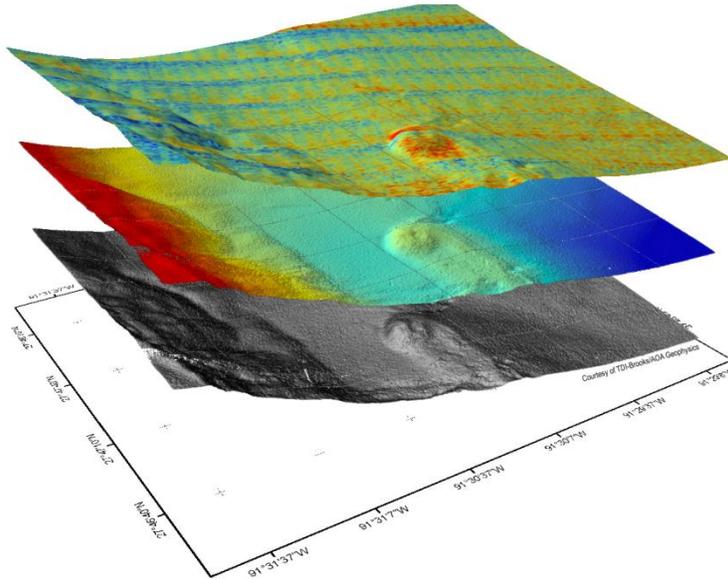


STATEMENT OF QUALIFICATIONS



SeaSpatial Consulting
136 Trescony St
Santa Cruz, California 95060
Phone: +1 831 515 8188
info@seaspatial.com

Company Profile

SeaSpatial Consulting (SeaSpatial) was founded in 2009 in Santa Cruz, California for the purpose of providing high-quality Geographic Information Systems (GIS), marine science, and seafloor mapping services to public and private sector clients throughout the world. We use the latest technology and techniques to assist clients in the planning, implementation, analysis, or display of marine biological and geophysical surveys for biological assessments, fish habitat mapping, pipeline or cable routing, underwater construction, subsea field layout development, and more.

SeaSpatial specializes in:

- Full-Stack web map development and implementation
- GIS for ecological analysis and fisheries management
- Python programming for spatial modeling and analysis
- GIS for pipeline, cable, and subsea equipment planning and development
- Data management and analysis
- Map making and charting
- Multibeam and sidescan sonar survey client representation
- Marine biological surveys and assessment

Principal

Matthew Levey, M.S.

Marine Scientist

SeaSpatial's chief scientist is Mr. Matthew Levey. Mr. Levey has a Master of Science degree in Marine Science from Moss Landing Marine Laboratories and has worked in the marine science field for over 25 years. He specializes in web based and desktop Geographic Information Systems (GIS) for geophysical, biological, and environmental data as well as scientific computing for spatial modeling and analysis. He also has extensive experience on large-scale biological and geophysical surveys and has been a client representative for Unocal, Kerr-Mcgee, Reliance India, Noble Energy, Devon Energy, TGS-NOPEC, Black Gold Energy, and British Gas for oil exploration, geohazard surveys, and pipeline route planning. He has worked in Mexico, Indonesia, Brazil, India, Spain, Trinidad and Tobago, Ecuador, Morocco, Turkey, Angola, Australia, and the Gulf of Mexico. In addition, Mr. Levey has experience acquiring and processing multibeam and sidescan sonar data, as well as working with seismic, subbottom profiler, magnetometer, and gravitometer acquisition and data.

Selected Recent Projects

- **GIS Development and Support, July 2014 – Present**

Client: Liquid Robotics, Inc., a Boeing Company.

SeaSpatial is providing support for Esri ArcGIS Server and GeoServer based web maps and geoprocessing services, including Python programming support, data management, and development of web based applications for mapping and geoprocessing.

- **Web Mapping Development and Deployment, December 2017 - Present**

Client: Elkhorn Slough Foundation

SeaSpatial works with Elkhorn Slough Foundation water quality staff to develop and maintain a water quality report card webmap for their water quality sampling program at <https://water.elkhornslough.org> and develops custom data science tools for analysis.

- **Nursery Functions of West Coast Estuaries: A State of the Knowledge Report, January – October 2014**

Client: The Nature Conservancy

SeaSpatial compiled and summarized existing information on the nursery function of West Coast estuaries for 15 selected fish and invertebrate species. A State of the Knowledge Report and geodatabase were delivered.

