

List of Publications and Presentations

Peer-reviewed international publications

1. Kadia, S., **Albayrak, I.**, Lia, L., R ther, N., Pummer, E. (2024). Reynolds Stress Model Study Comparing the Secondary Currents and Turbulent Flow Characteristics in High-speed Narrow Open Channel and Duct Flows. *Journal of Hydraulic Engineering* (accepted).
2. **Albayrak, I.**, Arnold, R., Demiral-Y z g ll , D., Maddahi, M., Boes, R.M. (2024). Field monitoring and modelling of sediment transport, hydraulics and hydroabrasion at Sediment Bypass Tunnels. *Journal of Hydro-environment Research* (accepted).
3. Kadia, S., Lia, L., **Albayrak, I.**, Pummer, E. (2024). The effect of cross-sectional geometry on the high-speed narrow open channel flows: An updated Reynolds stress model study. *Computers and Fluids*, 271, 106184, <https://doi.org/10.1016/j.compfluid.2024.106184>.
4. Yang, F., Moldenhauer-Roth, A., Boes, R.M., Zeng, Y., **Albayrak, I.** (2023). FishSeg: 3D Fish Tracking Using Mask R-CNN in Large Ethohydraulic Flumes. *Water*, 15, 3107, <https://doi.org/10.3390/w15173107>.
5. Kucukali, S., Alp, A., **Albayrak, I.** (2023). Retrofitting vertical slot fish pass with brush blocks: hydraulics performance. *Water*, 15(6):1155. <https://doi.org/10.3390/w15061155>.
6. Kucukali, S., Verep, B., **Albayrak, I.** (2022). Hydrodynamic characteristics of diagonal brush fish pass: prototype measurements. *Water*, 15, 88. <https://doi.org/10.3390/w15010088>.
7. Kadia, S., R ther, N., **Albayrak, I.**, Pummer, E. (2022). Reynolds Stress Modeling of Supercritical Narrow Channel Flows using OpenFOAM: Secondary Currents and Turbulent Flow Characteristics. *Physics of Fluids*, 34,125116, <https://doi.org/10.1063/5.0124076>.
8. Demiral, D., **Albayrak, I.**, Turowski, J.M., Boes, R.M. (2022). Particle saltation trajectories in supercritical open channel flows: roughness effect. *Earth Surface Processes and Landforms*, 47(15): 3588-3610. <https://doi.org/10.1002/esp.5475>.
9. Foldvik, A., Silva, A.T., **Albayrak, I.**, Schwarzw lder, K., Boes, R.M., R ther, N. (2022). Combining fish passage and sediment bypassing. A conceptual solution for increased sustainability of dams and reservoirs. *Water* 14(12):1977. <https://doi.org/10.3390/w14121977>.
10. Maddahi, M., Hagenb chli, R., Mendez, R., Zaugg, C., Boes, R.M., **Albayrak, I.** (2022). Field Investigation of Hydraulics and Fish Guidance Efficiency of a Horizontal Bar Rack-Bypass System, *Water* 14(5): 776. <https://doi.org/10.3390/w14050776>.
11. Meister, J., Selz, O.M., Beck, C., Peter, A., **Albayrak, I.**, Boes, R.M. (2022). Protection and guidance of downstream moving fish with horizontal bar rack bypass systems. *Ecological Engineering*, 178, 106584, <https://doi.org/10.1016/j.ecoleng.2022.106584>.
12. Meister, J., Moldenhauer-Roth, A., Beck, C., Selz, O.M., Peter, A., **Albayrak, I.**, Boes, R.M. (2021). Protection and Guidance of Downstream Moving Fish with Electrified Horizontal Bar Rack Bypass Systems. *Water*, 13(19), 2786, <https://doi.org/10.3390/w13192786>.
13. Beck, C., **Albayrak, I.**, Meister, J., Peter, A., Selz, O.M., Leuch, C.; Vetsch, D.F., Boes, R.M. (2020). Swimming Behavior of Downstream Moving Fish at Innovative Curved-Bar Rack Bypass Systems for

