

HELEN LOWE
The Crows Nest, 28 Frome Valley Road,
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Email: hj.lowe@enviromud.co.uk

I am an enthusiastic, passionate and qualified applied marine scientist with over 30 years of experience, specialising in sedimentology and with a background in chemistry and oceanography. I am innovative and logical with an outgoing personality and a can-do attitude. I am comfortable applying myself in the field, laboratory and office environment, but my passion is measuring and understanding cohesive sediments within in hydraulic settings. I am highly numerate and literate with great communication skills used in meetings, site visits and public engagement. I regularly undertake specialised marine scientific data collection, research, analysis, reporting as well as presentations, administration and meetings.

I set up Enviromud in November 2019 and now run a successful business providing expert measurement and consultancy in cohesive (muddy) sediments.

KEY SKILLS

Communication: Outgoing and confident. Author of scientific papers and presentations and numerous technical reports. am co-author of a leading technical book 'Dynamics of Estuarine Muds'. Liaison with customers, stakeholders and researchers. Proficient in WORD and Excel. Cub Leader and Dorset Wildlife Trust Volunteer Marine Warden.

Research: Literature research, fieldwork and laboratory including methodology development, data collection and analysis. I have carried out numerous research projects in the field of cohesive sediment transport and

Organisation: Survey organisation, planning and management of diverse teams. Undertake complex logistics (people, meetings, travel, equipment, transportation and environmental factors) to achieve successful surveys and data collection, and analysis. Health and Safety trained and regularly write RAMS.

Innovation: Developed instrumentation, techniques and methodologies. Creation of new business areas and ideas. Key achievement is the development and use of SedErode – a Field Instrument for Measuring Cohesive Sediment Erodibility In-Situ. I have my own sediment laboratory and regularly analyse a range of sediments, maintain and develop instrumentation.

Consultancy: Evaluation and advice including sediment impact assessments, environmental impact assessments, ecological risk assessments, flood risk assessments, contaminated land risk assessments and development of mitigation advice. Expert in cohesive sedimentological measurement, assessment and sediment dynamics. I run my own sedimentological measurement and consultancy business, Enviromud.

Practical: Very hands-on approach in the natural environment conducting multidisciplinary sedimentological surveys on mudflats, boats, pontoons, banks and fields, even in challenging environments, with a can-do attitude. Laboratory skills for a wide range of sediment analysis.

CAREER HISTORY AND ACHIEVEMENTS

Nov 2019 - present ENVIROMUD, Expert Muddy Sediment Measurement and Consultancy

I have set up a unique measurement and consultancy business, ENVIROMUD, to provide expert assessment and evaluation of properties and sediment dynamics of cohesive and mixed sediments.

Since December 2021, ENVIROMUD is providing expert measurement and consultancy services in support of an ongoing airport construction project in Manila, Philippines for San Miguel Aerocity Inc.. My role is sedimentological consultant within an expert multidisciplinary team and includes benthic sediment surveys, on-site training, supervision of survey logistics, methods, instrumentation and techniques, consultancy, data analysis, interpretation and reporting. The project is to investigate necessary habitat conditions and provide mitigating offset mudflat habitat regions for critical bird species. Provision of expert consultancy is ongoing and providing insight into understanding of natural successful intertidal mudflat for critical bird feeding grounds and also providing recommendations for design and location of potential mudflat-creation offset sites. The project is a complex one,

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and ENVIROMUD is part of a global team of biodiversity, sedimentology, marine biology, bird ecology and habitat creation experts combining to make the mudflat habitat recreation for birds project a success.

I organised and executed a seawall delph ditch sediment survey in November 2024 for Kier Ltd to investigate the characteristics of the ditch sediment including, particle size analysis and density profiles using bespoke in-house instrumentation. The results provided a unique insight into the ditch sediments and were used to evaluate methods for ditch infill as part of the Arne Moors Coastal Change Project.

In September 2023, I managed a team and conducted a sediment sampling survey in the outer Wareham Estuary for the Environment Agency, carried out detailed specialist comprehensive laboratory determinations of particle size distribution, density, sediment characteristics and minerology. The data was used to assess the local sediment transport regime in support of the Arne Moors Coastal Change Project for the Environment Agency. I continue to be the preferred contractor to measure sediments for this project and work is ongoing.

