Matt K. Gough

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Summary

My diverse background includes experience as a researcher (oceanography and meteorology), educator (ESL, high school, and college), and corporate scientist (windpower meteorologist). I have been involved with a number of oceanographic research consortia: the Central and Northern California Ocean Observing System (CeNCOOS), the Consortium for Advanced Research on Transport of Hydrocarbons in the Environment (CARTHE), the Consorcio de Investigación del Golfo de México (CIGOM), the Office of Naval Research (ONR) Innershelf DRI, and currently the Strategic Environmental Research and Development Program (SERDP).

Education

Ph.D., Applied Marine Physics, 2016, University of Miami – RSMAS, Miami, FL
Ph.D. student (1 year), Physical Oceanography, 2011, Naval Postgraduate School, Monterey, CA
M.S., Applied Geosciences, 2008, San Francisco State University, San Francisco, CA
B.S., Atmospheric Science, 1992, University of California at Davis, Davis, CA

Professional Experience

Research Associate, 2017--Present, Naval Postgraduate School, Monterey, CA. Currently investigating scour burial of objects on the sea bed and sand ripple evolution with sonar imagery as part of the DoD, DOE, and EPA funded SERDP (PI: Dr. Peter Chu). Previously performed analyses on heat fluxes, internal waves, and temperature variability over the inner shelf in the vicinity of Pt. Sal in central California as part of the ONR funded Innershelf DRI. PI: Dr. Jamie MacMahan.

Postdoctoral Researcher, 2016--2017, Centro de Investigación Cientifica y de Educación Superior de Ensenada (CICESE), Division de Oceanología, Ensenada, Mexico. Performed an analysis of climatological Lagrangian Coherent Structures in the Gulf of Mexico. PIs: Dr. Julio Sheinbaum and Dr. Francisco J. Beron-Vera.

Research Assistant, 2008--2010, Romberg Tiburon Center – San Francisco State University, Tiburon, CA. Contributed to the research, development, and maintenance of HF-radars used for measuring surface currents as part of the California Ocean Current Monitoring Program. (COCMP). PI: Dr. Toby Garfield.

Consultant, 2009, Applied Science Associates, Seattle, WA. Performed an extensive literature review on oceanographic and meteorological research along the northwest coast of the U.S. as part of an environmental impact report for the Minerals Management Service.

Earth Science Teacher, 2002--2004, Aviation High School, Long Island City, NY. Taught Earth Science and Astronomy to New York City public high school students in Queens, NY.

Computer Lab Technician, 1999--2002, Lawton Alternative School, San Francisco Unified School District, San Francisco, CA. Maintained a computer lab for elementary and junior high students.

English Teacher, 1996-1998, Golden School Bt. and Danubius Nyelviskola, Budapest, Hungary. Taught business and conversational English at a number of companies and schools.

Meteorologist, 1993—1996, Kenetech Windpower, San Francisco, CA. Duties included assessing wind-plant performance, estimating proposed wind-plant performance, and performing analyses on wind resource potential.

Research Assistant, 1991--1992, Atmospheric Science Department – University of California, Davis, CA. Participated in studies on the El Nino Southern Oscillation and Ozone concentration in the Sierra Nevada foothills.

Student Intern, 1990--1991, California Air Resources Board, Sacramento, CA. Assisted in monitoring and analyzing air quality in the Sacramento Valley.

Publications

Gough, M. K., Peter Chu, Vinicius S. Pressanha, Joseph Calantoni (2022, under review). Deep scour burial of a tapered cylinder by an energetic wave event. *IEEE Journal of Oceanic Engineering*.

Pessanha, Vinícius S., Peter C. Chu, Matt K. Gough, and Peter Traykovski (2022, under review). Observations and Model Simulation of Sand Wave Migration in Tidally Energetic Shallow Water Environment and the Impact of Ocean Waves. *JGR-Oceans*.