- Fish Protection at Water Intakes. *Water*, 12 (11), 3244, <https://doi.org/10.3390/w12113244>.
14. Demiral, D.; Boes, R.M., **Albayrak, I.** (2020). Effects of Secondary Currents on Turbulence Characteristics of Supercritical Open Channel Flows at Low Aspect Ratios. *Water*, 12 (11), 3233, <https://doi.org/10.3390/w12113233>.
 15. Müller-Hagmann, M., **Albayrak, I.**, Auel, C., Boes, R.M. (2020). Field investigation on hydroabrasion in high-speed sediment-laden flows at sediment bypass tunnels. *Water*, 12(2), 469, <https://doi.org/10.3390/w12020469>.
 16. **Albayrak, I.**, Boes, R.M., Kriewitz, C.R., Peter, A., Tullis, B.P. (2020). Fish guidance structures: hydraulic performance and fish guidance efficiencies. *Journal of Ecohydraulics*, 5(2), 113-131. <https://doi.org/10.1080/24705357.2019.1677181>.
 17. Meister, J., Fuchs, H., Beck, C., **Albayrak, I.**, Boes, R.M. (2020). Head losses of Horizontal Bar Racks as Fish Guidance Structures. *Water*, 12(2), 475, 1-22, <https://doi.org/10.3390/w12020475>.
 18. Meister, J., Fuchs, H., Beck, C., **Albayrak, I.**, Boes, R.M. (2020). Velocity fields at Horizontal Bar Racks as Fish Guidance Structures. *Water*, 12(1), 280, 1-22, <https://doi.org/10.3390/w12010280>.
 19. Beck, C., **Albayrak, I.**, Meister, J., Boes R.M. (2020). Hydraulic performance of fish guidance structures with curved bars: Part 1: Head loss assessment. *Journal of Hydraulic Research*, 58(5), 807-818, <https://doi.org/10.1080/00221686.2019.1671515>.
 20. Beck, C., **Albayrak, I.**, Meister, J., Boes R.M. (2020). Hydraulic performance of fish guidance structures with curved bars: Part 2: Flow fields. *Journal of Hydraulic Research*, 58(5): 819-830, <https://doi.org/10.1080/00221686.2019.1671516>.
 21. **Albayrak, I.**, Maager, F., Boes, R. M. (2020). An experimental investigation on fish guidance structures with horizontal bars. *Journal of Hydraulic Research*, 58(3): 516-530, <https://doi.org/10.1080/00221686.2019.1625818>.
 22. Beck, C., Meister, J., Fuchs, H., **Albayrak, I.**, Boes R.M. (2019). Comment on "Experimental hydraulics on fish-friendly trash-racks: an ecological approach". *Ecological Engineering*, 130:196-197, <https://doi.org/10.1016/j.ecoleng.2019.02.013>.
 23. Felix, D., **Albayrak, I.**, Boes, R.M. (2018). In-situ investigation on real-time suspended sediment measuring techniques: turbidimetry, acoustic attenuation, laser diffraction (LISST) and vibrating tube densimetry. *International Journal of Sediment Research*, 33(1): 3–17, <https://doi.org/10.1016/j.ijsrc.2017.11.003>.
 24. **Albayrak, I.**, Kriewitz, C. R., Hager, W. H., Boes, R. M. (2018). An experimental investigation on louvres and angled bar racks. *Journal of Hydraulic Research*, 56(1): 59-75, <https://doi.org/10.1080/00221686.2017.1289265>.
 25. Auel, C., **Albayrak, I.**, Sumi, T., Boes, R.M. (2017). Sediment transport in high-speed flows over a fixed bed: 1. Particle dynamics. *Earth Surface Processes and Landforms*, 42(9): 1365-1383, <https://doi.org/10.1002/esp.4128>.
 26. Auel, C., **Albayrak, I.**, Sumi, T., Boes, R.M. (2017). Sediment transport in high-speed flows over a fixed bed: 2. Particle impacts and abrasion prediction. *Earth Surface Processes and Landforms*, 42(9): 1384-1396, <https://doi.org/10.1002/esp.4132>.
 27. Felix, D., **Albayrak, I.**, Boes, R.M. (2016). Continuous measurement of suspended sediment concentration: Discussion of four techniques. *Measurement*, 89: 44-47, <https://doi.org/10.1016/j.measurement.2016.03.066>.

28. Auel, C., **Albayrak, I.**, Boes, R.M. (2014). Turbulence characteristics in supercritical open channel flows: Effects of Froude number and aspect ratio. *Journal of Hydraulic Engineering*, 140(4), 04014004, [https://doi.org/10.1061/\(ASCE\)HY.1943-7900.0000841](https://doi.org/10.1061/(ASCE)HY.1943-7900.0000841).
29. **Albayrak, I.**, Kriewitz, C. R., Hager, W.H., Boes, R.M. (2014). An experimental study on fish-friendly trashracks: Part I & II. *Journal of Hydraulic Research*, 52(1): 144-147, <https://doi.org/10.1080/00221686.2013.876455>.
30. **Albayrak, I.**, Nikora, V., Miler, O., O'Hare, M. (2014). Flow–plant interactions at leaf, stem and shoot scales: drag, turbulence, and biomechanics. *Aquatic Sciences* 76(2): 269-294, <https://doi.org/10.1007/s00027-013-0335-2>.
31. Miler, O., **Albayrak, I.**, Nikora, V., O'Hare, M. (2014). Biomechanical properties and morphological characteristics of lake and river plants: implications for adaptations to flow conditions. *Aquatic Sciences* 76(4): 465-481, <https://doi.org/10.1007/s00027-014-0347-6>.
32. Felix, D., **Albayrak, I.**, Boes, R.M. (2013). Laboratory investigation on measuring suspended sediment by portable laser diffractometer (LISST) focusing on particle shape. *Geo-marine Letters* 33(6): 485-498, <https://doi.org/10.1007/s00367-013-0343-1>.
33. Cameron, S.M., Nikora, V., **Albayrak, I.**, Miler O., Stewart, M., Siniscalchi, F. (2013). Interactions between aquatic plants and turbulent flow: A field study using stereoscopic PIV. *Journal of Fluid Mechanics*, 732: 345-372, <https://doi.org/10.1017/jfm.2013.406>.
34. **Albayrak, I.**, Nikora, V., Miler, O., O'Hare, M. (2012). Flow-plant interactions at a leaf scale: effects of leaf shape, serration, roughness and flexural rigidity. *Aquatic Sciences*, 74(2): 267-286, <https://doi.org/10.1007/s00027-011-0220-9>.
35. Miler, O., **Albayrak, I.**, Nikora, V., O'Hare, M. (2012). Biomechanical properties of aquatic plants and their effects on plant–flow interactions in streams and rivers. *Aquatic Sciences* 74(1): 31-44, <https://doi.org/10.1007/s00027-011-0188-5>.
36. **Albayrak, I.**, Lemmin, U. (2011). Secondary currents and surface boils in a turbulent open-channel flow over a rough bed. *Journal of Hydraulic Engineering*, 137(11): 1318-1334, [https://doi.org/10.1061/\(ASCE\)HY.1943-7900.0000438](https://doi.org/10.1061/(ASCE)HY.1943-7900.0000438).
37. **Albayrak, I.**, Hopfinger, E. J., Lemmin U. (2008). Near field flow structure of a confined wall jet on flat and concave rough walls. *Journal of Fluid Mechanics*, 606: 27-49, <https://doi.org/10.1017/S0022112008001444>.
38. Cokgor, S., **Albayrak, I.**, Yegen, B. (2008). The spatial Inhomogeneity of turbulence over large relative random roughnesses in Open-Channel Flow. *Inter. J. Fluid. Mech. Res.*, 35: 299-317.

