

Eugene C. Revelas

Senior Consultant



Education and Credentials

M.S., Marine Environmental Sciences, State University of New York, Stony Brook, 1984

B.S., Geology and Geophysics, Yale University, 1981

Continuing Education and Training

Hazardous Waste Operations and Emergency Response 40-Hour Certification

Professional Affiliations

Western Dredging Association

Society of Toxicology and Chemistry

Professional Profile

Mr. Gene Revelas, senior consultant at Integral, is a leading sediment scientist with more than 35 years of experience working on benthic habitat assessments, environmental monitoring of offshore energy projects (both oil and gas and renewables), contaminated sediment remedial investigations and remediation, and dredged material quality evaluations and disposal site monitoring. He is one of the few North American scientists with extensive experience in the use of sediment-profile and plan view imaging (SPI-PV) technology for characterizing marine, estuarine, lacustrine, and riverine habitats. He has conducted SPI surveys since 1984 and he has applied this technology in freshwater and marine settings throughout the United States, Canada, and Mexico and in Europe. He leads Integral's SPI-PV practice and since 2015 has directed and been the science lead on approximately 30 SPI-PV surveys, including numerous environmental baseline surveys at offshore oil and gas and wind farm lease areas. From 2017 to 2020, he worked on the development of standardized benthic habitat mapping protocols for offshore wave energy sites off the U.S. West Coast using state-of-the-art seafloor acoustic (multibeam echosounder) and imaging (SPI-PV) technologies with funding from the U.S. Department of Energy.

Relevant Experience

Baseline Benthic Seafloor Habitat and Seafloor Characterization Assessment, Wind Energy Lease Area and Cable Routes, Continental Shelf Massachusetts Coast, Confidential Location—Science lead for the analysis and interpretation of more than 900 paired SPI-PV images collected in May, August, and November 2020 along planned and alternative export cable routes and an offshore wind farm lease area. Oversaw image collection; directed and performed senior quality assurance review of image analysis results and data evaluation, including benthic habitat classifications in accordance with Coastal and Marine Ecological Classification Standards (CMECS); also responsible for all technical reporting.

Baseline Benthic Seafloor Habitat and Seafloor Characterization Assessment, Wind Energy Lease Area and Cable Routes, Continental Shelf off of New Jersey, Confidential Locations—Science lead for the analysis and interpretation of 375 paired SPI-PV images collected in July 2020 along two export cable routes and an offshore wind farm



lease area. Oversaw image collection; directed and performed senior quality assurance review of image analysis results and data evaluation, including benthic habitat classifications in accordance with CMECS; and responsible for all technical reporting.

Standardized and Cost-Effective Benthic Habitat Mapping Tools for Marine and Hydrokinetic Site Environmental Assessments, United States—Under a contract with the U.S. Department of Energy, served as principal investigator of a 3-year study (2017 to 2020) to standardize and automate seafloor survey technologies for rapidly characterizing benthic habitat conditions across a range of environments. The concept is to integrate SPI–PV technology with well-established geophysical mapping techniques (e.g., multibeam bathymetry and acoustic backscatter) to develop effective and low-cost benthic habitat mapping protocols. A primary objective was the development and refinement of automated interpretation software that identify and measure key physical and biological indicators in the SPI–PV images and link them to geophysical maps so that habitat distinctions can be rapidly identified and delineated. This software is Integral’s *iSPI* innovative image analysis platform.

Multiple Environmental Baseline Study SPI–PV Surveys, Mexican Gulf of Mexico—Project manager and technical lead for 12 oil block lease area surveys and one pipeline route survey in the southern Gulf of Mexico from 2017 through 2018. Project proponents included Total, Exxon, BHP Billiton, the Mexican Petroleum Institute, Hokchi Energy, Petronas, Chevron, Deutsche Erdoel Mexico, Respol, Premier Oil, and British Petroleum. Conducted all project management duties including planning, scheduling, budgeting, and logistics; conducted senior quality assurance review of all SPI–PV image data; and served as primary author on all SPI–PV survey technical reports/deliverables.