- **Subbottom profiler survey of Elkhorn Slough, September 2012**

Client: Elkhorn Slough Foundation

SeaSpatial planned and managed the collection, analysis, and display of subbottom profiler data for investigating historical geophysical and biological trends within Elkhorn Slough.

- **Subsea Field Layout and Development, Global, January 2009 – 2014**

Client: Chevron Energy Technology Company

SeaSpatial provided GIS and database management expertise for the planning, development, implementation, analysis, and management of subsea oil and gas fields and pipeline and cable route planning.

Below is a select project on which SeaSpatial personnel had participated:

- **Geophysical survey for exploration, Indonesia, 2006 – 2008**

Client: TGS-Nowpec Geophysical Company and Black Gold Energy Company

SeaSpatial personnel were project management and client representatives for a large-scale geophysical survey of multiple Indonesia deep-water basins. This project surveyed over 400,000 km² of seafloor and cored over 1,000 locations acquiring multibeam bathymetry and backscatter, subbottom profiler, magnetometer, gravity, geotechnical, geochemical, and heat probe data. At sea and onshore, multibeam and backscatter data were interpreted along with subbottom profiler data and previously collected seismic data to find potential seafloor seeps for follow-up coring. As Project Manager and Lead Client Representative, Mr. Levey assisted with survey planning, was responsible for hiring and overseeing the work of 27 contractors and employees, providing QA/QC for data acquisition, managing multiple terabytes of geophysical data, and delivered complete GIS packages for 15 basins.

Curriculum vitae

Matthew D. Levey
Principal SeaSpatial Consulting
136 Trescony St, Santa Cruz, CA 95060
+1 831 515 8188
mlevey@seaspatial.com

Education

Moss Landing Marine Laboratories, Moss Landing, CA
M.S., Marine Science
May 2005

San Diego State University, San Diego, CA
B.S., Biology; B.A., Political Science
May 1995

Professional Experience

- 01/01/09 – Present Principal: SeaSpatial Consulting, Santa Cruz, CA
Python programming; including the use of the Scipy stack (Pandas, Numpy, and Scipy) for data analysis and geoprocessing. Development of web maps using Esri, Docker, GeoServer, Leaflet, and Mapbox APIs, along with HTML, CSS, and JavaScript. Create, process, manage, and analyze spatial data sets in GIS for interpretation and display, including the production of charts and maps.
- 02/15/03 – 12/31/08 Project Manager: AOA Geophysics Inc., Moss Landing, CA
Oversee and lead staff scientists in creating, processing, managing, and analyzing marine spatial data sets in GIS for interpretation and display, including the production of charts and maps. Plan and implement seafloor mapping surveys worldwide using multibeam, sidescan sonar, and subbottom profiler systems. At sea, oversee the operation of seafloor mapping surveys to ensure data accuracy and consistency, and to facilitate communication between clients and contractors.
- 01/03/02 – 02/14/03 Research Technician: Center for Habitat Studies, Moss Landing Marine Labs
Use various GIS applications for the interpretation of remote sensing data for the creation of habitat maps. Assist with the planning, implementation, processing, and display of seafloor mapping projects. Digital video editing and production. Deploy and troubleshoot computer systems. Maintain network connectivity and productivity.
- 05/27/02 – 09/30/02 Research Assistant: Habitat Ecology Group, NOAA Fisheries, Santa Cruz, CA
Conducted age and growth study on flag rockfish. Analyzed and interpreted laser-line scan data. Assisted with subtidal collection of juvenile rockfish. Summer only position.

- 06/01/01 – Research Technician: Seafloor Mapping Lab, California State University,
8/31/01 Monterey Bay
Assist in the collection and processing of bathymetric data using multibeam and sidescan sonar systems for the purpose of marine habitat mapping. Troubleshoot computer/seafloor mapping systems at sea. Summer only position.
- 11/12/96 – Fisheries Technician: Pacific States Marine Fisheries Commission, La Jolla /
07/15/01 Monterey, CA
Fishery data collection and analysis. Otolith reading. Report writing. Participation in fisheries research cruises. Database creation and management. Computer upkeep, software and hardware installation.
- 04/15/96 – Scientific Aid: California Department of Fish and Game, Long Beach, CA
11/10/96 Field identification and data collection of marine fish and invertebrates. Otolith extraction and preparation. Fish sex and maturity determination. Data entry and analysis. Present oral and written reports to supervisor.

