

Karl Kaiser CV

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Education

Ph.D.	12/2009	University of South Carolina, Marine Science
M.S./B.S.	05/1997	Johannes Kepler University (Linz, Austria), Chemical Engineering ("Wirtschaftsingenieurwesen-Technische Chemie")

Employment History

2023-present	Professor, Marine and Coastal Environmental Science, Texas A&M
2019-present	Assistant Department Head, Marine and Coastal Environmental Science, Texas A&M
2018-2023	Associate Professor, Marine and Coastal Environmental Science, Texas A&M
2012–2018	Assistant Professor, Marine and Coastal Environmental Science, Texas A&M
2010-2012	Postdoctoral Researcher, Biological Sciences, Univ. of South Carolina
2004-2009	Ph.D. Program, Marine Sciences, Univ. of South Carolina
1999-2004	Research Associate, Biological Sciences, Univ. of South Carolina
1997-1999	Research Associate, Marine Science Institute, Univ. of Texas at Austin
1990-1991	Chemist, OMV Austria (petrochemicals and oil refining)

Academic Appointments

2013–Present	Graduate Faculty, Texas A&M, Department of Oceanography
2013-2019	Graduate Faculty, Texas A&M, Interdisciplinary Graduate Program in Marine Biology

Honors and Awards

Presidential Impact Fellow 2019
Chancellor EDGES Fellow 2019
Montague-CTE Scholar 2014-2015, Texas A&M University
Dissertations in Chemical Oceanography Symposium (sponsored by NSF) 2010.
University of South Carolina, Marine Science Program Publication Award 2009.
John F. Vernberg Publication Award 2008.
John F. Vernberg Publication Award 2006

Publications

- 68) Burns, A., Spencer, R., Kellerman, A., Yan, G., Leonard, L., **Kaiser, K.**, et al. (2024). The distinct composition and transformation of terrestrial organic carbon in the Yukon River delta and plume during the mighty spring freshet. *Journal of Geophysical Research: Biogeosciences*, 129(6), e2023JG007812.
- 67) Summers, E., Du, J., Park, K., & **Kaiser, K.** (2024). Quantifying the Connectivity of Microplastic Pollution in the Texas--Louisiana Coastal Area. *ACS ES&T Water*.
- 66) Weiser, M. W., Swanson, J., Ghosh, N., Hong, J., Harringmeyer, J. P., **Kaiser, K.**, & Fichot, C. G. (2024). Improving Estimates of Dissolved Organic Carbon (DOC) Concentration from In Situ Fluorescence Measurements across Estuaries and Coastal Wetlands. *Environmental Science & Technology*.
- 65) Amon, R. M., **Kaiser, K.**, & Engel, A. (2024). Dissolved organic matter in the Arctic Ocean. *Biogeochemistry of Marine Dissolved Organic Matter*, 693–737.