Douglas Harbor Dredging and Disposal Site Monitoring, Juneau, Alaska—Project manager for the environmental monitoring associated with the dredging, disposal, and capping of 40,000 cubic yards of sediment from Douglas Harbor, Alaska. Conducted baseline, post-disposal, and post-capping SPI–PV surveys of the dredging and disposal sites, as well as water quality monitoring and sediment chemistry sampling during disposal. Effectively mapped the disposed dredged material mound and sand cap materials with SPI–PV technology, and analyzed and evaluated the project data set. A final construction monitoring report, including a 1-year post-construction survey, was completed in May 2017.

Deepwater Horizon, Gulf of Mexico—Worked in conjunction with the consulting team in responding to the Deepwater Horizon accident and oil spill in the Gulf of Mexico on behalf of BP Exploration & Production Inc. Science lead for several water column sampling cruises in 2010. Member of benthic technical working group from 2011 to 2014, which worked on assessing offshore benthic community impacts resulting from the Deepwater Horizon oil spill, including the design of the SPI–PV surveys that were conducted as part of that assessment.

Portland Harbor CERCLA RI/FS, Portland, Oregon—Remedial investigation technical lead for the Portland Harbor CERCLA sediment site. Responsibilities included overseeing all remedial investigation sampling activities, laboratory data analyses, and technical reporting. Also served as



task lead for assessing physical site conditions (i.e., hydrodynamics and sediment stability and sediment contamination nature and extent). As the remedial investigation data lead, responsible for coordinating the multimedia (hydrographic, sediments, water, tissues) sample collection activities of the RI/FS consultant team for this complex, 10-mile tidal riverine site; this included oversight of all sampling activities and laboratory data analyses. Designed an iterative approach to understanding sediment transport dynamics at the site using a combination of existing information, empirical data, and numerical modeling, and directed the remedial investigation reporting. Additional roles included budget preparation and tracking; planning and development of technical scopes of work; progress reporting, oversight, and quality assurance review of project deliverables; and preparation of technical products.

Western Port Angeles Harbor RI/FS, Port Angeles, Washington—As part of the RI/FS consultant team, designed a 2013 SPI–PV survey of the site to evaluate the impact of wood debris on benthic habitat quality and conducted a temporal comparison with SPI–PV image data that had been collected 15 years earlier.

West Bay and East Bay Sediment Characterizations, Olympia, Washington—Provided sediment expertise and strategic advice in the development a contaminated sediment dredging and disposal plan for the West Bay berth at the Port of Olympia. Primary role was to develop a dredged material/sediment testing and environmental monitoring plan to accompany the engineering and remediation plans for deepening the Port’s shipping berths (the West Dock), which were developed by Integral engineers.

Slip 4 (Duwamish River) Sediment Quality Evaluation, Seattle, Washington—Serve as project manager for a multiyear task order contract investigating sediment quality in Slip 4 and potential upland sources of the contamination. Compiled existing Slip 4 data and upland source tracing related to client properties and historical operations along this stretch of the Duwamish River. Provide technical and strategic support on the Lower Duwamish River CERCLA cleanup under this contract.

Former Oil Gasification Plant Site Assessment, Astoria, Oregon—Managed the sediment and resource evaluation portion of a site assessment in Youngs Bay, Oregon. The project consisted of an environmental evaluation of an intertidal coal tar deposit under Oregon Department of Environmental Quality oversight. The assessment included physical mapping of the deposit, evaluation of chemical pathways and potential ecological (including threatened and endangered species) and human health impacts, and evaluation of the potential environmental impacts associated with various remedial alternatives.

U.S. Army Corps of Engineers, Marine Sediment Sampling, Chemical and Biological Analyses in Western Washington—From 1995 to 2002, managed task order projects, including numerous dredged material characterizations under the Dredged Material Management Program for sites in Puget Sound, Grays Harbor, and Willapa Bay. Prepared a Programmatic Environmental Impact Statement for the interagency Puget Sound Confined Disposal Study on multiuser disposal sites; conducted a site sediment quality assessment for habitat restoration in the Duwamish River;



conducted multiyear crab population studies at the mouth of Grays Harbor; led an extensive laboratory bioaccumulation study in the East Waterway; monitored water quality during contaminated sediment dredging in the East Waterway; and assessed paralytic shellfish poisoning issues associated with dredging/disposal in Bellingham Bay.

Portland Harbor Environmental Consulting Contract, Oregon—Managed this task order contract with the environmental division of the Port of Portland from 2000 to 2002. Tasks were focused on contaminated sediment issues in Portland Harbor (e.g., historical data compilation, source evaluation, work plan development) in anticipation of a CERCLA listing of the site.

