

Highlights

Over 45 years of experience addressing complex challenges facing our rivers, coasts, wetlands, and groundwater—with a passion for innovation in risk-based decisions.

Flood Hydrology

- Eight major reports on New Orleans post-Katrina regional storm surge hazard and risk reduction, including *first-in-the-nation* applications of high-resolution High Performance Computing modeling of Katrina breaches, future breach scenarios, and regional risk-reduction alternatives.
- Ten major reports on Amite River Basin flooding over a period of 40-plus years; most recently the post-2016 Flood evaluation and the *first-in-the-nation* online High-Definition Flood Inundation Map. The regional 2016 Flood was the nation's 4th most expensive at the time.
- Central Louisiana multi-parish regional water resource planning study.
- Investigation of a 1983 Mississippi River bank failure for a Superfund Site near Darrow, Louisiana.
- Scoping reports for a new FEMA coastal flood study for northwest Florida/Georgia to leverage rapidly evolving HPC modeling.

Environmental Hydrology

- Detailed hydraulic feasibility study for a Mississippi River diversion to restore the Maurepas Swamp. Included the *first-in-the-nation* application of high-resolution HPC modeling of shallow wetland circulation to evaluate short-circuiting, retention time for denitrification, and upstream flood impacts.
- Advanced research on low-turbulence wetland hydrodynamics.
- Post-Katrina analyses for Lake Pontchartrain tidal circulation with proposed restriction of tidal passes.
- Investigations into chlorinated solvent, petroleum, and wood-treating chemical contamination of groundwater at dozens of industrial locations and Superfund sites.
- Remediation plans for industrial impoundments and other groundwater and surface water contamination sources, including *first-in-the-nation* bio-remediation for a Superfund site.
- Remediation plans for contaminated estuarine waterbodies incorporating sophisticated quantitative characterization of ecological risks and risk reduction alternative.
- Assessments for upgrading wastewater and stormwater management at several refineries and petrochemical plants.

Leadership and Innovation

- Creating **Real Flood Resilience L3C** to provide the **Real Flood Re\$ilience** public information service.
- Entrepreneur/owner of engineering firms for 15 years.
- Profit center, business line, department, and project manager roles for national engineering and construction firms.
- Led efforts on behalf of numerous corporations and their legal/financial teams, federal/state/local agencies, and professional colleagues at all levels from varying disciplines.
- Mature sensitivity to the dynamics of both environmental sustainability and client priorities—balancing the application of rapidly evolving methods with practical demands in optimizing highly sensitive risk-based decisions.
- Prepared a study leading to the 1995 reorganization of Louisiana Department of Environmental Quality.
- Led the Centennial Celebration of the American Society of Civil Engineers Louisiana Section.
- Given numerous presentations for a wide range of audiences; provided expert commentary for many national and regional media stories on Louisiana water issues.
- An enthusiast for advancing the professional practice for numerous aspects of flood and environmental information and applied science, as well as environmental remediation technology
- Authored several publications on risk-based approaches to flood and environmental challenges.

Flood Hydrology

Bob's work in coastal and riverine flooding over the last two decades has advanced the state-of-the-practice in 2D modeling, GIS technology, as well as hazard and risk analysis for hurricane storm surge and river flooding.

New Orleans Region

- *Preliminary 2D Hydraulic Feasibility Evaluation of Bayou Bienvenue Sector Gate Diversion of IHNC Basin Flood Water into the Central Wetlands*, Southeast Louisiana Flood Protection Authority—East, author (2018).
- *Hydraulic Analysis for SLFPA-E HSDRRS Gate Failures*, Southeast Louisiana Flood Protection Authority—East, author (2016).
- *New Orleans East-Bank Hurricane Surge Residual Risk Reduction Report*, Southeast Louisiana Flood Protection Authority—East, author (2016); included the *first-in-the-nation* high-resolution High Performance Computing modeling of breach scenarios to support evaluation of risk reduction alternatives.
- *Four Priority Issues with the USACE Surge Hazard and HSDRRS Overtopping Analysis*, Southeast Louisiana Flood Protection Authority—East and Louisiana Coastal Protection and Restoration Authority, author (2015).
- *Hurricane Surge Hazard Analysis: The State of the Practice and Recent Applications for Southeast Louisiana*, Southeast Louisiana Flood Protection Authority—East and Louisiana Coastal Protection and Restoration Authority, author (2013).
- *The Direct Impact of the Mississippi River Gulf Outlet (MRGO) on Hurricane Surge*, Louisiana Coastal Protection and Restoration Authority (then Department of Natural Resources), author (2006).
- *Interaction of Hurricanes and Coastal Landscape Features: A Literature Review*, US Army Corps of Engineers, co-author (2006).
- *Alliance Louisiana Refinery Storm Surge Analysis*, Conoco-Phillips, author (2006).