Other Journal Articles

1. Meister, J., Beck, C., **Albayrak, I.**, Boes, R.M. (2021). Hydraulik und betriebliche Aspekte von Horizontalrechen-Bypass-Systemen (Hydraulics and Operational Aspects of Horizontal Bar Rack – Bypass System). *Wasserwirtschaft*, 111(9/10): 20-27. Doi: 10.1007/s35147-021-0888-2.
2. Meister, J., Beck, C., Selz, O.M., Peter, A., **Albayrak, I.**, Boes, R.M. (2021). Bemessungsempfehlungen für den Fischschutz mit Horizontalrechen-Bypass Systemen (Dimensioning recommendations for Fish Protection with Horizontal Bar Rack – Bypass System). *Wasserwirtschaft*, 111(9/10): 28-33. doi: 10.1007/s35147-021-0886-4.

3. Beck, C., **Albayrak, I.**, Meister, J., Leuch, C., Vetsch, D., Peter, A., Boes, R. (2021). Curved-Bar-Rack-Bypass-Systeme für den Fischschutz an Wasserkraftanlagen und Wasserfassungen (Curved-Bar Rack-Bypass System for Fish Protection at Hydropower Plants and Water Intakes). *Wasserwirtschaft*, 111(9/10): 54-61. Doi: 10.1007/s35147-021-0897-1.
4. Boes, R., **Albayrak, I.**, Lucien, M. (2021). Behind the scenes of fish friendly hydropower. *Intl. Water Power and Dam Construction* 73(4): 44-45.
5. **Albayrak, I.**, Felix, D., Schmocker, L., Boes R.M. (2018). Research projects on reservoir sedimentation and sediment routing at VAW, ETH Zurich, Switzerland. *Reservoir Sedimentation-2* (Abderrezzak, K.E.K., ed), Hydrolink, 4: 105-107.
6. Felix, D., Abgottspon, A., **Albayrak, I.**, Staubli, T., Boes, R.M. (2018). Dealing with Pelton turbine erosion based on systematic monitoring. *Hydropower & Dams*, 25(5): 84-92.
7. Felix, D., **Albayrak, I.**, Boes, R. (2017). Weiterleitung von Feinsedimenten via Triebwasser als Massnahme gegen die Stauraumverlandung. *Wasser Energie Luft*, 109(2): 85- 90 (in German), https://issuu.com/swv_wel/docs/wel_2_2017/19.
8. Boes, R., **Albayrak, I.**, Friedl, F., Rachely, C., Schmocker, L., Vetsch, D., Weitbrecht, V. (2017). Geschiebedurchgängigkeit an Wasserkraftanlagen. *Aqua Viva*, 2: 23-27.
9. Boes, R., **Albayrak, I.**, Kriewitz, C. R., Peter, A., (2016). Fischschutz und Fischabstieg mittels vertikaler Leitreechen-Bypass-Systeme: Rechenverluste und Leiteffizienz (Fish protection and downstream fish migration by means of guidance systems with vertical bars: head loss and bypass efficiency). *Wasser Wirtschaft*, 7(8), 29-35.
10. Hagmann, M., **Albayrak, I.**, Boes, R.M., Auel, C., Sumi, T. (2016). Reviewing research and experience on sediment bypass tunnels. *Intl. Jl. on Hydropower & Dams* 23(1): 54-58.
11. Boes, R.M., **Albayrak, I.**, Kriewitz, C.R., Peter, A. (2015). Fischabstieg mittels Leitreechen - aktueller Forschungsstand ('Racks to guide downstream migrating fish – current state-of-the art'). *Aqua viva* 57(4): in press (in German).
12. Kriewitz, C.R., **Albayrak, I.**, Flügel, D., Bös, T., Peter, A., Boes, R.M. (2015). Forschungsprojekt „Massnahmen zur Gewährleistung eines schonenden Fischabstiegs an grösseren mitteleuropäischen Flusskraftwerken“ ('Research Project: Measures to facilitate safe downstream fish migration at large central European rivers'). *Wasser, Energie, Luft* 107(1): 17-28 (in German), https://issuu.com/swv_wel/docs/wel_1_2015.
13. Abgottspon, A., Staubli, T., Felix, D., **Albayrak, I.**, Boes, R.M. (2014). Monitoring Suspended Sediment and Turbine Efficiency. *Hydro Review Worldwide*, 22(4): 28-36.
14. Kriewitz, C.R., Boes, R.M., **Albayrak, I.** (2013). Massnahmen zur Gewährleistung eines schonenden Fischabstiegs ('Measures to facilitate safe downstream fish migration at large central European rivers'). *Aqua viva* 55(5), 17-21 (in German).
15. Boes, R.M., Felix, D., **Albayrak, I.** (2013). Schwebstoffmonitoring zum verschleissoptimierten Betrieb von Hochdruck-Wasserkraftanlagen ('Suspended sediment monitoring to minimize wear at high-head HPP'). *Wasser Energie Luft* 105(1): 35-42 (in German), https://issuu.com/swv_wel/docs/wel_1_2013/4.