Gough, M. K., Peter Chu, Jamie H. MacMahan, Thomas M. Freismuth, Michael Kovatch, Nirnimesh Kumar (2022, in prep.) Diurnal Temperature Variability off Pt. Sal, Central California. JGR-Oceans

Kumar, N. et al., The Inner Shelf Dynamics Experiment, (2020), *Bulletin of the American Meterological Society*. https://journals.ametsoc.org/view/journals/bams/aop/BAMS-D-19-0281.1/BAMS-D-19-0281.1.xml

Patria, Nick , Jamie MacMahan, Ed Thornton, Casey Gon, Shawn Harrison, Matt Gough, Mark Denny, (2020, under revision). Unmanned Aerial System Optical Imagery of Wave-Swept, Surge-Channel Rip Currents Along Rocky Shores, *Continental Shelf Research.*

Gough, M. K., Thomas M. Freismuth, Jamie H. MacMahan, John A. Colosi, Sutara H. Suanda, Nirnimesh Kumar (2020): Heating of the Mid and Inner Shelf by Warm Internal Tidal Bores. *J. Phys. Oceanogr.* 10.1175/JPO-D-19-0143.1

Feddersen, F., MacMahan, J. H., Freismuth, T. M., Gough, M. K., & Kovatch, M. (2020). Inner-shelf vertical and alongshore temperature variability in the subtidal, diurnal, and semidiurnal bands along the central California coastline with headlands. *Journal of Geophysical Research:Oceans*, 125, e2019JC015347. https://doi.org/10.1029/2019JC015347

Gough, M. K., F.J. Beron-Vera, M.J. Olascoaga, J. Sheinbaum, J. Jouanno, and R. Duran (2019): Persistent Lagrangian transport patterns in the northwestern Gulf of Mexico. *J. Phys. Oceanogr.*, **0**, https://doi.org/10.1175/JPO-D-17-0207.1

Gough, M. K., A. Reniers, M. J. Olascoaga, B. K. Haus, J. MacMahan, J. Paduan, and C. Halle (2016), Lagrangian Coherent Structures in a coastal upwelling environment, *Continental Shelf Research*, *128*, 36-50, doi:http://dx.doi.org/10.1016/j.csr.2016.09.007.

Gough, M. K., A. J. H. M. Reniers, J. H. MacMahan, and S. D. Howden (2016), Resonant near-surface inertial oscillations in the northeastern Gulf of Mexico, *Journal of Geophysical Research: Oceans*, *121*(4), 2163-2182, doi:10.1002/2015JC011372.

Gough, M. K. (2016). Part 1: Lagrangian Coherent Structures in a Coastal Upwelling Envirnonment; Part 2: Near-Inertial Oscillations in the Northeastern Gulf of Mexico. Applied Marine Physics. Miami, FL, University of Miami - RSMAS. *PhD Dissertation*.

Mariano, A. J., E. H. Ryan, H. S. Huntley, L.C. Laurindo, E. Coelho, A. Griffa, T. M. Özgökmen, M. Berta, D. Bogucki, S. Chen, M. Curcic , M. Gough, B. K. Haus, A. C. Haza, P. Hogan, M. Iskandarani, G. Jacobs, A. D. Kirwan, Jr., N. Laxague, B. Lipphardt, Jr., M. G. Magaldi, G. Novelli, A. Reniers, J. M. Restrepo, C. Smith, A. Valle-Levinson, and M. Wei (*submitted October* 2015). "Statistical properties of the surface velocity field in the northern Gulf of Mexico sampled by GLAD drifters." *JGR-Oceans, Gulf Oil Spill special section*.

Jacobs, G.A., B. Bartels, D. Bogucki, F.J. Beron-Vera, S. S. Chen, E.F. Coelho, M. Curcic, A. Griffa, M. Gough, B.K. Haus, A.C. Haza, R.W. Helber, P.J. Hogan, H. Huntley, M. Iskandarani, F. Judt, A.D. Kirwan Jr., N. Laxague, A. Valle-Levinson, B. Lipphardt, A. Mariano, H.E. Ngodock, G. Novelli, M.J. Olascoaga, T.M. Özgökmen, P.G. Thoppil, A.C. Poje, A. J.H.M. Reniers, C.D. Rowley, E.H. Ryan, S.R. Smith, P.L. Spence, and M.Wei (2014), Data assimilation considerations for improved ocean predictability during the Gulf of Mexico Grand Lagrangian Deployment (GLAD), *Ocean Modelling*, *83*(0), 98-117, doi:http://dx.doi.org/10.1016/j.ocemod.2014.09.003.