Hylebos Waterway Pre-remedial Design, Tacoma, Washington—Major involvement in the comprehensive sediment characterization portion of the Hylebos Waterway pre-remedial design program from 1994 to 1997. Responsibilities included coordination and oversight of coring activities and core sample analyses; data analyses, including Puget Sound Dredged Disposal Analysis (PSDDA) and natural recovery assessments; and technical reporting. Also directed a sediment profile survey of entire waterway and synthesized this information with traditional chemical and biological data sets.

Salmon Net Pen Benthic Standards for Puget Sound, Washington—Under contract to the Washington State Department of Ecology from 1994 to 1996, developed standards for evaluating the benthic impacts of salmon aquaculture in Puget Sound. Work included analysis and synthesis of several years of net pen monitoring data and development of effects criteria that were incorporated into an industry-wide net pen regulatory framework.

Contaminated Sediments Section, Washington Department of Natural Resources (DNR), Washington—While employed at DNR in 1993, managed the Contaminated Sediments section at DNR's Division of Aquatic Lands. This section's responsibility is the environmental review/assessment of projects/programs affecting state-owned aquatic lands. Major tasks included technical review of RI/FS and remedial design documents for federal and state Superfund sites, participation on interagency technical panels evaluating proposed sediment remediation activities, and the refinement and development of sediment quality assessment techniques.

Puget Sound Dredged Disposal Analysis, Washington—Managed the PSDDA program for DNR from 1991 to 1994. PSDDA is a federal/state interagency program for managing dredged material and disposal in the Puget Sound region. Responsibilities included sediment sampling plan and data report review, technical direction of biological and chemical monitoring studies at the open-water dredged material disposal sites, and evaluation procedures technical review. As a consultant prior to joining DNR, directed PSDDA disposal site physical, chemical, and biological monitoring (1990 to 1991) and participated in PSDDA disposal site baseline (1988 to 1989) and zones of siting feasibility studies (1985).

U.S. Navy Homeport Project, Everett, Washington—From 1987 through 1989, acted as assistant program manager for the environmental monitoring/dredged material testing program associated with construction of the Everett Naval Base. Coordinated collection and analysis of baseline



environmental data at a deep-water disposal site and directed the Element I dredged material sediment characterization.

Alcatraz Disposal Site Study, San Francisco, California—In 1986 and 1987, served as chief field scientist for a multiyear study designed to assess the behavior of dredged material disposed at the Alcatraz site as a function of dredging and disposal techniques. Field techniques included current measurements, bathymetric and acoustic subbottom profiling, side scan sonar, sediment-profile photography, and deep sediment coring. Participated in data analysis and coauthored project technical reports.

San Francisco Bay Sediment Quality Investigation, California—Conducted a San Francisco Bay sediment quality survey and analyses for the National Oceanic and Atmospheric Administration in 1986. Led field, data management, and report preparation efforts. Program involved conductivity-temperature-depth profiling, sediment profile imaging, and sediment analyses throughout the estuary.

Sediment-Profile Image Surveys, United States, Canada, Europe—Since 1984, technical lead on numerous sediment-profile surveys of coastal, estuarine, and riverine areas throughout the U.S. and Canada and in Europe. These surveys delineated areas of benthic disturbance and potential degradation. The SPI results are used to monitor conditions at aquatic disposal sites such as the PSDDA sites, evaluate remedial efforts (in-place capping and confined aquatic disposal sites), map coastal enrichment gradients and benthic habitat quality, and optimize follow-on conventional sediment sampling programs.

Publications

Egan, G., G. Chang, S. McWilliams, G. Revelas, O. Fringer, and S. Monismith. 2021. Cohesive sediment erosion in a combined wave-current boundary layer. *J. Geophys. Res.* 126(2). doi: 10.1029/2020JC016655.

Egan, G., G. Chang, G. Revelas, S. Monismith, and O. Fringer. 2020. Bottom drag varies seasonally with biological roughness. *Geophys. Res. Lett.* 47, e2020GL088425. <https://doi.org/10.1029/2020GL088425>.

Revelas, E.C., B. Sackmann, N. Maher, and C. Jones. 2020. Mapping of benthic habitats at marine renewable energy sites using multibeam echosounder and sediment profile imaging technologies. Proceedings of the Offshore Technology Conference, Houston, TX.