I have conducted sediment sampling and specialist turbidity sensor calibrations for Aquatec Ltd (March 2023 and January 2024) in support of fine sediment removal remediation works in sensitive aquatic environments to assess sediment release into downstream watercourses. This work has involved sensor deployment advice, sampling and specialist laboratory calibrations (optical turbidity to 'real' total suspended solids concentration) and interpretation of results to allow assessments of sediment concentration records against natural local sediment fluxes.

Enviromud achieved seven successful sediment transport surveys between November 2020 and November 2022 in the Parrett Estuary UK for the Environment Agency, in support of the Bridgwater Tidal Barrage Scheme. These comprised four High Equinox Springs HW-HW through tide water-based surveys measuring water column profiles of turbidity (with water sampling for suspended sediment concentration for calibration), salinity, temperature, velocity, plus bottom grab samples (two boat surveys and two temporary pontoon surveys). Three detailed bank surveys have been undertaken to measure erodibility and sediment properties of the bank intertidal sediments. This work has been undertaken in a very challenging and dynamic estuary, with high flows, a tidal bore, and steep intertidal banks. To achieve this, I developed detailed logistics and managed specialist safety access teams and liaised with numerous local stakeholders, including engineering contractors, Harbour Masters, local council and others and undertook specialist and comprehensive sedimentological and hydrodynamic measurements. I achieved a very comprehensive data set, previously unmeasured in this challenging estuary. Detailed analysis of the results produced a preliminary conceptual model of the local sediment transport regime for modelling and adaptive management.

Between January 2020 and January 2023, I conducted long term monitoring project in the Medina Estuary, Cowes, UK for Cowes Harbour Commission to evaluate sediment flux patterns to aid dredging decisions. This included turbidity sensor maintenance, calibrations, data analyses and sediment transport assessment.

May 2009 – November 2019

Whilst raising a young family I have been employed in various part-time and temporary positions including: Independent Scientific Consultant, Shellfish Hygiene Temporary Scientist at CEFAS, Nuclear Waste Consultant (Inutec Ltd), Hydrophone Calibration Scientist (Precision Acoustics), Technical Writer (Honeywell), Waste Water Management Consultant (Wat-er-Save), studied FDS Sc Marine Ecology and Conservation at Kingston Maurward College, Seasonal Ecological Surveyor plus a self-employed gardening business. Also a Marine Warden for Dorset Wildlife Trust

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April 2004 - May 2009 Specialist Water Scientist; Such Salinger Peters Ltd, Winfrith, Dorset

I was a scientific expert within a small consulting engineering firm dealing with drainage and design. I provided environmental impact and contamination assessments for design projects. My work regularly included analysis of data, reporting and liaison with customers and stakeholders. I developed a new business area in ecological assessment and mitigation. I also headed and ran a new business sector, AQUAMUD, providing consultancy in muddy sediment transport and environmental impacts. My work also included waste water and SuDS evaluations, sediment transport studies and site investigations. I conducted two investigative studies on Soil Erodibility and Conceptual Model Scoping for the Environment Agency Catchment Sensitive Farming Initiative, and also an investigation into fine sediments in the River Win for UKAEA.

Nov 1999 - April 2004 Marine Scientist; QinetiQ, Winfrith, Dorset

I carried out MOD and commercial research in coastal oceanography including data searches, environmental impact assessments, field data collection, data analysis and technical reporting. I was a Laboratory Manager with health and safety responsibilities including risk assessments, COSHH records and VDU assessments. variety of projects including investigative oceanographic measurements on beaches for MOD applications, nanochemistry, development of a sonochemical reactor for water purification, fibre optics and evaluation of sensors. My work also included business support including market research, proposal writing and business development.

June 1990 – April 1999 Marine Research Scientist; H R Wallingford Ltd, Wallingford, Oxon

I carried out high level commercial and academic research into muddy marine sediments. This involved planning, supervising and executing field data collection campaigns to research muddy sediment erosion, consolidation, engineering properties and morphology. I developed and used a new and novel field instrument (SedErode) and deployed it on muddy substrates in the field including estuaries, ports and shelf seas. I carried out laboratory based sedimentological investigations. My work involved writing a wide range of technical reports and scientific papers and delivering scientific presentations in UK and internationally. In addition I was co-author of a book 'Dynamics of Estuarine Muds – A Manual for Practical Applications'. I also provided business support including writing proposals and project management.

