Mahdi Razaz

Research Associate
Department of Marine Sciences
University of Georgia
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Educational Training

2007-2010 ***PhD in Civil and Environmental Engineering***
Hiroshima University, Higashi-Hiroshima, Hiroshima Prefecture, Japan
Thesis: Turbulence structures and transport processes of suspended sediment in the Ota Diversion Channel

2003-2006 ***MSc in Civil Engineering (Hydraulic Structures)***
Ferdowsi University, Mashhad, Khorasan, Iran
Thesis: Numerical and experimental investigations of bottom racks

1998-2003 ***BSc in Civil Engineering***
Ferdowsi University, Mashhad, Khorasan, Iran

Professional Preparation

2016- ***Postdoctoral Research Associate***
Department of Marine Sciences, University of Georgia, Athens, GA, USA
Project: Vertical upwelling and bottom-boundary layer dispersal at a natural seep site in the Gulf of Mexico

2014-2016 ***Postdoctoral Research Associate***
Department of Physical Oceanography, Memorial University, St. John's, NF, Canada
Project: Developing SwathDopp, a multibeam pulse-coherent doppler sonar for scanning 2D velocity sections near the sediment-water interface

2010-2014 ***Japan Society for the Promotion of Science (JSPS) Fellow***
Graduate School of Engineering, Hiroshima University, Higashi-Hiroshima, Hiroshima, Japan
Project: Developing Fluvial Acoustic Tomography system for long-term monitoring of mass and heat flux in rivers and estuaries

Research Interests

My research crosses the boundaries of engineering and physics. I develop and employ in-situ acoustic (based on time-of-travel, Doppler shift, and scintillation drift theories) and optical sensors in a wide range of aquatic environments to

- Monitor volume, heat, and mass (contaminants and sediments) transport in rivers and estuaries
- Examine fine-scale turbulent processes in stratified flows and near water-sediment interface
- Perform integrated modeling and observation of behavior of natural hydrocarbon seeps over long terms
- Oil spill response engineering
- Renewable energy (in-stream tidal energy, hydroelectric power generation)

Research Grants / Scholarships

Pending

2021-2024 Collaborative research: Temporal variability of the source dynamics of a natural hydrocarbon seep and its connection to the ocean surface
Co-PI, National Science Foundation (1`200`000 USD) – Submitted Aug 2020

2020-2023 Quantifying source characteristics in seep environments from natural high flux vents
Co-PI, NOAA (~750`000 USD) – Will be submitted Oct 2020
In prep

Funded
Total grants + scholarships earned: 184`000 USD

2013-2014 Developing a real-time monitoring system for measuring salt and mass fluxes in an estuary using the acoustic tomography technique
PI, River Maintenance Fund, Foundation of River & Watershed Environment Management (10`000 USD)

2012-2014 Application of an array of Fluvial Acoustic Tomography system to reconstruct depth-averaged vorticity and transport components of flow in a shallow river
PI, Japan Society for Promotion of the Science (JSPS) Fellowship (90`000 USD)

2012 Collaborative research: Measuring intermittent tidal currents in Shippagan using Fluvial Acoustic Tomography system
PI, Japan Society for Promotion of the Science (JSPS), Grant-in-Aid for Scientific Research (Tokubetsu Kenkyuin Shoreihi), (15`000 USD)

2011-2012 Developing a multi-node Fluvial Acoustic Tomography system to visualize horizontal flow distribution
PI, Japan Society for Promotion of the Science (JSPS), Grant-in-Aid for Young Scientists (Kakenhi-B), (50`000 USD)

2012 PI, Young Researcher Overseas Dispatch (over 1 month), JSPS, 2012 (7`500 USD)

2010-2012 PI, Young Researcher Overseas Dispatch (1 month), JSPS (3`000×3 USD)

2007-2010 Turbulence structures and transport processes of suspended sediment in the Ota Diversion Channel
PhD Candidate, Monbukagakusho, Ministry of Education, Culture, Sports, Science and Technology of Japan (60`000 USD)