Monographs & Book Contributions

1. Moldenhauer-Roth, A., Lambert, D., Müller, M., **Albayrak, I.**, Lauener, G. (2023). Improving fish

- protection and downstream movement at the Maigrauge Dam (Switzerland) using an electric barrier. Role of Dams and Reservoirs in a Successful Energy Transition: Proceedings of the 12th ICOLD European Club Symposium 2023 (ECS 2023, Interlaken, Switzerland, 5-8 September 2023) (1st ed.) (Boes, R., Droz, P., & Leroy, R., Eds.). CRC Press: 540-547.
<https://doi.org/10.1201/9781003440420>
2. Dahal, S., Maddahi, M., **Albayrak, I.**, Evers, F.M., Vetsch, D.F., Stern, L., Boes, R. (2023). Efficiency evaluation and simulation of sediment bypass tunnel operation: case study Solis reservoir. Role of Dams and Reservoirs in a Successful Energy Transition: Proceedings of the 12th ICOLD European Club Symposium 2023 (ECS 2023, Interlaken, Switzerland, 5-8 September 2023) (1st ed.) (Boes, R., Droz, P., & Leroy, R., Eds.). CRC Press: 469-478. <https://doi.org/10.1201/9781003440420>
 3. **Albayrak, I.**, Baumgartner, L., Boes, R.M. et al. (2022). *A Roadmap for Best Practice Management on Hydropower and Fish* (Nielsen, N. & Szabo-Mezzaros, M., eds.). IEA Hydro report on Annex XIII Hydropower and Fish, 170 pp. <https://doi.org/10.5281/zenodo.7805685>.
 4. Rutschmann, P., Kampa, E., Wolter, C., **Albayrak, I.**, David, L., Stoltz, U., Schletterer, M. (2022). *Novel Developments for Sustainable Hydropower*. Cham, Springer Nature Switzerland AG.
 5. Peter, A., Schoelzel, N., Wilmsmeier, L., **Albayrak, I.**, Bravo-Córdoba, F.J., García-Vega, A., Fuentes-Pérez, J.F., Valbuena-Castro, J., Carazo-Cea, O., Escudero-Ortega, C., Sanz-Ronda, F.J., Calluud, D., Pineau, G., David, L. (2022). The Attractiveness of Fishways and Bypass Facilities. *Novel Developments for Sustainable Hydropower* (Rutschmann, P., Kampa, E., Wolter, C., Albayrak, I., David, L., Stoltz, U., Schletterer, M., eds.), Springer, Cham: 61-81. https://doi.org/10.1007/978-3-030-99138-8_5.
 6. David, L., Chatellier, L., Courret, D., **Albayrak, I.**, Boes, R.M. (2022). Fish Guidance Structures with Narrow Bar Spacing: Physical Barriers. *Novel Developments for Sustainable Hydropower* (Rutschmann, P., Kampa, E., Wolter, C., Albayrak, I., David, L., Stoltz, U., Schletterer, M., eds.), Springer, Cham: 91-98. https://doi.org/10.1007/978-3-030-99138-8_7
 7. **Albayrak, I.**, Boes, R.M. (2022). Fish Guidance Structure with Wide Bar Spacing: Mechanical Behavioural Barrier. *Novel Developments for Sustainable Hydropower* (Rutschmann, P., Kampa, E., Wolter, C., Albayrak, I., David, L., Stoltz, U., Schletterer, M., eds.), Springer, Cham: 99-104. https://doi.org/10.1007/978-3-030-99138-8_8
 8. Boes, R.M., Baumer, A., Pfeifer, S., **Albayrak, I.**, Felix, D. (2022). Techniques to reduce sedimentation in bed load and suspended load dominated reservoirs. In *Proc. 27th Congress of the international commission on large dams (ICOLD)*, June 2021, Marseille, France, CRC Press. DOI: 10.1201/9781003211808.
 9. Felix, D.; **Albayrak, I.**, Boes, R.M. (2016). Combining in-situ laser diffraction (LISST) and vibrating tube densimetry to measure low and high-suspended sediment concentrations. *River Sedimentation* (Wieprecht, S., Haun, S., Weber, K., Noack, M., Terheiden, K., eds.), ISBN 978-1-138-02945-3, Taylor & Francis Group, London: 1264-1271.
 10. **Albayrak, I.**, Boes, R.M. (2015). Current sedimentation research at VAW. *Proc. Intl. Workshop on Sediment Bypass Tunnels, VAW-Mitteilung 232*, (Boes, R.M., ed.), VAW, ETH Zürich, 157-168.
 11. Auel, C., **Albayrak, I.**, Sumi, T., Boes, R.M. (2015). Saltation-abrasion model for hydraulic structures. *Proc. Intl. Workshop on Sediment Bypass Tunnels, VAW-Mitteilung 232*, (Boes, R.M., ed.), VAW, ETH Zürich, 101-121.
 12. Haggmann, M., **Albayrak, I.**, Boes, R.M. (2015). Field research: Invert material resistance and sediment transport measurements. *Proc. Intl. Workshop on Sediment Bypass Tunnels, VAW-Mitteilung 232*, (Boes, R.M., ed.), VAW, ETH Zürich, 123-135.