Revelas, E.C., B. Sackmann, A. Thurlow, and C. Jones. 2018. Mapping benthic habitat conditions and seafloor deposits using sediment profile imaging and a semiautomated image processing system. In: Proc. of the Offshore Technology Conference, April 30–May 3, Houston, TX.

Revelas, E.C., and L. Jones. 2016. Key technical approaches to the Portland Harbor remedial investigation. In: Proc. of the WODCON XXI Conference, Miami, FL.



Dasler, J.L., E.C. Revelas, and J.C. Creech. 2003. Sediment transport mapping in a complex riverine environment using multibeam bathymetry. In: Proc. of the 2003 U.S. Hydrographic Conference. Biloxi, MS.

Browning, D.G., and E.C. Revelas. 1996. Development and application of the physical disturbance index (PDI) for sediment profile images. In: PERS, Pacific Northwest Chapter Proc., Olympia, WA.

Revelas, E.C., D.R. Kendall, E.E. Nelson, D.C. Rhoads, and J.D. Germano. 1991. Post-disposal mapping of dredged material in Port Gardner and Elliott Bay. In: Proc. of Puget Sound Research '91. Puget Sound Water Quality Authority, Olympia, WA. pp. 267–280.

Revelas, E.C., J.D. Germano, and D.C. Rhoads. 1987. REMOTS: Reconnaissance of benthic environments. In: Proc. of the Coastal Zone '87 Meeting, May 26–29, 1987. ASCE, Seattle, WA. pp. 2069–2083.

Revelas, E.C., D.C. Rhoads, and J.D. Germano. 1987. San Francisco Bay Sediment Quality Surveys and Analyses. NOAA Technical Memorandum NOS OMA 35, Rockville, MD.

Rhoads, D.C., E.C. Revelas, and J.D. Germano. 1986. Development of a UV fluorescence imaging system for *in-situ* detection of petroleum in marine sediments. In: Offshore Technology Proc., Houston, TX. pp. 441–445.

Rhoads, D.C., R.A. Lutz, R.M. Cerrato, and E.C. Revelas. 1982. Growth and predation activity at deep-sea hydrothermal vents along the Galapagos rift. *J. Mar. Res.* 40:503–516.

Rhoads, D.C., R.A. Lutz, E.C. Revelas, and R.M. Cerrato. 1981. Growth and predation activity at deep-sea hydrothermal vents along the Galapagos rift. *Science* 214:911–913.

Presentations/Posters

Sackmann, B., G. Revelas, K. Whitehead, C. Schultz, and C. Jones. 2020. Artificial intelligence and computer vision for cost-effective benthic habitat characterizations. Poster presentation at the Ocean Sciences Meeting. Co-sponsored by the American Geophysical Union, the Association for the Sciences of Limnology and Oceanography, and The Oceanography Society, San Diego, CA. February 16–21.

Whitehead, K., D. Nielsen, B. Sackmann, M. Macrander, G. Revelas, and D. Preziosi. 2020. Determination of sediment impacts due to exploratory oil operations using likelihood based statistics. Poster presentation at the Ocean Sciences Meeting. Co-sponsored by the American Geophysical Union, the Association for the Sciences of Limnology and Oceanography, and The Oceanography Society, San Diego, CA. February 16–21.

Revelas, E., B. Sackmann, and C. Jones. 2019. A streamlined and standardized benthic habitat mapping approach for marine and hydrokinetic site environmental assessments. Poster presentation at 7th Annual Marine Energy Technology Symposium, Washington, DC. April 1–3.