2005-2006 Adapting the design guidelines of bottom rack intakes to semi-arid environments based on laboratory experiments
PI, Grant for MSc Thesis, Khorasan Water and Wastewater Company (25`000 USD)

Publications

Refereed Journal Papers

Razaz, M., D. Di Iorio, Observed turbulent flux induced by a hydrocarbon seeps and comparison with the background dynamics (in prep ***Journal of Geophysical Research: Oceans***)

2020 **Razaz, M.**, D. Di Iorio, B. Wang, S. Daneshgar Asl, A.N. Thurnhurr, J. Kelly, Variability of a natural hydrocarbon seep and its connection to the ocean surface, ***Nature Scientific Reports***, 10, 12654, doi.org/10.1038/s41598-020-68807-4.

2020 **Razaz, M.**, D. Di Iorio, B. Wang, I. McDonald, Temporal variations of a natural hydrocarbon seep using a deep-sea camera system, ***Journal of Atmospheric and Oceanic Technology***, 1(41), doi.org/10.1175/JTECH-D-19-0137.1.

2020 **Razaz, M.**, L. Zedel, A. Hay, K. Kawanisi, Monitoring tidal currents in a well-mixed, narrow strait using a mid-frequency time-of-travel instrument (in press ***Journal of Geophysical Research: Oceans***).

2019 **Razaz, M.**, L. Zedel, A. Hay, SwathDop: multibeam pulse-coherent Doppler sonar for scanning 2D velocity sections near the sediment-water interface, ***Journal of Atmospheric and Oceanic Technology***, 36(11), 2153-2169, doi:10.1175/JTECH-D-19-0021.1.

2015 Kawanisi, K., M. BahrainiMotlagh, M. AlSawaf, and **M. Razaz**, High-frequency streamflow acquisition and bed level/flow angle estimates in a mountainous river using shallow-water acoustic tomography, ***Hydrological Processes***, 30(13), 2247–2254, doi: 10.1002/hyp.10796.

2015 **Razaz, M.**, K. Kawanisi, A. Kaneko, and I. Nistor, Application of Acoustic Tomography to Reconstruct Horizontal Flow Velocity Field in a Shallow River, ***Water Resource Research,*** 51(12), 9665-9678, doi: 10.1002/2015WR017102.

2014 **Razaz, M.**, K. Kawanisi, and I. Nistor, Tide-driven controls on maximum near-bed floc size in a tidal estuary, ***Journal of Hydro-environment Research***, 9(3), 465-471, doi: 10.1016/j.jher.2014.04.001.

2013 **Razaz, M.**, K. Kawanisi, I. Nistor, and S. Sharifi, An acoustic travel time method for continuous velocity monitoring in shallow tidal streams, ***Water Resources Research***, 49(8), 4885-4899, doi: 10.1002/wrcr.20375, 2013.

2013 Kawanisi, K., **M. Razaz**, J. Yano, and K. Ishikawa, Continuous monitoring of a dam flush in a shallow river using two crossing ultrasonic transmission lines, ***Measurement Science and Technology***, 24(5), 055303, doi: 10.1088/0957-0233/24/5/055303.

2012 **Razaz, M.**, and K. Kawanisi, Turbulence characteristics in the bottom layer of a shallow tidal channel, ***Journal of Turbulence***, 13, N52, doi: 10.1080/14685248.2012.741322.

2012 Kawanisi, K., **M. Razaz**, K. Ishikawa, J. Yano, and M. Soltaniasl, Continuous measurements of flow rate in a shallow gravel-bed river by a new acoustic system, ***Water Resource Research***, 48, doi: 10.1029/2012WR012064.

2012 Soltaniasl, M., K. Kawanisi, and **M. Razaz**, Investigation of salinity variability in a small multi-channel estuary, *Journal of Japan Society of Civil Engineers, Ser.B1 (Hydraulic Engineering)*, 68(4), I_265-I_270.