Amite River Basin

- *High-Definition Flood Inundation Map for the August 2016 Flood, Version 1 Desktop*, Amite River Basin Commission, author (2022); the *first-in-the-nation* online HD-FIM; the regional 2016 Flood was the nation's 4th most expensive at the time.
- *August 2016 Flood Preliminary Report*, Amite River Basin Commission, author (2017).
- *August 2016 Flood High Water Mark Survey*, Amite River Basin Commission, author (2016).
- *Amite River Diversion Canal Swamp Restoration, Hydrology and Hydraulics Report*, Louisiana Coastal Protection and Restoration Authority, co-author (2010).
- *Amite River Basin Ecosystem Restoration Feasibility Study Hydrology and Hydraulics Report*, Pontchartrain Levee District, co-author (2010).
- *Bayou Manchac Flood Risk Reduction Feasibility Study, Hydrology and Hydraulics Report*, Pontchartrain Levee District, co-author (2009).
- *Comite River Watershed Modeling Phase 1 Study*, Amite River Basin Commission, co-author (2008).
- *Amite River Basin Floodplain Management Plan*, Amite River Basin Commission, author (2006).
- *Amite River Basin Flood Mitigation Plan*, Federal Emergency Management Agency, co-author (2004).
- *Evaluation of Livingston Parish Roads following 1983 Flood*, Alvin Fairburn & Associates for Livingston Parish, assisted (1983).

Other Louisiana

- *Mississippi River Reintroduction into Maurepas Swamp*, Louisiana Coastal Protection and Restoration Authority (then Department of Natural Resources), author (2006); addressed the flooding impact of diversion with a *first-in-the nation* linked analysis of 1D modeling for upstream community gravity drainage with the 2D diversion modeling, including for Lake Maurepas storm surge events.
- Evaluation of the 1983 Mississippi River levee failure near Darrow Louisiana, *Old Inger Superfund Site Remediation Feasibility Study*, Louisiana Department of Environmental Quality, author (1984).
- *Central Louisiana Regional Water Resource Study*, Kisatchie-Delta Regional Planning District, author (1982).

Other Regions

- *Technical Assistance for Hazard Mitigation*, Winchester VA FEAM Consolidated Resource Center, reviewed a wide range of infrastructure repairs throughout the Midwest (2018-19).
- *Surge Study Needs Analysis, Florida and Georgia: I. Land Use and Other Significant Features and II. ADCIRC Model Requirements*, Federal Emergency Management Agency, Flood Insurance Study, Preliminary Phase, author (2010).

Environmental Hydrology

During the first half of his career, Bob worked on a wide range of environmental projects serving corporate and government clients, including some of the earliest contamination remediation efforts at petroleum refineries, chemical plants, pulp and paper mills, wood treating facilities, alumina refineries, aluminum factories, steel works, electric and gas utilities, military installations, and Superfund sites.

Later his work encompassed environmental restoration of waterways and wetlands.

His work has addressed advances in water- and sediment-borne chemical fate, transport, and human health and ecological risk sciences; pollution control, remediation, and restoration technologies; and federal and state environmental programs.