Oct 1988 - June1990 Oceanographer; Sir William Halcrow and Partners Ltd (now Jacobs) Swindon

I provided oceanographic expertise into a wide variety of engineering consultancy projects including water quality assessments and numerical modelling. I was also a site engineer on dredging and reclamation project including witnessing, hydrographic measurements, progress assessment and reporting.

EDUCATION AND PROFESSIONAL STATUS

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| 2017 | Kingston Maurward College/ Bournemouth University BSc Marine Ecology and Conservation (3 units - Marine Ecology, Marine Environmental Science, Conservation – with distinctions). Also statistics SPSS package and analysis. |
| 2006 | Chartered Marine Scientist, MIMarEST (Member of the Institute of Marine Engineering, Science and Technology) |
| 1988 | University of Southampton: M.Sc.Oceanography |
| 1987 | University of Southampton: B.Sc. Hons. Chemistry with Oceanography |

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1984 **A-Levels:** Nuffield **Chemistry** (grade A), S.M.P. **Mathematics** (grade B), **Biology** (grade B)
1995 **A-level:** **Physics** (grade B, Evening Class)

1982 **O-levels:** English Literature, English Language, French, History, Geography, Physics with
Chemistry, Biology, Additional Mathematics
1981 **O-level:** S.M.P. Mathematics

RELEVANT COURSES AND CPD

Report Writing, Presentation Skills, Technical Report Writing , Health and Safety Trained - Risk Assessment, Display Screen Assessors, Manual Handling, Hazards at Work, Intellectual Property Rights. Cetacean and Seabird Identification, Sea Shore Surveys. Numerous technical and business training courses.

INTERESTS

Enjoy most sports, outdoor life, walking, camping, exploring, was a Dorset Wildlife Trust Marine Warden (and hope to take this up again in future) , Assistant Cub Leader. BSAC Diver, former County Hockey player, Regional Ladies Rugby player. Historical Cookery, Gardening.

REFERENCES

Dr Rob Nunny, SedimentIntelligence,
1 Hexton Road, Glastonbury, Somerset BA6 8HL
07977 129028
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Jim Peters, Managing Director, Such Salinger Peters Consultancy Ltd, Dean Park Court, 8-10 Dean Park Crescent,
Bournemouth, Dorset BH1 1HL
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SELECTED PAPERS AND REPORTS

Please note that I have published numerous papers and reports under MITCHENER (maiden name to 1989 and again 1996 to 1999), WILLIAMSON (1989 -1996) and LOWE (from October 1999)

Text Book:

R J S Whitehouse, R L Soulsby, W Roberts H J Mitchener - 'Dynamics of Estuarine Muds - A Manual for Practical Applications'. HR Wallingford Ltd. and Thomas Telford, 2000, London, UK. ISBN 0-7277-2864-4.

Key Papers and Reports:

Lowe, H.J and Black, K (2008). Catchment Sensitive Farming Initiative: Integrating Soil Erosion Resistance Measurements into Conceptual Soil Loss Models for Catchment Management Purposes: A Scoping Study. Report for the Environment Agency, April, AQUAMUD (Such Salinger Peters Ltd) Report 8003, April 2008.

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Lowe, H.J, K (2008). River Win Tributary Erosion Measurements and Channel Survey. Report for UKAEA, April, AQUAMUD (Such Salinger Peters) Report 8001, April 2008.

Lowe, H.J and Black, K (2007). Catchment Sensitive Farming Initiative: Soil Erosion Measurements and Characteristics in the Brue and Tone Catchments. Report for the Environment Agency, May 2007, AQUAMUD (Such Salinger Peters Ltd) Report 8000, May 2007.

Mitchener H.J., Gallaher A., 'Development of a novel approach of a sonochemical reactor for the breakdown of contaminants in water', QinetiQ technical report, March 2003.