2012 **Razaz, M.**, and K. Kawanisi, Measurements of influence of salinity and turbulent motion on floc characteristics in a tidal estuary, *Journal of Japan Society of Civil Engineers, Ser.B1 (Hydraulic Engineering)*, Vol. 68 (4), I_7-I_12.

2012 Ishikawa, K., K. Kawanisi, **M. Razaz**, J. Yano, and M. Soltaniasl, Continuous monitoring of streamflow and cross-sectional average temperature in a shallow gravel-bed river by fluvial acoustic tomography, *Journal of Japan Society of Civil Engineers, Ser.B1 (Hydraulic Engineering)*, 68(4), I_1333-I_1338 (In Japanese).

2011 **Razaz, M.**, and K. Kawanisi, Signal post-processing for acoustic velocimeters: Detecting and replacing spikes, ***Measurement Science and Technology***, 22, 125404, doi: 10.1088/0957-0233/22/12/125404.

2011 **Razaz, M.**, and K. Kawanisi, Despiking high-resolution ADCP data, *Journal of Japan Society of Civil Engineers, Ser.B1 (Hydraulic Engineering*), 6(4), I_217-I_222.

2010 Kawanisi, K., **M. Razaz**, A. Kaneko, and S. Watanabe, Long-term measurements of stream flow and salinity in a tidal river by the use of the fluvial acoustic tomography system, ***Journal of Hydrology***, 380(1-2), 74-81, doi: 10.1016/j.jhydrol.2009.10.024.

2010 Kawanisi, K., **M. Razaz**, G. S. De Costa, and C. De Costa, Continuous monitoring of water discharge, temperature, and salinity in a tidal spillway using fluvial acoustic tomography system, *Journal of Hydrology :New Zealand*, 49(2), 61-68.

2010 Kawanisi, K., **M. Razaz**, S. Watanabe, A. Kaneko, and T. Abe, Continuous measurement of flood flow and crosssectional average salinity in the Ota Diversion Channel with fluvial acoustic tomography, *Journal of Japan Society of Civil Engineers, Ser.B1 (Hydraulic Engineering)*, 54, 1081-1086, (In Japanese).

2010 **Razaz, M.**, and K. Kawanisi, Observation of turbulence characteristics in the Ohta River using ADV and HRCP, *Journal of Japan Society of Civil Engineers, Ser.B1 (Hydraulic Engineering)*, 54, 211-216.

2009 **Razaz, M.**, K. Kawanisi, and T. Yokoyama, Turbulent flow in bottom layer of the Ohta River, *Journal of Japan Society of Civil Engineers, Ser.B1 (Hydraulic Engineering)*, 53, 193-198.

2009 Kawanisi, K., T. Yokoyama, **M. Razaz**, and S. Fukuoka, The flow and sediment transport in a tidal flat, *Annual Journal of Hydraulic Engineering-JSCE*, 53, 1441-1446, (In Japanese).

2009 Kawanisi, K., T. Yokoyama, **M. Razaz**, T. Abe, and S. Fukuoka, The flow and sediment transport in a tidal flat of a tidal channel, *Annual Journal of Hydraulic Engineering-JSCE*, 53, 1441-1446, (In Japanese).

2009 Kawanisi, K., **M. Razaz**, S. Watanabe, A. Kaneko, and T. Abe, Continuous monitoring of discharge, water temperature, and salinity in an estuary with a next-generation acoustic velocimeter, *Annual Journal of Hydraulic Engineering-JSCE*, 53, 1015-1020, (In Japanese).

2008 **Razaz, M.**, and M. F. Maghrebi, Experimental investigations on hydraulic parameters of bottom rack intakes, *Journal of Faculty of Engineering (University of Tabriz)*, 52, 23-35, (In Persian).

2008 Kawanisi, K., T. Yokoyama, **M. Razaz**, S. Fukuoka, and T. Abe, Observation of effect of wind on sediment transport in Otagawa Estuary, *Annual Journal of Coastal Engineering (Japan Society of Civil Engineers)*, 55, 386-390, (In Japanese).