Surface Water and Wetlands

- *Doctoral Research on Low-Turbulence Wetland Hydrodynamics*, (2009-2012); ; featuring *first-in-the-nation* flume experiments on low Reynold's Number conditions at steady-state and dynamic flows, with varying bottom roughness and obstructions.
- *Mississippi River Reintroduction into Maurepas Swamp*, Louisiana Coastal Protection and Restoration Authority (then Department of Natural Resources), author (2007); a detailed hydraulic feasibility study for a proposed Mississippi River diversion into the Maurepas Swamp. Included the *first-in-the-nation* application of high-resolution HPC modeling of shallow wetland circulation to evaluate short circuiting and retention time for denitrification.
- *Assessing Baseline and Modified Astronomical Tide Propagation in the Pontchartrain Basin Using ADCIRC*, US Army Corps of Engineers, author, (2007); *first-in-the-nation* detailed harmonic analysis of tidal constituents in the Pontchartrain Basin (including over 110 time series from 40 gages), featuring an evaluation of the capability of the high-resolution HPC ADCIRC model to replicate regional tidal propagation in the large, complex estuary; analyzed the model's capability to assess the impact of post-Katrina proposed pass closure structures on tidal circulation.
- *Bayou Remediation and Restoration Feasibility Study*, Southeast Louisiana Refinery, project manager (2003); remediation engineering of two miles of petroleum-contaminated sediments in a designated coastal estuarine scenic bayou; the project was being addressed under a federal NRDA and state CERCLIS action (Louisiana).
- *Total Maximum Daily Load (TMDL) Study*, Southwest Louisiana Regional Industrial Task Force, co-author (2002); detailed review of TMDL water quality investigations prepared by the USEPA and LDEQ for a variety of pollutants including nutrients, heavy metals, and organic toxics for a major Gulf of Mexico estuary; included critiques of an integrated 2-D water quality model of DO and nutrient uptake in the estuary; as a result of this work, proposed TMDLs for the estuary were significantly modified.
- *Remedial Investigations/Feasibility Studies of Contaminated Waterbodies*, Industrial Clients, support (1995 - 2002); work addressed scope, fate, transport and long-term risks to sensitive wetland ecosystem indicator species, under a range of alternative measures, for mercury, heavy metal, pesticide, and chlorinated hydrocarbon contamination.
- *Chlorinated Hydrocarbon Contaminated Sediment Remediation*, Southwest Louisiana, manager (1991); hydraulic dredging of heavily contaminated sediments from a channeled portion of the Calcasieu River near a facility loading dock.
- *Delineation of Coastal Marsh Land Loss*, Gas Pipeline Company, support, (1983); digitized land change for pre- versus post-construction of gas pipeline through brackish water marsh.

Groundwater

- *Manual for Designing Cost-Effective Risk-Based Groundwater Remediation*. Louisiana Chemical Association, author (1997); a manual to address the selection and optimization of groundwater remediation through the application of health/environmental risk analysis; reviews analytical and numerical models for evaluating groundwater remediation design variables.
- *Groundwater Investigations*, Multiple Clients, manager/support (1983–88); conducted groundwater hydrology, quality, and contamination investigations for a wide range of contaminants—petroleum hydrocarbons, chlorinated solvents, pesticides, PCBs, dioxins, and heavy metals, including floating and dense non-aqueous phase liquid (DNAPL). Activities included installation and sampling of piezometers, monitoring wells, pump tests, flow/transport/fate modeling, risk assessment, remediation planning, horizontal wells, remediation, pump-and-treat, and intrinsic and in-situ bio/chemical remediation. Many of these activities involved *first-in-the-nation* technical approaches—such as DNAPL pump tests and recovery, 2D groundwater modeling, and plans for horizontal wells.