Hubbard, M., D. Barrick, N. Garfield, J. Pettigrew, C. Ohlmann, and M. Gough, (2013) A new method for estimating high-frequency radar error using data from Central San Francisco Bay, *Ocean Science Journal*, 48(1), 105-116, doi:10.1007/s12601-013-0009-y.

Gough, M. K., N. Garfield, and E. McPhee-Shaw (2010), An analysis of HF radar measured surface currents to determine tidal, wind-forced, and seasonal circulation in the Gulf of the Farallones, California, United States, *Journal of Geophysical Research-Oceans*, *115*.

Gough, M. K., C. Beegle-Krause, and N. Garfield (2010), Updated Summary of Knowledge: Selected Areas of the Pacific Coast - Physical Oceanography Section, edited by B. o. O. E. M. U.S. Department of the Interior, Regulation, and Enforcement, Camarillo, CA.

Gough, M. (2008), An analysis of HF-radar measured surface currents, Gulf of the Farallones, California, *Master's of Science Thesis, San Francisco State University*.

Selected Conference Presentations

Matt Gough, Jamie MacMahan, Falk Feddersen, Peter Chu, Tucker Friesmuth, John Colosi, Amy Waterhouse, Jenn McKinnon, Jack Barth, Jim Lerzack, Joe Calantoni, Jim Thomson (2020), Diurnal Temperature Variability off Pt. Sal, California, *AGU Ocean Sciences Meeting, San Diego, California.*

Matt Gough, Tucker Friesmuth, Jamie MacMahan, Jacqueline McSweeney, Jack Barth, Jim Lerczak, Nirnimesh Kumar, Falk Feddersen (2018), The Influence of Diurnal Wind Forcing on Internal Waves over the Inner Shelf, *Eastern Pacific Oceanography Conference (EPOC), Mt. Hood, Oregon.*

Matt Gough, Jamie MacMahan, Tucker Friesmuth, Falk Feddersen, John Colosi, Amy Waterhouse, Jenn McKinnon, Jack Barth, Jim Lerzack, Joe Calantoni, Jim Thomson (2018), The spatial variability of heat flux across the surfzone transition region, *AGU Ocean Sciences Meeting, Portland, Oregon.*

Gough, M. K., Francisco J. Beron-Vera, M. J. Olascoaga, Julio Sheinbaum, Julien Jouanno (2017), Climatological Lagrangian Coherent Structures in the Gulf of Mexico, *Reunion anual CIGOM, Ensenada, Mexico* .

Gough, M. K., A. J. H. M. Reniers, and J. MacMahan (2015), Observed surface current patterns influenced by bathymetry and wind forcing along the shelf of the Northeastern Gulf of Mexico, in *Gulf of Mexico Oil Spill and Ecosystem Science Conference*,, Houston, TX.

Gough, M. K., A. J. H. M. Reniers, and J. MacMahan (2014), NEAR-INERTIAL SURFACE CURRENTS AND THEIR INFLUENCE ON SURFACE DISPERSION IN THE NORTHEASTERN GULF OF MEXICO NEAR THE DEEPWATER HORIZON OIL SPILL., paper presented at Fall AGU Meeting, San Francisco, CA.

Gough, M. K., and A. J. H. M. Reniers (2014), NEAR-INERTIAL SURFACE CURRENTS IN THE NORTHEASTERN GULF OF MEXICO USING HF RADAR AND GPS-TRACKED DRIFTERS DURING THE GLAD EXPERIMENT, in *AGU -Ocean Sciences*, edited, Honolulu, HI.