Presentations and Posters

Levey, M.D., D. Orange, A. García-García, M. Todd, J. Fabres, and A. Gardner. 2005. “High resolution Seafloor Mapping off the Cap de Creus Canyon Head, West Gulf of Lion”. AAPG 2005 Annual Convention: Exploring Energy Systems, 19-22 June, Calgary, Canada, A81.

Levey, M.D. November 2006. “Patterns of reef fish distribution and abundance among selected locations in the Gulf of California” at the 87th meeting of the Western Society of Naturalists, November 2006.

Levey, M.D., A. García-García, D. L. Orange, M. Mulrey, G. Shipton, I. Herbert, and RV Pelican field party. October 2008. “Preliminary results and QC of a shallow-water, high-resolution acoustic survey near Panama City, Florida” Presentation at Shallow Survey 2008, Portsmouth, New Hampshire, USA.

Orange, D. L., P.A. Teas, J. Decker, P. Baillie, P. Gilleran, and M. D. Levey. December 2008 “The Utilisation of SeaSeep Surveys (a Defense / Hydrography Spin-Off) to Identify and Sample Hydrocarbon Seeps in Offshore Frontier Basins”. Presentation to International Petroleum Technology Conference, Kuala Lumpur, Malaysia.

Moore, C., A. Colyer, T. O’Donnell, J. Ellis, M. Levey, and D. Greene. February 2009. “ArcGIS and 3D Simulation – Life of Field Planning Tool”. Presentation at the 2009 ESRI Petroleum Users Group Conference. Houston, Texas, USA.

Levey, M.D., A. García-García, and D. L. Orange. December 2009. “Evidence of hurricane-induced mudflows and their characteristics near the West Delta, Gulf of Mexico”. Poster presented at AGU Fall Meeting, San Francisco, California, USA.

Sandoval, E. and M. Levey. February 2010. “Predicting Marine Species Occurrence Utilizing GIS and Habitat Preference Models”. Poster presented at AGU Ocean Sciences Meeting. Portland, Oregon, USA.

Levey, M.D., A. García-García, and E. B. Watson. December 2011. Mapping Modern and Historical Geological Changes to the Upper Elkhorn Slough Estuary, Moss Landing, California. Poster presented at AGU Fall Meeting, San Francisco, California, USA.

Levey, M.D., and B.B. Hughes. November 2013. Mapping the implications of low oxygen (hypoxia) on available habitat for select species of flatfish in Elkhorn Slough. Presentation at ESRI Ocean GIS Forum. Redlands, California, USA.

Publications

Schoolmeester, T., J. Fabres, M. Canals, A. Orange, E. Grossman, A. Garcia-Garcia, M. Field, and M. Levey. 2005. Shallow sediment structure revealed from high resolution surveys in the upper Cap de Creus Canyon. In Final EuroSTRATAFORM Meeting, pp. 24-27.

García-García, A., T. Schoolmeester, D. Orange, A. Calafat, J. Fabres, E. Grossman, M. Field, T. Lorenson, M. Levey, and M. Sansoucy. 2012. Sediments, Morphology and Sedimentary Processes on Continental Shelves: Advances in technologies, research and applications (Special Publication 44 of the IAS), 109, 71-98.

García-García, A., M.D. Levey, and E.B. Watson. 2013. High resolution seismic study of the Holocene infill of the Elkhorn Slough, central California. *Continental Shelf Research*. 55, 108 – 118.

Hughes, B.B., M.D. Levey, J. Brown, M. Fountain, A.B. Carlisle, S.Y. Litvin, C.M. Greene, W.N. Heady, and M.G. Gleason. 2014. Nursery functions of US West Coast estuaries: the state of knowledge for juveniles of focal invertebrate and fish species. Arlington, Virginia: Nature Conservancy.

Hughes, B.B., M. D. Levey, M.C. Fountain, A.B. Carlisle, F.P. Chavez, Gleason, and M.G. Gleason. 2015. Climate mediates hypoxic stress on fish diversity and nursery function at the land–sea interface. *Proceedings of the National Academy of Sciences*. 112:26, 8025-8030.

Technical Skills

ESRI ArcGIS certified

Python, Numpy, Scipy, Pandas, xarray, JavaScript, HTML, and CSS programming
Full-Stack spatial data programming and development on Linux and Windows platforms
Multibeam acquisition using Simrad Merlin and SIS, and processing using Caris HIPS
Sidescan sonar acquisition/processing using SonarPRO and Triton Imaging’s ISIS
SPSS, Canoco, and Systat statistical and multivariate statistical analysis software
NAUI Scientific Diver