2008 Kawanisi, K., **M. Razaz**, A. Kaneko, and T. Abe, Measurement of freshwater discharge in an estuary by acoustic tomography, *Annual Journal of Coastal Engineering (Japan Society of Civil Engineers)*, 55, 1466-1470, (In Japanese).

2008 Kawanisi, K., **M. Razaz**, A. Kaneko, and T. Abe, Transport characteristics of salt water and spm in the ohtagawa diversion channel, *Annual Journal of Hydraulic Engineering (Japan Society of Civil Engineers)*, 52, 1321-1326, (In Japanese).

2008 Kawanisi, K., T. Kurumida, **M. Razaz**, M. Mizuno, and S. Fukuoka, Measurement of freshwater discharge in an estuary by acoustic tomography, *Annual Journal of Hydraulic Engineering (Japan Society of Civil Engineers)*, *52*, 1321-1326, (In Japanese).

Invited Oral Presentations and Workshops

2019 **Razaz, M.**, L. Zedel, A.E. Hay, Multi-beam Doppler sonar for measuring 2-D velocities in a swath: SwathDop, The 5th Underwater Acoustics Conference & Exhibition (UACE2019), Heraklion, Crete, Greece.

2018 **Razaz, M.**, Webinar on "Shallow water acoustic tomography: numerical simulations and field applications", Invited by Acoustic Engineering Society of Iran.

2013 **Razaz, M.**, K. Kawanisi, I. Nistor, and C. D. Rennie, Continuous velocity measurement with travel-time method in stratified shallow flows, Proc. of the 1st International Conference and Exhibition on Underwater Acoustics (UAC/UAM), 555-561, Corfu, Greece.

2013 Kawanisi, K., K. Ishikawa, **M. Razaz**, and J. Yano, An application of a shallow acoustic tomography: Continuous monitoring of streamflow and water temperature in a mountain river, Proc. of the 1st International Conference and Exhibition on Underwater Acoustics (UAC 2013), 539-546, Corfu, Greece.

2013 Edinburgh-Pacific Partnership of Excellence in New Energy Technologies (EPENET) Showcases & Workshops, Kyoto University.

2011 Kawanisi, K., **M. Razaz**, M. Soltaniasl, and A. Kaneko, Long-term salinity measurement in a tidal estuary by the use of acoustic tomography, Proc. of Underwater Acoustic Measurements: Technologies and Results (UAM 2011), 401-408, Kos, Greece.

Oral Presentations in National and International Conferences

2020 **Razaz, M.**, D. Di Iorio, B. Wang, and S. Daneshgar Asl, A Multimethod Approach to Study the Variability of a Natural Hydrocarbon Seep and its connection to the surface, Ocean Sciences Metting AGU, San Diego, CA, USA.

2020 **Razaz, M.**, D. Di Iorio, B. Wang, and S. Daneshgar Asl, Transfer of hydrocarbons from a natural seep to the water column and its footprint on the sea surface, Gulf of Mexico Oil Spill and Ecosystem Science Conference, Tampa, FL, USA.

2019 **Razaz, M.**, D. Di Iorio, A.N. Thurnhurr, B. Wang, S. Daneshgar Asl, and A. Dissanayake, Temporal Variability of Vertical Upwelling of a Natural Hydrocarbon Seep and its Connection to the Ocean Surface, Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA, USA.

2018 **Razaz, M.**, L. Zedel, A.E. Hay Design and testing of a swath Doppler sonar system to provide 2-component velocity measurements for sediment transport studies, 52th Canadian Meteorological and Oceanographic Society's (CMOS) Congress, Halifax, NS, Canada.

2018 **Razaz, M.**, D. Di Iorio, J. Kelly, Monitoring acoustic signature of deep-sea hydrocarbon seeps in the Gulf of Mexico, Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA, USA.