13. **Albayrak, I.**, Kriewitz, C.R., Boes, R.M. (2014). Downstream fish passage technologies: Experiences on the Columbia and Snake rivers. *Proc. Symposium „Wasserbau und Flussbau im Alpenraum“*, VAW-Mitteilung 227 (R. Boes, ed.), VAW, ETH Zürich: 261-271.
14. Auel, C., **Albayrak, I.**, Boes, R.M. (2014). Laborversuche über die Partikelbewegung in schiessendem Abfluss ('Laboratory experiments on particle motion in supercritical flows'). *Proc. Symposium „Wasserbau und Flussbau im Alpenraum“*, VAW-Mitteilungen 227 (R. Boes, ed.), VAW, ETH Zürich: 147-156 (in German).
15. Auel, C., **Albayrak, I.**, Boes, R.M. (2014). Bedload particle velocity in supercritical open channel flows. *Proc. Intl. River Flow Conference* (Schleiss, A.J., De Cesare, G., Franca, M.J., Pfister, M., eds.), ISBN 978-1-138-02674-2, Taylor & Francis Group, London, UK: 923-931.
16. Boes, R.M., Auel, C., Hagmann, M., **Albayrak, I.** (2014). Sediment bypass tunnels to mitigate reservoir sedimentation and restore sediment continuity. *Reservoir Sedimentation* (Schleiss, A.J., De Cesare, G., Franca, M.J., Pfister, M., eds.), ISBN 978-1-138-02675-9, Taylor & Francis Group, London, UK: 221-228.
17. Felix, D., **Albayrak, I.**, Boes, R.M. (2014). Variation des Feinsedimentgehalts im Triebwasser infolge Speicherstollenbewirtschaftung ('Variation of suspended sediment load in a penstock due to operation of a storage tunnel'). *Proc. Symposium „Wasserbau und Flussbau im Alpenraum“*, VAW-Mitteilungen 227 (R. Boes, ed.), VAW, ETH Zürich: 183-193 (in German).
18. Hagmann, M., **Albayrak, I.**, Boes, R.M. (2014). Untersuchung verschleissfester Materialien im Wasserbau mit in-situ-Geschiebetransportmessung ('Investigation of wear-resistant materials at hydraulic structures: in-situ measurements of sediment transport and invert abrasion'). *Proc. Symposium „Wasserbau und Flussbau im Alpenraum“*, VAW-Mitteilungen 227 (R. Boes, ed.), VAW, ETH Zürich: 97-106 (in German).
19. Kriewitz, C.R., **Albayrak, I.**, Boes, R.M. (2014). Hydraulische Modellversuche zum Fischabstieg an grossen Flusskraftwerken ('Hydraulic model investigation on downstream fish migration at large river hydro powerplants'). *Proc. Symposium „Wasserbau und Flussbau im Alpenraum“*, VAW-Mitteilungen 227 (R. Boes, ed.), VAW, ETH Zürich: 273-282 (in German).
20. **Albayrak, I.**, Auel, C., Boes, R.M. (2013). Supercritical flow in sediment bypass tunnels. *Advances in River Sediment Research* (S. Fukuoka, H. Nakagawa, T. Sumi, H. Zhang, eds.), ISBN 978-1-138-00062-9, Taylor & Francis Group, London, UK: 1867-1875.
21. Felix, D., **Albayrak, I.**, Boes, R.M. (2013). Monitoring of suspended sediment – Laboratory tests and case study in the Swiss Alps. *Advances in River Sediment Research* (S. Fukuoka, H. Nakagawa, T. Sumi, H. Zhang, eds.), ISBN 978-1-138-00062-9, Taylor & Francis Group, London, UK: 1757-1766.
22. Nikora, V., Cameron, S., **Albayrak, I.**, Miler, O., Nikora N., Siniscalchi, F., Stewart, M., O'Hare M (2012). Environmental Fluid Mechanics: Memorial Volume in honour of Prof. Gerhard H. Jirka (IAHR Monographs), Chapter 11, CRC Press/Balkema, Oxford, ISBN-10: 0415670454, ISBN-13: 978-0415670456.
23. **Albayrak, I.** (2008). An experimental study of coherent structures, secondary flows and surface boils and their interrelation in open-channel flow. *PhD thesis*, Environmental Hydraulics Laboratory (Laboratoire d'Hydraulique Environnementale, LHE), Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland.