- Browning, D., G. Revelas, and B. Jaworski. 2019. A power sediment-profile image camera system for effective profile imaging of firm substrates. Platform presentation at Tenth International Conference on the Remediation and Management of Contaminated Sediments, New Orleans, LA. February 11–14.
- Sackmann, B.S., E. Revelas, K. Whitehead, D. Nielsen, C. Jones, and J. Durda. 2019. Using artificial intelligence and computer vision for cost-effective environmental monitoring and site characterization. Poster presentation at Tenth International Conference on the Remediation and Management of Contaminated Sediments, New Orleans, LA. February 11–14.
- Sackmann, B., E. Revelas, and C. Jones. 2018. Standardized and cost-effective benthic habitat mapping tools for marine and hydrokinetic site environmental assessments. Poster presented at 6th Annual Marine Energy Technology Symposium, Washington, DC. April 30–May 2.
- Revelas, E.C., B. Sackmann, I. Stupakoff, and C. Jones. 2018. Standardized and cost-effective benthic habitat mapping tools for marine and hydrokinetic site environmental assessments. Oral presentation. Marine Geological and Biological Habitat Mapping (GeoHab) Conference. Santa Barbara, CA. May 7–11.
- Martin, T., C. Jones, and G. Revelas. 2017. A novel approach to performance monitoring at sediment megasites. Sediment Management Work Group Fall Sponsor Forum, Charleston, SC. September 27–28.
- Revelas, E., B. Sackmann, and I. Stupakoff. 2017. Mapping disposed dredged material and a sand cap for the Douglas Harbor dredging project (Juneau, Alaska) using sediment profile imaging and a semiautomated image processing system. Ninth International Conference on Remediation of Contaminated Sediments, New Orleans, LA. January 9–12.
- Revelas, G., and B. Day. 2016. Thirty years of sediment cleanup under CERCLA and MTCA. Environmental Cleanup Conference, Environmental Law Education Center, Seattle, WA. September 19.
- Revelas, G., and B. Day. 2015. Monitoring benthic habitat recovery using sediment-profile imaging technology. Eighth International Conference on Remediation of Contaminated Sediments, New Orleans, LA. January 12–15.
- Revelas, G., and B. Day. 2015. Port Angeles Harbor RI/FS: Sediment-profile image/plan view survey results and benthic habitat assessment. Eighth International Conference on Remediation of Contaminated Sediments, New Orleans, LA. January 12–15.
- Day, B., G. Revelas, W. Bloor, D. McKean, and N. West. 2015. Challenges for a small city with a big sediment cleanup site: Port Angeles, Washington. Eighth International Conference on Remediation of Contaminated Sediments, New Orleans, LA. January 12–15.



Nielsen, D., K. Whitehead, B. Sackmann, and G. Revelas. 2014. Determination of community impairment due to multiple stressors using likelihood ratios to integral lines of evidence. Joint Aquatic Sciences Meeting, Portland, OR.

Revelas, E.C., H. Hu, R. Walton, and J. Hamrick. 2009. Sediment transport assessment in a large, tidal river (Portland Harbor, Oregon). Fifth International Conference on Remediation of Contaminated Sediments, Jacksonville, FL. February 2–5.

Hu, H.H., R. Walton, E.C. Revelas, and J. M. Hamrick. 2007. Two-dimensional hydrodynamic and sediment transport modeling of the Lower Willamette River, OR. Environmental & Water Resources Engineering Conference (ASCE), Tampa, FL. May 15–19.

Revelas, E.C. 2006. Portland Harbor Superfund site technical update. Environmental Cleanup Conference, Environmental Law Education Center, Portland, OR. March 13.

Revelas, E.C., and D.G. Browning. 2005. The use of sediment-profile imaging for contaminated sediment assessment: Pacific Northwest harbor and river examples. SETAC North America 26th Annual Meeting, Baltimore, MD. November 13–17.

Revelas E.C., S.M. Fitzgerald, and J.L. Dasler. 2005. Assessing sediment stability in a riverine environment for the Portland Harbor RI/FS. In: Proceedings of the Third International Conference of Remediation of Contaminated Sediments, New Orleans, LA. January 24–27.

Revelas, E.C. 2004. Physical conceptual site model development in a dynamic river environment: A sediment RI/FS first step. Fourth SETAC World Congress, Portland, OR. November 14–18.

Revelas, E.C. 2004. Defining the nature and extent of contamination in Portland Harbor, Western Dredging Association (Pacific Chapter) Conference, Portland, OR. October 27–29.

Browning, D., E.C. Revelas, R.C. Hollar, and A. Risko. 1996. Confined disposal and capping of dredged sediments in the Long Beach borrow area. In: Proc. WEDA Pacific Chapter, Honolulu, HI.

Browning, D., D.R. Kendall, and E.C. Revelas. 1993. Delineation and biogenic reworking of a dredged material deposit placed at a deep water disposal site. In: Proc. Pacific Northwest Chapter SETAC, Seattle, WA.