2017 **Razaz, M.**, D. Di Iorio, J. Kelly, Acoustic investigations of natural seeps at GC600, 174th Meeting of the Acoustical Society of America, New Orleans, LA, USA, The Journal of the Acoustical Society of America 142(4):2506.

2017 Di Iorio, D., **Razaz, M.**, J. Kelly, An inventory of natural seeps using archived acoustic backscatter data, Gulf of Mexico Oil Spill & Ecosystem Science Conference, New Orleans, LA, USA.

2016 **Razaz, M.**, L. Zedel, A.E. Hay, Multipath propagation of sound in a shallow tidal channel and its implications on tomographic current measurements, 5th Joint Meeting of the Acoustical Society of America and Acoustical Society of Japan, Honolulu, HI, USA. The Journal of the Acoustical Society of America 140(4):3184-3184.

2016 **Razaz, M.**, L. Zedel, A.E. Hay, Preliminary results of applying a shallow acoustic tomography system to monitor tidal currents in Grand Passage, Nova Scotia, 50th Canadian Meteorological and Oceanographic Society's (CMOS) Congress & joint CGU Annual Meeting, Federicton, NB, Canada.

2016 **Razaz, M.**, L. Zedel, K. Kawanisi, and I. Nistor, Depth-averaged flow reconstruction in an extremely shallow estuary, 6th International Conference on the Application of Physical Modelling in Coastal and Port Engineering and Science CoastLab16, Ottawa, ON, Canada.

2015 **Razaz, M.**, L. Zedel, A.E. Hay, and R. Cheel, A swath Doppler system for measuring bedload movement, Seabed and Sediment Acoustics: Measurements And Modelling Proc. of the Institute of Acoustics, P51, Bath, UK.

2015 **Razaz, M.**, K. Kawanisi, A.E. Hay, L. Zedel, and N. Goda, Application of acoustic tomography in shallow waters, The IEEE/OES Eleventh Current, Waves and Turbulence Measurement Workshop (CWTM 2015), 141024-019, St. Petersburg, FL, USA.

2014 Sharifi, S., **M. Razaz**, A new methodology for deriving regional time of concentration equations using GIS and genetic programming, 11th International Conference on Hydroinformatics (HIC 2014), Paper 1556, New York, USA.

2014 Sharifi, S., **M. Razaz**, Probabilistic calibration of a quasi 2D hydrodynamic model, 3rd IARH Europe Congress, Porto, Portugal.

2012 **Razaz, M.**, J. Yano, K. Ishikawa, and K. Kawanisi, Application of acoustic tomography for gaging discharge of a tidally dominated river, Proc. of the 10th International Conference on Hydroscience & Engineering (ICHE 2012), 40026488-40026491, Florida, US.

2012 **Razaz, M.**, and K. Kawanisi, Measurements of influence of salinity and turbulent motion on floc characteristics in a tidal estuary, Proc. of 8th Congress of the Asia and Pacific Division of the International Association of Hydro-Environment Engineering and Research (IAHR-APD 2012), S6D-2, Jeju, Korea.

2012 **Razaz, M.**, and K. Kawanisi, Turbulence structure in bottom layer of a tidal estuary, Proc. of 5th International Conference on Fluvial Hydraulics (River Flow 2010), 99-104, Braunschweig, Germany.

2012 Yano, J., K. Kawanisi, **M. Razaz**, K. Ishikawa, and M. Miyamoto, Measuring streamflow and salinity in a tidal estuary with saltwater intrusions, Proc. of the 4th International Conference on Estuaries and Coasts, 217-222, Hanoi, Vietnam.

2012 Soltaniasl, M., K. Kawanisi, and **M. Razaz**, Salinity transport mechanisms in a small multi-channel estuary, Proc. of the 8th Congress of the Asia and Pacific Division of the International Association of Hydro-Environment Engineering and Research (IAHR-APD 2012), S7E-2, Jeju, Korea.