Peer-reviewed articles in conference proceedings

1. Streule, C., Süß, G., Maddahi, M., Boes, R.M., **Albayrak, I.** (2023). Comparison of four-transducer UVP configuration and ADV for flow velocity and turbulence measurements. In *Proc. of the 40th IAHR World Congress. Rivers-Connecting Mountains and Coasts* 21-25 August 2023, Vienna, Austria, https://doi.org/10.3850/978-90-833476-1-5_iahr40wc-p0676-cd.
2. Moldenhauer-Roth, A., Selz, O.M., **Albayrak, I.**, Boes, R.M. (2023). Retrofitting Trash Racks with Electricity to Protect Downstream Moving Fish. In *Proc. of the 40th IAHR World Congress. Rivers-Connecting Mountains and Coasts* 21-25 August 2023, Vienna, Austria, https://doi.org/10.3850/978-90-833476-1-5_iahr40wc-p0512-cd.
3. Kastinger, M., **Albayrak, I.**, Luiz G. M. Silva, Boes, R.M. (2023). Passage of Downstream Moving Fish at a Bypass Gate with Bottom Opening. In *Proc. of the 40th IAHR World Congress. Rivers-Connecting Mountains and Coasts* 21-25 August 2023, Vienna, Austria, https://doi.org/10.3850/978-90-833476-1-5_iahr40wc-p0082-cd.
4. Kastinger, M., **Albayrak, I.**, Silva, L.G.M., Boes, R. (2023). Passage stromabwärts schwimmender Fische an einem Bypass-Einlauf mit bodennaher Öffnung. In *Proc. of 21. Wasserbau-Symposium: Wasserbau - krisenfest und zukunftsweisend*, Wallgau, Germany, June 28-30, 2023, Volume 2, 21-28. <https://doi.org/10.3929/ethz-b-000623631>.
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Patents and licenses

A patent application of our recently developed 'Fish Guidance Structure with Innovative Curved-Bars (FIGUS)' for safe downstream fish migration at water intakes and hydropower plants has been submitted to the European Patent Office (Patent application number: EP21155988.5). The inventors of the FIGUS are Dr. Claudia Beck (former PhD student), **Dr. Ismail Albayrak**, Prof. Dr. Robert Boes, Dr. David Vetsch, Claudia Leuch, Res Lütshg and Tobias Rüesch.

Presentations

1. Downstream fish passage at Hydropower Plant Laudal on River Mandal in Norway. Workshop "Lösungen für Fischschutz und Fischabstieg", Innsbruck, Österreich, 22.09.2023.
2. *Efficiency Evaluation of Solis Sediment Bypass Tunnel in Switzerland*. 40th IAHR World Congress, Vienna, Austria, 23.08.2023.
3. Live-fish tests of turbulent eddy generating elements. *FishPath workshop*, Zurich, Switzerland, 28 April 2022.
4. Development of Low-Voltage Electrified Fish Guidance Racks for Safe Downstream Fish Migration. In *Proc. of the 39th IAHR World Congress*, 19–24 June 2022, Granada, Spain, 2022.
5. Swiss Sediment Bypass Tunnels, *1st IAHR Online forum: Hydro-Environmental Challenges, Solutions and Trends for Water Security*, webinar, July 2021.
6. Ergebnisse des EU Horizon 2020 Projektes „FITHYDRO“ (Results from EU Horizon 2020 project of FIThydro). Webinar on 'Fish protection and fish downstream migration at large hydropower plant: sharing of experiences and knowledge' organized by International Commission for the Protection of

