [presentation] [Abstract]
- Tinker, M.T., Christine Kreuder-Johnson, Melissa Miller, Dave Jessup, Jonna Mazet, Daphne Carlson Bremer,, Pat Conrad, James Estes. 2009. "Diet, density, disease and death in sea otters: implications for conservation and management." Carnivore Conference: Carnivore Conservation in a Changing World, Nov 2009, Denver, CO. [presentation] [Abstract]
- Tinker, M.T., Bodkin, J., Staedler, M.M., Esslinger, G., Monson, D.H. May 2009 "Using core temperature records from biologging records to detect reproductive events." International sea otter conservation workshop, Seattle, WA. [presentation] [Abstract]
- Tinker, M.T. Sept. 2009. Density-dependent diet diversification and individual differences in foraging behavior determine risk of disease exposure in southern sea otters. Society for Conservation Biology, Flagstaff, AZ. [presentation] [Abstract]
- Tinker, M.T. Jan 2009. Using long term research on sea otters and kelp forest food webs to study the effects of climate change on coastal ecosystems. USGS/USFWS COASTAL CLIMATE CHANGE CONFERENCE FOR CALIFORNIA, OREGON AND WASHINGTON. San Francisco, CA. [presentation] [Abstract]
- Tinker, MT. 2008. "Sea otter diets & population status: causes and consequences of individual foraging specializations" Invited Speaker at UC Santa Cruz EE Biology Seminar Series, June 2008: [presentation] [Invited]
- Tinker, M.T., J. Bodkin, M. Staedler., G. Esslinger, D. Monson, G. Bentall, and M. Murray, 2008, Using TDR records to detect reproductive events in sea otters. International Biologging Conference, Sept. 2008, Pacific Grove, CA. [presentation] [Abstract]
- Tinker, MT. 2007. "Sea otter diets & population status: causes and consequences of individual foraging specializations". Invited Speaker at Bodega Marine Laboratories Seminar Series, Jan 2007 [presentation] [Invited]
- Tinker, M.T., G. Bentall, A. Burdin, and J.A. Estes. 2007. Ecological and behavioral responses to K: sea otters and kelp forest ecosystems in the Aleutian and Commander islands. 17th Biennial Conference on the Biology of Marine Mammals, Cape Town, South Africa. [presentation] [Abstract]
- Tinker, M.T., C. Kreuder-Johnson, P. Conrad, M. Staedler, D. Jessup, J. Estes, M. Miller and J. Mazet. 2007. Linking Individual Behavior and Population Health: Tracking Protozoal Pathogen Exposure in Southern Sea Otters. 5th Workshop on Sea Otter Conservation, Seattle, WA. [presentation] [Abstract]
- Tinker, M.T., C. Kreuder-Johnson. 2006. Linking Individual Behavior and population health: a multidisciplinary approach to predicting risk of disease exposure in sea otters. 20th Annual Meeting of the Society for Conservation Biology, San Jose, CA. [presentation] [Abstract]
- Tinker, M.T., J.A. Estes, M.M. Staedler, J.L. Bodkin. 2005. Alternative diet specializations in the southern sea otter: energetic implications of a behaviorally-mediated foraging polymorphism. 16th Biennial Conference on the Biology of Marine Mammals, San Diego, CA. [presentation] [Abstract]
- Tinker, M.T., D.P. Costa, J.A. Estes, N. Wieringa. 2005. Individual dietary specialization and dive behavior in the California sea otter: using archival time-depth data to detect alternative foraging strategies. 2nd International Bio-logging Science Symposium, St. Andrews, Scotland. [presentation] [Abstract]
- Tinker, M.T., D.F. Doak, J.A. Estes. 2005. Effect of demographic variation and dispersal patterns at multiple spatial scales on the population recovery and range expansion of a threatened carnivore. 90th Annual Meeting of the Ecological Society of America, Montreal, Canada. [presentation] [Abstract]
- Tinker, M.T., J.A. Estes, J.L. Bodkin, M.M. Staedler, and D.H. Monson, 2004, Studying sea otter foraging ecology: a review of some methodological approaches. Alaska sea otter research priorities workshop: Addressing the decline of the southwest Alaska sea otter population. April 2004, Seward, AK. [presentation] [Invited]
- Tinker, M.T., Estes, J.A., Yeates, L., Staedler, M.M. 2002. Studying Sea otter Foraging Ecology. California and the World Ocean '02, Santa Barbara, CA [poster] [Abstract]
- Tinker, M.T., Estes, J.A., Staedler, M.M., Bodkin, J. 2002. Sea otter Foraging Ecology: Sources of Variation in Dive Behavior, Diet and Foraging Success. Carnivores 2002 - From the Mountains to the Sea: A Conference on Carnivore Biology and Conservation, Monterey, CA. [presentation] [Abstract]
- Tinker, M.T., Estes, J.A., Doak, D.F. 2000. A Model of Southern Sea Otter Population Dynamics and Range Expansion. Seventh Joint US-Russia Sea Otter Workshop, Monterey, California. [presentation] [Abstract]
- Tinker, M.T., Doak, D.F. 2002. Southern Sea Otter Demography and Population Analyses. Carnivores 2002 From the Mountains to the Sea: A Conference on Carnivore Biology & Conservation, Monterey, CA. [presentation] [Abstract]
- Tinker, M.T., Estes, J.A., Mangel, M. 2001. Individual variation in diet and feeding behavior of sea otters: cultural transmission of foraging skills contributes to the persistence of alternative foraging specializations. Invited Presentation at the Workshop on Culture in Marine Mammals, Fourteenth Biennial Conference on the Biology of Marine Mammals, Vancouver, British Columbia. [presentation] [Abstract]

Dr. M. Tim Tinker, Curriculum Vitae

- Tinker, M.T., J.A. Estes, J.P. Watt, and D.H. Monson, 1999. A comparison of indices used to assess sea otter population status: scats may be worth a closer look. Biennial Conference, Biology of Marine Mammals, XIII, Wailea, HI. [presentation] [Abstract]
- Tinker, M.T., Estes, J.A. 1997. Sea otter population decline in the western Aleutian Islands: an overview of trends, effects and possible causes. Sixth Joint US-Russia Sea Otter Workshop, Forks, Washington. [presentation] [Abstract]
- Tinker, M.T., Estes, J.A. 1997. Is food-limitation causing the sea otter population decline at Adak Island, Alaska? Contrary evidence from activity budgets, diet and prey Size. Twelfth Biennial Conference on the Biology of Marine Mammals, Monaco. [presentation] [Abstract]
- Tinker, M.T., Estes, J.A., Meehan, J. 1996. Demography, behavior and diet of sea otters at Adak Naval Reservation, Alaska. The Wildlife Society Third Annual Conference, Cincinnati, Ohio. [presentation] [Abstract]
- Tinker, M.T., Kovacs, K.M., Hammill, M.O. 1993. Reproductive behavioral tactics of male grey seals breeding on landfast ice. Tenth Biennial Conference on the Biology of Marine Mammals, Galveston, Texas. [presentation] [Abstract]