Wastewater/Stormwater/Waste Management

- *Industrial Stormwater System Upgrades*, Multiple Petroleum Refineries and Chemical Manufacturing Plants, manager/author (1997–2007); engineering analysis of design storms and analysis, conveyance system/transfer/storage/treatment capacity to address changing site conditions and/or discharge limits.
- *Industrial Wastewater Treatment System Upgrades*, Multiple Petroleum Refineries and Chemical Manufacturing Plants, manager/author (1997-2007); engineering analysis of design storms and analysis of physical, chemical, and biological treatment systems to address changing load conditions and/or stricter discharge limits.
- *Wastewater System Nitrate Study*, Louisiana Petroleum Refinery Complex, author (1997–98); detailed study of nitrogen sources and cycling — nitrification and denitrification — for a significant ammonia/nitrate point source to the Mississippi River; evaluated alternatives for denitrification consistent with expected kinetics of nitrate removal.
- *Stormwater System Remediation Design/Construction*, Petroleum Refinery, manager (1998–2001); a multi-million-dollar environmental remediation project for three wastewater surface impoundments; exceeded design objectives and was completed under budget.
- *Surface Impoundment and Buried Waste Remediation*, Multiple Active and Abandoned Sites, manager/support (1984–98); more than 20 remediation feasibility studies (including RCRA and CERCLA sites); identifying, screening, and evaluating alternatives, and preparing conceptual designs; rigorous application of recognized and innovative approaches to risk, safety, effectiveness, cost, schedule, constructability, logistics, and other issues. As an example, served as a senior consultant for a project to hydraulically dredge several hundred thousand cubic yards of contaminated sediments and transfer to a slurry processing operation for multi-phase mechanical dewatering and stabilization prior to shipment offsite.
- *Old Inger Superfund Site Feasibility Study*, Louisiana Department of Environmental Quality, author (1984); remediation of an abandoned waste oil refinery located on the Mississippi River near Darrow, Louisiana; study was the *first-in-the-nation* approved by the US Environmental Protection Agency for biodegradation as the primary remediation technology.
- *Solid Waste Landfill Siting Studies*, for Rapides Parish, Kisatchie-Delta Regional Planning District, and for Livingston Parish, Alvin Fairburn & Associates, support (1982).
- *Environmental Permit Requirements for a Proposed Grassroots Ethanol Plant*, FC Schaffer & Associates, author (1981).
- *Delegation of the Federal RCRA Hazardous Waste Management Program*, Louisiana Department of Environmental Quality, then Dept of Natural Resources, Office of Environmental Affairs (1980-81).

Leadership

Bob has decades of management experience at the office, program, and project levels for environmental/coastal engineering/construction firms. Over the years he's exhibited a mature sensitivity to the dynamics of both environmental sustainability and client near- and long-term priorities—balancing the application of rapidly evolving methods with practical demands in optimizing highly sensitive risk-based decisions.

Bob has worked with numerous corporations and their legal/financial teams, federal/state/local agencies, professional colleagues at all levels from varying disciplines, as well as citizen stakeholders.

Entrepreneur/Business Owner

- In 2024 started **Real Flood Resilience L3C** –a low-profit LLC—to provide the **Real Flood Re\$ilience** information service dedicated to improving due diligence for all property stakeholders by providing timely, practical information to better characterize a property's flood hazard and price its flood risk.
- Since 2011 has provided flood hydrology engineering services through **Bob Jacobsen PE LLC**. Major clients have included the Southeast Louisiana Flood Protection Authority East, the Louisiana Coastal Protection and Restoration Authority, the Amite River Basin Commission, and the Federal Emergency Management Agency.
- From 1998–2000 provided environmental hydrology engineering services through his firm **EnviroValue LLC** during which time he managed multi-million dollars in remediation projects for industrial clients.

Profit Center, Business Line, and Project Management

- Held/overseen the full range of organizational responsibilities for several national environmental firms, including business planning, profit/loss, cash flow, business development/marketing, IDIQ and project contract negotiation, human resources/recruitment, subcontracts/vendors, and quality/satisfaction assurance.
- In 1989 founded and managed a Gulf Coast regional office for an environmental remediation division of a Fortune 50 firm. Under his management, the profit center grew to a staff of over 50, successfully performed over \$20 million in large-scale remediation construction projects, with 1991 revenues reaching over \$1 million per month, and led the division in profitability and cash flow performance.
- In 2002 initiated the Louisiana coastal restoration business practice for a nationally prominent engineering firm. Over five years managed the multi-million-dollar study/design contract for the first state-directed Mississippi River diversion project and several IDIQ contracts and task orders.
- Expertise in appropriate application of advanced professional-level approaches to: investigations, data collection/management/quality, GIS, modeling, feasibility studies, risk assessment, permitting/impact studies, economic evaluation, design, and construction.
- A dozen years of experience in managing large, administratively complex, multi-million-dollar environmental remediation projects. Experience includes rigorous operational demands posed by a multitude of requirements: regulatory, worker/public exposure to toxic contamination, material handling technology, logistics, seasonal conditions, schedule, multiple-owners, and detailed accounting and cash-flow requirements.