2012 Soltaniasl, M., K. Kawanisi, M. F. Maghrebi, and **M. Razaz**, Salt intrusion and water circulation in a small multi-channel estuary, Proc. of the 10th International Conference on Hydroscience & Engineering (ICHE 2012), 40082313-40082326, Florida, US.

2012 Kawanisi, K., K. Ishikawa, **M. Razaz**, and J. Yano, Investigation of streamflow fluctuations by fluvial acoustic tomography, Proc. of 4th International Conference on Estuaries and Coasts, 209-216, Hanoi, Vietnam.

2012 Ishikawa, K., K. Kawanisi, **M. Razaz**, and J. Yano, Investigation of river discharge fluctuations in a shallow gravel-bed river, Proc. of 8th Congress of the Asia and Pacific Division of the International Association of Hydro-Environment Engineering and Research (IAHR-APD 2012), S3B-2, Jeju, Korea.

2012 Ikeda, M., K. Kawanisi, **M. Razaz**, K. Ishikawa, and M. Miyamoto, Investigation of streamflow fluctuations by fluvial acoustic tomography, Proc. of 4th International Conference on Estuaries and Coasts, 325-331, Hanoi, Vietnam.

2010 **Razaz, M.**, K. Kawanisi, and M. F. Maghrebi, Observation of suspended sediment and turbulence characteristics in a tidal estuary, Proc. of the 17th Congress of the Asia and Pacific Division of the International Association of Hydro-Environment Engineering and Research (IAHR-APD 2010), 4a011, Auckland, New Zealand.

2010 **Razaz, M.**, and K. Kawanisi, Preliminary findings of spm size in the Ota floodway, Proc. of the 9th International Conference on Civil and Environmental Engineering (ICCEE2010), 318, Dalian, China.

2010 Kawanisi, K., **M. Razaz**, and S. Watanabe, An innovative methodology/technology for streamflow observation, Proc. of the 5th International Conference on Fluvial Hydraulics (River Flow 2010), 1741-1748, Braunschweig, Germany.

2009 **Razaz, M.**, and K. Kawanisi, Turbulent structure in bottom layer of a tidal estuary, Proc. of the 33rd IAHR Congress: Water Engineering for a Sustainable Environment, 1921-1930, Vancouver, Canada.

2009 **Razaz, M.**, and K. Kawanisi, Long-term observations of flow and suspended sediment in a tidally-dominated estuary, Proc. of Coastal Dynamics 2009, 139, Tokyo, Japan.

2009 Kawanisi, K., **M. Razaz**, and A. Kaneko, Continuous measurement of water discharge, temperature, and salinity in a tidal spillway using a fluvial acoustic tomography system, Proc. of 33rd IAHR Congress: Water Engineering for a Sustainable Environment, 378, Vancouver, Canada.

2008 Kawanisi, K., A. Kaneko, **M. Razaz**, and T. Abe, Measurement of cross-sectional average velocity in a shallow tidal river with a next-generation acoustic velocity meter, Proc. of 3rd Symposium of IAHR-ISHS, 1973-1977, Nanjing, China.

2007 **Razaz, M.**, M. F. Maghrebi, and K. Kawanisi, Experimental investigations on bottom racks discharge diversion, Proc. of International Conference on Civil and Environmental Engineering 2007, 07P09, Higashi Hiroshima, Japan.

Teaching Experience

Developed Course

2014-2016 Estuarine and Coastal Measurements, CVG6309, 3 credits 21 hours (100%), 20-31 MSc/PhD students
Department of Civil Engineering, University of Ottawa

Taught Graduate Courses

2018 Advanced Fluid Mechanics (50%), CVLE8160, 3 credits 10 hours (50% co-taught with Dr. Brock Woodson), 22 MSc/PhD students
College of Engineering, University of Georgia

2017 CVLE4140 Mixing and Transport in River, 3 credits 10 hours (50% co-taught with Dr. Brock Woodson), 9 MSc/PhD students
College of Engineering, University of Georgia