- the Rhine, 16 September **2021**.
7. Determining minimum number of transects for accurate flow measurements using moving vessel ADCPs. *13th Symposium on Ultrasonic Doppler Methods for Fluid Mechanics and Fluid Engineering*, Zurich, Switzerland, 14 June **2021**.
 8. Cost-effective and applicable solutions for hydropower impacts on downstream migration. *FIThydro European Stakeholder Workshop on Fish-Friendly Hydropower*, Brussels, Belgium, 29 January **2020**.
 9. Concept for the development of fish passage facility using ADCP, numerical modelling and fish monitoring. *FIThydro European Stakeholder Workshop on Fish-Friendly Hydropower*, Brussels, Belgium, 29 January **2020**.
 10. Bed-load diversion with a vortex tube system. *The 38th IAHR World Congress*, Panama City, Panama, **2019**.
 11. Requirements for monitoring from a hydraulic-constructive and fish-biological point of view. *Workshop on fish protection and downstream fish migration at hydroelectric power plants - New research approaches (VAW & Wasser Agenda 21)*, Zurich, Switzerland, **2019**.
 12. FIThydro studies in Switzerland. *Workshop on fish passage, Safepass - FIThydro*, Zurich, Switzerland, **2019**.
 13. Overview of VAW's BFE research projects. *Mini-workshop on energy research (VAW & BFE)*, Zurich, Switzerland, **2019**.
 14. 3D fish tracking system. *4th General Assembly of FIThydro*, Trondheim, Norway, **2019**.
 15. Vortex tube study results from Schiffmühle. *4th General Assembly of FIThydro*, Trondheim, Norway, **2019**.
 16. Specific design of two exemplary sediment bypass tunnels. *Workshop: Combined sediment and fish bypass solutions, win-win?*, Trondheim, Norway, 2019.
 17. Overview on VAW's research on sediment management at hydropower plants and sediment bypass tunnels. *Mini-workshop on Sediment Management at Hydropower Plants & Dams (VAW & HydroSediNet organized by World Bank)*, Zurich, Switzerland, **2019**.
 18. Efficiency evaluation of Swiss Sediment Bypass Tunnels. *3rd International Workshop on Sediment Bypass Tunnels*, Taipei, Taiwan, **2019**.
 19. Specific design of two exemplary sediment bypass tunnels. *Workshop: Combined sediment and fish bypass solutions, win-win?*, Trondheim, Norway, **2019**.
 20. Fish guidance structures at hydropower plants. *Workshop: Combined sediment and fish bypass solutions, win-win?*, Trondheim, Norway, **2019**.
 21. Field experiences with an ADCP mounted on a remotely operated boat. *FIThydro Measurement Workshop*, Lisbon, Portugal, **2019**.
 22. 3D fish tracking system for etho-hydraulic investigations. *FIThydro Measurement Workshop*, Lisbon, Portugal, **2019**.
 23. Downstream fish passage at hydropower plants by fish guidance structures. *Hydro 2018 Conference*, Gdansk, Poland, **2018**.
 24. FIThydro activities related to downstream fish migration for medium-to-large hydropower plans. *Alpine*

- Stakeholder Workshop*, Augsburg, Germany, **2018**.
25. Fish downstream fish migration: significance and concepts. *3rd General Assembly of FITHydro*, Zurich, Switzerland, **2018**.
 26. Calibration of Swiss Plate Geophone System for bedload monitoring in a sediment bypass tunnel. *2nd Intl. Workshop on Sediment Bypass Tunnels*, Kyoto, Japan, **2017**.
 27. Fish guidance structures: new head loss formula and fish guidance efficiencies. *The 37th IAHR World Congress*, Kuala Lumpur, Malaysia, **2017**.
 28. Field calibration of bedload monitoring system in a sediment bypass tunnel: Swiss plate geophone. *The 37th IAHR World Congress*, Kuala Lumpur, Malaysia, **2017**.
 29. Addressing downstream impact of sediment management on reservoirs. *2nd General Assembly of FITHydro*, Poitiers, France, **2017**.
 30. Solutions for downstream migration. *2nd General Assembly of FITHydro*, Poitiers, France, **2017**.
 31. Horizon 2020: FITHydro. *Meeting at TU-Darmstadt*, Darmstadt, Germany, **2017**.
 32. Horizon 2020: FITHydro. *Meeting at Bundesanstalt für Wasserbau (BAW)*, Karlsruhe, Germany, **2017**.
 33. Horizon 2020: FITHydro. *Wasser-Agenda 21. Informations- und Erfahrungsaustausch zur Sanierung Fischgängigkeit*, Bern, Switzerland, **2017**.
 34. Field calibration of bedload monitoring system in a sediment bypass tunnel: Swiss plate geophone. *The 13th International Symposium on River Sedimentation*, Stuttgart, Germany, **2016**.
 35. Real-time measurements of suspended sediment concentration and particle size using five techniques. *The 28th IAHR Symposium on Hydraulic Machinery and Systems*, Grenoble, France, **2016**.
 36. Research on downstream fish passage technologies in Switzerland. *Workshop on fish passage and migration*, Istanbul, Turkey, **2016**.
 37. Current sedimentation research at VAW. *First International Workshop on Sediment Bypass Tunnels*, VAW, ETH Zurich, Zurich, Switzerland, **2015**.
 38. Flow fields around fish guidance structures. *The 36th IAHR World Congress*, The Hague, the Netherlands, **2015**.
 39. Turbulent flow field around angled bar racks. *Fish Passage 2015*, Groningen, the Netherlands, **2015**.
 40. Suspended sediment and bed load transport monitoring techniques. *The 38th Dresdner Wasserbaukolloquium*, Dresden, Germany, **2015**.
 41. Field measurements of suspended sediments using several methods. *The 36th IAHR World Congress*, The Hague, Netherlands, **2015**.
 42. Sediment handling at hydropower schemes: Current research at VAW. *Seminar on Sediment Challenges and Sediment Handling Strategies in Hydro Power organized by Statkraft, Norwegian Hydropower Centre (NVKS) and Norwegian University of Science and Technology (NTNU)*, Tirana, Albania, **2015**.
 43. Sediment bypass tunnels: Hydro-abrasion and sediment transport measurements. *Seminar on*