Government Policy

- Regularly attended Amite River Basin Commission meetings (2002 to 2022) and Southeast Louisiana Flood Protection Authority—East meetings (2008 to 20106) and provided comments on flood events and flood hazard and risk issues.
- Based on his broad environmental and management background, contracted in 1995 by the Louisiana Department of Environmental Quality to prepare a comprehensive management survey to document the LDEQ organization, functions and legal program mandates, personnel resources, expenditures, revenues, and total quality management programs. The project responded to mounting concerns for LDEQ fiscal and programmatic accountability. He presented findings to the 1995-96 LDEQ Transition Team. LDEQ was subsequently reorganized along functional lines.
- In 1995 served as environmental policy advisor to gubernatorial candidate.
- Served on trade association environmental review teams during gubernatorial transition.
- In 1980-81 worked as an assistant to the Director of Policy and Program Development of the Louisiana Department of Environmental Quality (the Department of Natural Resources, Office of Environmental Affairs) on the delegation of the federal RCRA Hazardous Waste Management Program.

Professional Organization

- American Society of Civil Engineers 2008 Baton Rouge Branch President.
- American Society of Civil Engineers 2014 Louisiana Section President.
- 2010 Recipient of the ASCE Baton Rouge Branch Outstanding Civil Engineer Award.
- In 2014 as ASCE Louisiana Section President, led activities celebrating the Section's Centennial Anniversary, including the Gala Honoring the State of Louisiana's Top Civil Engineering Achievements.

Innovation

Bob's distinctive course of education—two master's degrees from LSU concentrating in environmental policy and environmental engineering, and subsequent doctoral courses and research on estuarine hydrodynamics—enhanced a unique set of analytical skills and contributed greatly to his career path,

Over his 40-year career, Bob has been an enthusiast for advancing the professional practice for risk-based resolution of environmental challenges.

Flood and Environmental Information and Applied Science

Bob has participated in and promoted the early exploration and adoption of:

- Property-specific flood financial risk for due diligence (2020-present)
- High-Definition (High Resolution/High Accuracy) Flood Inundation Maps (2019-22)
- High-Resolution 2D Modeling (HEC-RAS) for wetland circulation (2018)
- Joint Probability Methods in Flood Hazard Analysis (2006-16)
- Low turbulence flow in wetlands (2006-12)
- High-Resolution/HPC 2D Modeling (ADCIRC) for tides (2006)
- High Resolution/High Performance Computing 2D Modeling (ADCIRC) for hurricane surge (2005-2016)
- High-Resolution/HPC 2D Modeling (ADCIRC) for wetland circulation (2004-07)
- Geographical Information Systems (1992-present)
- Wetland ecological risk assessment for toxic chemicals
- Relational database for managing nationwide multi-site remediation (1995)
- Methods for conducting feasibility studies for remediation of contaminated sites (1984-87)
- 2D DNAPL migration pathways (1983-85)
- 2D groundwater flow modeling (1983-84)
- Requirements for safely storing and disposing of hazardous waste (1980-84)

Remediation Technology

Bob has also participated in and promoted the early exploration and adoption of environmental remediation technologies:

- Intrinsic groundwater remediation (1996)
- Horizontal wells for recovery of contaminated groundwater (1995)
- Onsite mobile processing (mechanical and thermal) of impoundment sediments (1989-2004)
- Bio-remediation of hydrocarbon contaminated solids (1984-91)
- Investigation of subsurface DNAPL migration (1983-85)

Productivity

Like many in his generation, Bob has enjoyed the many advances in general productivity tools: from the era of slide rules, typewriters, (and literal “cut and paste”), special log paper, paper ledgers, carousels of 35 mm slides, primitive fax machines, “snail mail,” “Yellow Pages Ads,” and “bag phones,” to today’s world of networked multi-core computers and smart phones with amazing word processing, spreadsheet, presentation, email, video conferencing, and website development applications. Bob has been eager to learn and share each step of progress (word processing his master’s thesis in 1981), and as a business manager to advocate, fund, and leverage them.