Short Courses Developed

2008-2014 Training course on Field Instrumentation, 15 hours (100%), 5-13 BSc/MSc students
Department of Civil and Environmental Engineering, Hiroshima University

2008-2014 Programming with Mathematica, 3 credits 21 hours (100%), 11-19 BSc/MSc students
Department of Civil and Environmental Engineering, Hiroshima University

2007 Lab Safety Training Course for Graduate Students 1.5 hours (100%), 5-10 BSc/MSc students
Department of Civil and Environmental Engineering, Hiroshima University

Courses Prepared to Teach
- Introduction to Oceanography
- River Hydrology and Hydraulics
- Basics of Sediment Transport in Rivers and Estuaries
- Fluid Mechanics; Advanced Fluid Mechanics
- Observational Methods and Data Analysis in Rivers and Estuaries
- Mixing and Transport in Rivers and Coastal Areas
- Buoyant Plume and Jet Mechanics
- Introduction to Statistics and Analytical Techniques with Mathematica

Professional Development in Teaching

2014 Attended: Teaching Skills Enhancement Program (TSEP) course, Memorial University

2018, 2019 Attended: Teaching Symposium, University of Georgia

Students Co-Supervised (Research Projects)

Graduate

2012-2014 Kazuhiko Ishikawa, Hiroshima University
Long-term measurement of discahrge in a mountaneous river

2012-2014 Junki Yano, Hiroshima University
Continuous measurement of current velocity in complex flow fields

Undergraduate

2014 Junya Kagami, Hiroshima University
Investigating sediment transport induced by tidal bores

2014 Kotaro Takase, Hiroshima University
Observation of tidal current speed variations in the Neko-seto strait using two crossing ultrasonic transmission lines

2013 Takuya Nakai, Hiroshima University
Investigation of density current and salinity structures in a small estuary

2013 Takashi Kawamura, Hiroshima University
Real-time wireless transmission of Fluvial Acoustic Tomography System data

2012 Kazuhiko Ishikawa, Hiroshima University
Verification and establishment of new method for river discharge measurement

2012 Junki Yano, Hiroshima University
Long-term variations of discharge and salinity, and flow exchange in a tidal river

2011 Massao Ikeda, Hiroshima University
Applying acoustic tomography method to mesure discharge in a gravel-bed river

Research Cruises

Participated

2017-2018 4 research cruises, approximately 20 days with Oceaneering International

Dataset Submitted

2019 Vertical upwelling and bottom-boundary layer dispersal at a natural seep site
https://data.gulfresearchinitiative.org/data-discovery

Joint Research Activities

University of Minnesota (MN, USA)

2015 In collaboration with Drs. Alex Hay (Dalhousie University, NS) and Len Zedel (Memorial University, NF), I carried out the laboratory trials of SwathDop (a pulse-coherent Doppler multibeam sonar)

Dalhousie University (NS, Canada)

2014 In collaboration with Drs. Alex Hay, Len Zedel, Kiyosi Kawanisi (Hiroshima University), and Arata Kaneko (Hiroshima University), I deployed an array of Fluvial Acoustic Tomography system asses applicability of FAT in Grand Passage, NS, over 2 weeks

University of Ottawa (ON, Canada)

2014 In collaboration with Drs. Ioan Nistor (University of Ottawa, ON) and Colin Rennie (University of Ottawa, ON), I deployed a pair of Fluvial Acoustic Tomography system in Ottawa River, Ottawa, ON, to assess Fluvial Acoustic Tomography system performance in high turbidity

2013 In collaboration with Drs. Ioan Nistor and Colin Rennie, I deployed of Fluvial Acoustic Tomography system at the Rideau River, Ottawa, ON, to assess Fluvial Acoustic Tomography system performance in gravel bed rivers

2012 In collaboration with Drs. Ioan Nistor, Andrew Cornett (NRC Canadian Hydraulics Centre) and Mitchel Provan (MS student at uOttawa), I deployed Fluvial Acoustic Tomography system in Shippagan Gully, NB, to collect the data required for calibrating Coastal Modeling System (CMS) – a transport model developed by USACE – and designed a new jetty