- Sediment Challenges and Sediment Handling Strategies in Hydro Power organized by Statkraft, Norwegian Hydropower Centre (NVKS) and Norwegian University of Science and Technology (NTNU), Tirana, Albania, 2015.*
44. Hydraulics and efficiency of fish guidance structures. *Colloquium "Meet and Share Your Research Day" organized by ASB (Association of Academic Staff at D-BAUG) und Departement Bau, Umwelt und Geomatik, ETH Zürich, Zürich, Switzerland, 2015.*
 45. Upstream and downstream fish passage technologies. *Workshop on fish passages at hydropower plants, Rize Univesity, Rize, Turkey, 2015.*
 46. Turbulent flow field around angled bar racks. *Yellow Colloquium, VAW, ETH Zurich, Zurich, Switzerland, 2015.*
 47. Monitoring of suspended sediment – Laboratory tests and case study in the Swiss Alps. *12th International symposium on River Sedimentation (ISRS 2013), Kyoto, Japan, 2013.*
 48. Supercritical flow in sediment bypass tunnels. *12th International symposium on River Sedimentation (ISRS 2013), Kyoto, Japan, 2013.*
 49. Interactions between flow and plant leaves, stems, and shoots. *9th International Symposium on Ecohydraulics (ISE), Vienna, Austria, 2012.*
 50. The physical mechanisms of drag control by aquaitic plants in flowing water at leaf and shoot scales. *Seminar for doctoral students, VAW, ETH Zurich, Zurich, Switzerland, 2011.*
 51. Physical mechanisms of drag reduction by aquatic plants in flowing water at leaf and shoot scales. *24th annual Scottish Fluid Mechanics Meeting, Glasgow, Scotland, UK, 2011.*
 52. Flow-Plant Interaction at a Leaf Scale: Effects of Leaf Shape and Flexural Rigidity. *International Conference of Fluvial Hydraulics (River Flow 2010), Braunschweig, Germany, 2010.*
 53. Effects of plant leaf shape on drag forces imposed by water flow. *First IAHR European Congress, Edinburgh, Scotland, UK, 2010.*
 54. A study of open-channel surface flow dynamics using large scale particle image velocimetry. *International Conference on Fluvial Hydraulics (River Flow 2008), Izmir, Turkey, 2008.*
 55. The effect of water depth on the dynamics of secondary currents in turbulent open-channel flow over a rough bed. *International Conference on Fluvial Hydraulics (River Flow 2008), Izmir, Turkey, 2008.*
 56. Secondary currents and coherent structures, their distribution across section and their relation to surface boils in turbulent gravel-bed open-channel flow. *The Fifth International Symposium on Environmental Hydraulics (ISEH V), Tempe, Arizona, the Grand Canyon State, USA, 2007.*
 57. **Albayrak, I., Lemmin, U. (2007).** Large scale PIV-measurements on the water surface of turbulent open-channel flow. *18ème Congrès Français de Mécanique, Grenoble, France.*
 58. Secondary currents and coherent structures, their distribution across a cross section and their relation to surface boils in turbulent gravel-bed open-channel flow. *32nd Congress of IAHR, John F. Kennedy student competition, Venice, Italy, 2007.*
 59. Dynamics of secondary currents and surface boils in turbulent open-channel flow revealed by surface particle image velocity measurements. *The 32nd Congress of IAHR, Venice, Italy, 2007.*
 60. The scour-hole problem due to sluice gates: quadrant analysis of the turbulence characteristics in the presence of Görtler vortices. *International Conference on Fluvial Hydraulics (River Flow 2006), Lisbon,*

Portugal, **2006**.

61. An experimental study of coherent structures, secondary flows and surface boils and their interrelation in open-channel flow. *Master Class, International Conference on Fluvial Hydraulics (River Flow 2006)*, Lisbon, Portugal, **2006**.

Outreach activities

1. FishPath project on SFR Scheiz Aktuell: [Schweiz aktuell vom 16.10.2023 - Play SRF](#)
2. Safe Harbour for Migrating Fish and Cleaner Sustainable Energy, published on the international blog of in the field stories, <https://www.inthefieldstories.net/safe-harbour-for-migrating-fish-and-cleaner-sustainable-energy/> **2021**.
3. Towards more fish-friendly hydropower plants, [ETH Zurich Press release](#), **2021**.
4. Felix D., Abgottspon A., **Albayrak I.**, Staubli T., Gruber P., Boes R. (**2020**). Schwebstoffmonitoring in Echtzeit (Suspended sediment monitoring in real time). *Bulletin SEV/VSE*, 2/2020, 41-44.
5. Measures to facilitate safe downstream fish migration at run-of-river hydropower plants, [Rundschau TV program in Swiss Television SRF \(in German\)](#), **2018**.