Timeline

Education

- Louisiana State University, Coursework and research toward a PhD in Civil Engineering on low turbulence hydrodynamics.
- Louisiana State University, M.S., 1994, Civil (Environmental) Engineering.
- Louisiana State University, M.A., 1981, Political Science (Environmental Policy).
- Louisiana State University, B.S., 1977, General Studies (Engineering and Economics).

Employment History

- Office of Environmental Quality—Louisiana Department of Natural Resources, now LDEQ, intern (1980-81).
- FC Schaffer & Associates (1981).
- Kisatchie-Delta Regional Planning District (1982).
- Alvin Fairburn & Associates, part-time (1982-83).
- Aero-Data Corp, part time (1982).
- D'Appolonia Engineering/IT Corporation, now APTIM (1983-88).
- Westinghouse Environmental Services, no longer in business (1988-1991).
- Aero-Data Corp (1991-92).
- Parsons Corporation (1992-1994).
- OHM Remediation Services (1984)
- Woodward-Clyde Consultants, part-time (1994-95).
- Contractor to LDEQ (1995).
- CK Associates (1996-1998).
- EnviroValue LLC, owner (1998-2000).
- URS Corporation, now AECOM (2001-07).
- Taylor Engineering (2007-2011).
- Bob Jacobsen PE, LLC, owner (2011-present).

Professional Registration and Affiliations

- Professional Environmental Engineer (1998-Louisiana).
- American Society of Civil Engineers (1997-present).

Publications and Presentations

Publications

- *Twenty Years After Katrina—Ten Fundamental Flood Ri\$k Lessons We Must Finish Learning*, Louisiana Civil Engineer (2025).
- *Property-Specific Flood Ri\$k, Part I: The Flood Ri\$k Glossary*, Louisiana Civil Engineer (2022).
- *Property-Specific Flood Ri\$k, Part II: The Property-Specific Flood Ri\$k Revolution*, Louisiana Civil Engineer (2022).
- *Hurricane Surge Hazard Uncertainty in Coastal Flood Protection Design*, The Journal of Dam Safety Vol 13, Issue 3 (2015).
- *Hurricane Surge Hazard Primer* (2016).
- *Managing Hurricane Surge Risks in the Supercomputing Era Part I: Pre-Katrina Evolution of Surge Hazard Estimation and Risk Management*, Louisiana Civil Engineer (2015).
- *Managing Hurricane Surge Risks in the Supercomputing Era Part II: Post-Katrina Progress and Limitations in Surge Hazard Estimation and Implications for Surge Risk Management*, Louisiana Civil Engineer (2015).
- *Designing Cost-Effective Risk-Based Groundwater Remediation—A Manual for Applications Involving Shallow Organic Solute Contamination in Louisiana*, Louisiana Chemical Association (1997).

Example Public Presentations

- *21st Century Flood Ri\$k Wisdom* (eight videos) (2022).
- *The August 2016 Flood—90 Days of Headlines in The Advocate, Parts I and II* (2017)
- *The August 2016 Amite River Basin Flood—Context & Challenges, Parts I, II, III, and IV* (2017)
- *Workshop on Improving Amite River Basin Flood Forecasting and Hazard Analysis* (2016 and 2017 Organizer).
- *Hurricane Katrina 10th Anniversary Short Course* (2015).
- *Twenty Years After Katrina—Ten Fundamental Flood Ri\$k Lessons We Must Finish Learning*

Given presentations to a range of professional, business, governmental, and citizen audiences:

American Society of Civil Engineers (Baton Rouge)
Amite River Basin Commission
Association of State Floodplain Managers
Baton Rouge Geological Society
California Flood Hub
Center for Planning Excellence
Environmental Business Council of New England
Houston Geological Society
Louisiana Engineering Society
Louisiana Floodplain Management Association
Louisiana Geological Survey
Louisiana State of the Coast Biannual Conference
LSU College of the Coast & Environment Seminar Series
LSU Marine Extension Program
Louisiana Urban Stormwater Coalition
Sierra Club of Baton Rouge
St. Bernard Economic Development Foundation
Together Baton Rouge
Tulane Engineering Forum