University of Birmingham (UK)

2013 Transferred Fluvial Acoustic Tomography system technology (Dr. Soroosh Sharifi)

Relevant Industry Experience and Collaborations

2010- 2014 *Aqua Environmental Monitoring LLP, Hiroshima Japan*

Conducted field measurements in Hiroshima Bay to explore the effect of tide-induced current and temperature variability on oyster population. Results were used for enhancing environmental and agricultural policies

2009 *Fukken Co. Ltd., Hiroshima Japan (Intern)*

- Modeled a river flood and its corresponding effect on sediment erosion around a bridge pier
- Modeled suspended sediment flux and stability of sandbars along the Ota River Estuary, Hiroshima Japan, under a 25-year flood scenario

2008-2014 *Aratani Kensetsu Consultant Co., Hiroshima Japan*

- Established a permanent station of Fluvial Acoustic Tomography system in the Ota River Estuary to monitor river discharge and salinity intrusion in real time. The data have been used to
  - enhance the operation of the Gion Sluice Gates to: improve evidence-based flood mitigation policies, prevent contamination of aquifers near Hiroshima coastlines with saltwater
  - improve H-Q curves and flood hydrographs; in combination with moving-boat ADCP readings
- Collected field data along the Ota River Estuary to calibrate a 2D transport model
- Used the model to select the optimal sites and dimensions of artificial sandbars along the estuary

2008-2014 *Keisoku Research Consultant Co., Hiroshima Japan*

- Established a permanent station of Fluvial Acoustic Tomography system in the Gono River to monitor the river discharge in real time over multiannual period. The real-time data collected since 2010 have been used to
  - assess the available freshwater in the Gono River, a major source of freshwater for the city of Miyoshi, Hiroshima Prefecture Japan
  - monitor Haizuka Dam flushing to restore Ayu fish habitats
  - improve H-Q curves and flood hydrographs
  - manage floodplains
- Established a permanent station of Fluvial Acoustic Tomography system in upstream reaches of the Ota River to
  - Continuously monitor available freshwater at Takase Dam, a major source of

freshwater for the city of Hiroshima, Hiroshima Prefecture Japan
- monitor freshwater discharge and improving real-time flood monitoring techniques
- manage floodplains

Service

2018-2020	Tier I judge at the Georgia Science and Engineering Fair (GSEF)
2017	Mentor in ISL Language Partner Program at University of Georgia
2014	Vice-chair and presenter at Shallow Acoustic Tomography and its Applications in Rivers and Coastal Waters workshop, Hiroshima University

Reviewer for
Journal of Geophysical Research: Oceans
Coastal Engineering Journal (World Scientific)
Ocean Engineering
Journal of Hydraulic Engineering (ASCE)
Estuarine, Coastal and Shelf Science
Flow Measurement and Instrumentation
Hydrological Research Letters
Journal of Ocean Engineering (IEEE)

Outreach

2007-2014	Open campus day at Hiroshima University (explaining my research simply to junior highschool students and their parents)
2012	Explaining the goals of our field campain to the local fishermen through a formal gathering

Professional Affiliation

2014-	Acoustical Society of America
2014-	Canadian Meteorological and Oceanographic Society
2014-	Canadian Society for Civil Engineering
2007-2014	Japan Society of Civil Engineers

Skills

Programming Platforms
Mathematica, MATLAB (proficient)
Fortran (experienced)
Python, Visual Basic (knowledgeable)

Other Tools
AutoCAD (proficient)
EPANET, SWMM (proficient)
ETABS, SAFE, SAP (proficient)
Adobe Illustrator, Microsoft Office (proficient)
QPS Fledermaus and FMMidwater, ArcGIS, HEC-RAS, HEC-HMS (experienced)

Languages
English (Excellent)
Persian (Native)
Japanese (Excellent)
Spanish (Beginner)

Mahdi Razaz, PhD

October 5, 2020