Mitchener H.J, Scott J., "Regional Oceanography of Freshwater Influence – for Commercial and Naval Applications". QinetiQ report.

Mitchener H. J. and O'Brien D J. "Seasonal Erodibility and Properties of Mudflat Sediments in a Macrotidal Estuary, Peterstone Wentlooge, Cardiff, UK."(2001).

Whitehouse, R.J.S., Bassoullet, P., Dyer, K.R., Mitchener, H.J., Roberts, W. (2000) "The influence of bedforms on flow and sediment transport over mudflats." Continental Shelf Research 20 (2000) pp 1099-1124.

Christie, M.C., Dyer, K.R., Blanchard, G., Cramp, A., Mitchener, H.J., Paterson, D.M. (2000) "Temporal and spatial distribution of moisture and organic contents across a macro-tidal mudflat." Continental Shelf Research 20 (2000) pp 1219-1241.

Tolhurst, T.J., Black, K.S., Paterson, D.M., Mitchener, H.J., Termat, R., Shayler, S.A. (2000) "A comparison and measurement standardisation of four in situ devices for determining the erosion shear stress of intertidal sediments." Continental Shelf Research 20 (2000).

Mitchener H.J, Whitehouse R.J.S, Soulsby R.L. and Lawford V.A. (1996). Estuarine Morphodynamics. Development of SedErode – Instrument for In-Situ Mud Erosion Measurements. HR Wallingford Report TR 17, October 1996.

Mitchener H.J. (1996). SedErode – Manual for Operation, Calibration and Data Analysis', HR Wallingford Report TR13, May 1996.

Damgaard J.S. and Mitchener H.J. (1997). River Bank Recession: Experiments on Non-Cohesive and Cohesive Banks. Paper being presented at the 3rd International Conference on River Flood Hydraulics, Stellenbosch, South Africa, 5-7 November, 1997.

Whitehouse R.J.S. and Mitchener H.J (1997). Observations of the Morphodynamic Behaviour of an Intertidal Mudflat at Different Timescales. Sedimentary Processes in the Intertidal Zone. Presented at a joint meeting of the Challenger Society for Marine Science and LISP, held at The Geological Society, Burlington House, London, 27-28 February 1997.

Mitchener H.J., Torfs H. and Whitehouse R.J.S. (1996). Erosion of Mud/Sand Mixtures. Journal of Coastal Engineering, Vol. 29, pp1-25.

Torfs H., Mitchener H.J., Huysentruyt H. and Toorman E. (1996). Settling and Consolidation of Mud/Sand Mixtures. Journal of Coastal Engineering, Vol. 29, pp27-45.

Williamson, H.J. and Ockenden M.C. (1996). ISIS: An Instrument for Measuring Erosion Shear Stress In-Situ. Journal of Estuarine, Coastal and Shelf Science, Vol. 42, pp1-18.

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Torfs H., Williamson H.J., Huysentruyt H., (1995). Settling and Erosion Characteristics of Mud/Sand Mixtures. Coastal Dynamics '95. International Conference on Coastal Research in terms of Large Scale Experiments. September 4-8,1995, Gdansk, Poland.

Williamson, H.J. and Ockenden, M.C. (1993). Laboratory and field investigations of mud and sand mixtures. Advances in Hydro-Science and Engineering, Vol. 1, Sam S.Y. Wang (ed.), pp.622-629.

Williamson H.J. (1992). Estuarine Sediments - Near Bed Processes. New Modelling Techniques for Cohesive Sediments. HR Wallingford Report SR 299, March 1992.

Williamson H.J. (1991). Tidal Transport of Mud/Sand Mixtures - Sediment Distributions -A Literature Review. HR Wallingford, Report SR 372.

Burdall A.C. and Williamson H.J. (1990). A Green Port - An Engineer's View. Paper in 'Ports into the Next Century', ed. C.R. Ford, Thomas Telford. Proc. of the ICE Conference on 'Ports 2000', Hull, October 1990. Produced at Sir William Halcrow and Sons Ltd.

Williamson H.J. (1990). Some Data Sources for Marine Environmental Modelling. Proceedings of Oceanology '90, Civil Applications Volume 2. Brighton, March 1990. Produced at Sir William Halcrow and Sons Ltd.