Gough, M. K., and A. J. H. M. Reniers (2014), Near-Inertial Surface Currents in the Northeastern Gulf of Mexico using HF radar and GPS-tracked Drifters, in *Gulf of Mexico Oil Spill and Ecosystem Science Conference*, Mobile, AL.

Gough, M. K., and A. J. H. M. Reniers (2013), Inertial Currents in the Northern Gulf of Mexico during the GLAD Experiment, in *Gulf of Mexico Oil Spill and Ecosystem Science Conference*, New Orleans.

Gough, M., C. Halle, J. Largier, and T. Garfield (2010), An Analysis of Near-Coastal Surface Current Divergence and Vorticity Patterns Using HF Radar, in *AGU-Ocean Sciences*, Portland, Oregon.

Gough, M., C. Halle, T. Garfield, and J. Largier (2010), Oceanic Near-Coastal Frontal Mapping, in *California and World Oceanography Conference*, San Francisco, CA.

Gough, M., and N. Garfield, *Spectrum Analysis and Divergence Patterns in the Gulf of the Farallones using HF-radar*, Eastern Pacific Oceanography Conference, September, 2008, Fallen Leaf Lake, CA.

Gough, M., and N. Garfield, *Surface Currents using HF-radar: Gulf of the Farallones*, AGU-Ocean Sciences Conference, February, 2008, Orlando, FL.

Monteverdi, J. P., E. Polito, M. Gough, R. Bethke, and T. Seddon, *An Analysis of a Prolific Tornado-producing Cyclic Supercell Thunderstorm in Nuckolls County Nebraska, May 24, 2004*, in The 24th Conference on Severe Local Storms, October, 2008, Savannah, GA.

Gough, M., and N. Garfield, *Gulf of the Farallones Tidal Variations*, American Geophysical Union Conference, December, 2007, San Francisco, CA.

Student Contributions

Pessanha, Vinícius S. (2022),), Naval Postgraduate School, Monterey, CA. *Ph.D. committee member*.

Patria, Nick (2019), Naval Postgraduate School, Monterey, CA. *Contributed to M.S. Thesis.*

Friesmuth, Thomas M. (2018), Cross-shelf Heat Flux and Temperature Variability on the Central California Inner Shelf, 101 pp, Naval Postgraduate School, Monterey, CA. *Contributed to Ph.D. Thesis.*

Morrone, Aaron M. (2017), Diurnal Sea Breeze Effects on Nearshore Temperature Variability in Southern Monterey Bay, 34 pp, Naval Postgraduate School, Monterey, CA. *Contributed to M.S. Thesis.*

Fontana, R. (2013), Physical Processes and their Influence on Zooplankton Composition and Foraging Opportunities for Seabirds in a Strong, Persistent Upwelling Region: Gulf of the Farallones-Cordell Bank (California), 143 pp, UC Davis, Bodega, CA. *Contributed to Ph.D. Thesis.*

Hubbard, M. (2010), Analyses of high-frequency radar data in central San Francisco Bay, San Francisco State University. *Committee member and contributed to M.S. Thesis.*

Field Experiments

Inner Shelf DRI – September-October, 2017 near Pt. Sal, central California. Involved with the deployment of 48 thermistor strings and 8 ADCPs from small boats.

Surfzone Coastal Oil Pathways Experiment (SCOPE) – December, 2013 in Destin, FL. Deployed and collectd GPS-tracked surface drifters, performed CTD casts, deployed rhodamine dye and surfzone fluorometers, and performed GPS beach surveys.

Grand Lagrangian Deployment (GLAD) – July, 2012 in the Gulf of Mexico on the R/V Walton Smith. Collected and deployed GPS-tracked drifters, performed CTD casts, and performed an AUV survey.

River and Estuarine Transport (RIVET) I – May, 2012 at New River Inlet, North Carolina. Deployed rhodamine dye, performed AUV surveys, performed CTD casts, and deployed ADCPs.

San Francisco Bay drifter study – October, 2008 in San Francisco, CA. Deployed and collected GPS-tracked drifters to verify HF-radar surface current observations.