- 64) Nolen, R. M., Prouse, A., Russell, M. L., Bloodgood, J., Clark, C. D., Carmichael, R. H., **Kaiser, K.** et al. (2024). Evaluation of fatty acids and carnitine as biomarkers of PFOS exposure in biota (fish and dolphin) from Galveston Bay and the northwestern Gulf of Mexico. *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology*, 276, 109817.
- 63) Nolen, R. M., Petersen, L. H., **Kaiser, K.**, Quigg, A., & Hala, D. (2024). In silico biomarker analysis of the adverse effects of perfluorooctane sulfonate (PFOS) exposure on the metabolic physiology of embryo-larval zebrafish. *Frontiers in Systems Biology*, 4, 1367562.
- 62) Zhu, X., Weiser, M. W., Harringmeyer, J. P., **Kaiser, K.**, Walker, B. D., Bélanger, S., et al. (2024). The apparent quantum yield matrix (AQY-M) of CDOM photobleaching in estuarine, coastal, and oceanic surface waters. *Science of The Total Environment*, 912, 168670.
- 61) Minkoff, D., Ardren, **Kaiser, K.**, W.R., Dittman, A., Quinn, T., Atema, J., Taylor, B.W (2023), Spatiotemporal patterns of dissolved free amino acids in New England rivers could be unique and stable odor signatures for imprinting and homing by Atlantic salmon, *Freshwater Sci.*, 42, doi: 10.1086/728120.
- 60) Summers, E., Du, J., Park, K., **Kaiser, K.** (2023), How does buoyancy behavior impact microplastic transport in an estuarine environment?, *Sci. Total Env.*, 899, 165687, doi: 10.1016/j.scitotenv.2023.165687.
- 59) Myers-Pigg, A., **Kaiser, K.**, Benner, R., Ziegler, S. E., (2023), Soil organic matter diagenetic state informs boreal forest ecosystem feedbacks to climate change, *Biogeosciences*, 20, 489-503, doi: 10.5194/bg-20-489-2023.
- 58) Fadare, O.O. Martin, L., Lascelles, N., Myers, J.T., **Kaiser, K.**, Xu, W., Conkle, J. L. (2023), Binary solvent extraction of microplastics from a complex environmental matrix, *Limnol. Oceanogr. Methods*, 21, 414-420, doi: 10.1002/lom3.10554.
- 57) Williford, T., Amon, R.M.W., **Kaiser, K.**, Benner, R., Stedmon, C., Bauch, D., Fitzsimmons, J.N, Gerringa, L.J.A, Newton, R., Hansell, D.A., Granskog, M., Jensen, L., Laglera, L.M., Pasqualini, A., Rabe, B.J., Reader, H., Rutgers van der Loeff, R., Yan, G. (2022) Spatial complexity in dissolved organic matter and trace elements driven by hydrography and freshwater input across the Arctic Ocean during 2015 Arctic GEOTRACES expeditions, *J. Geophys. Res. Oceans*, 127, e2022JC018917, doi: 10.1029/2022JC018917.
- 56) Walker, J.R., Woods, A.C., Pierce, M.K, Steichen, J.L., Quigg, A., **Kaiser, K.**, Labonte, J.M. (2022), Functionally diverse microbial communities show resilience in response to a record-breaking rain event, *ISME Commun.*, 2, 82, doi: 10.1038/s43705-022-00162-z.
- 55) Nolen, R.M., Faulkner, P, Ross, AD, **Kaiser, K.**, Quigg, A., Hala, D. (2022), PFASs pollution in Galveston Bay surface waters and biota (shellfish and fish) following AFFFs use during the ITC fire at Deer Park (March 17th–20th 2019), Houston, TX, *Sci. Tot. Environ.* 805, doi: 10.1016/j.scitotenv.2021.150361.
- 54) Osburn, C., Pearl, H., Yan, G., and **K. Kaiser** (2021), Extreme Events are Accelerating Coastal Carbon Cycling, *Ocean Carbon & Biogeochemistry Highlights* (<https://www.us-ocb.org/extreme-events-cycling/>).
- 53) Williford, T., Amon, R., Benner, R., Bauch, D., **Kaiser, K.**, Stedmon, C., Yan, G., Walker, S., Schauer, U., Van der Loeff, M., Klunder, M (2021), Insights about the origins, molecular characteristics and distribution of iron-binding ligands in the Arctic Ocean, *Mar. Chem. Mar. Chem.* 231, doi: 10.1016/j.marchem.2021.103936.
- 52) Harrington, J., **Kaiser, K.**, Thompson, D., Gierach, M., Cash, C., Fichot, C. (2021), UV-visible imaging spectroscopy domain facilitates the detection and sourcing of CDOM-related water quality in urban coastal waters, *Frontiers in Mar. Sci.* 17, 10.3389/fenvs.2021.647966.

Web of Science Author Impact Beamplot

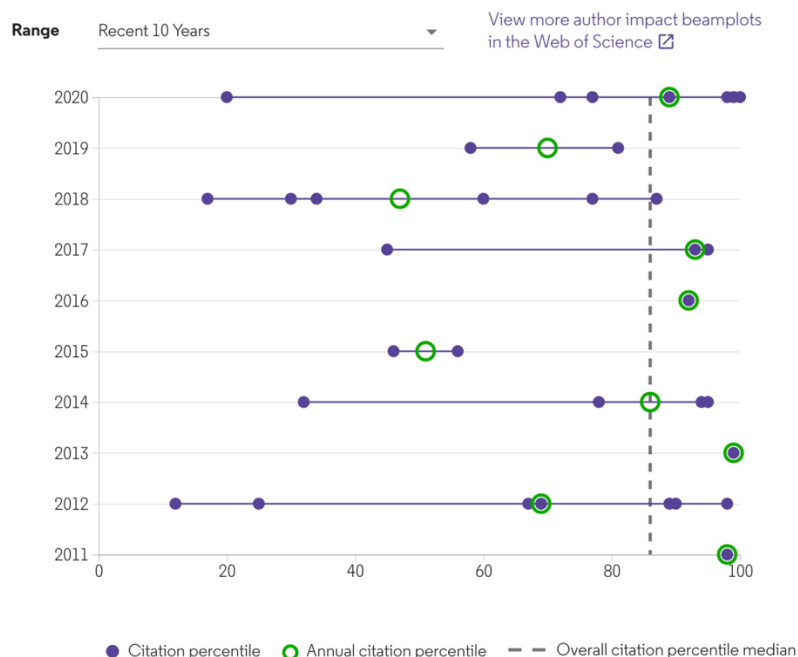


Fig. 3: Beamplot illustrating the impact of publications from 2011-2020. The overall citation percentile median of all publications is ~85 indicating top impact globally. Citation counts are from the Web of Science Core Collection, and citation percentile data are from InCites. The beamplot was generated through <http://publons.com>.

51) Loisel, J, Gallego-Sala, AV, Amesbury, MJ, Magnan, G, Anshari, G, Beilman, D, Benavides, JC, Blewett, J, Camill, P, Charman, DJ, Chawchai, S, Hedgpeth, A, Kleinen, T, Korhola, A, Large, D, Mansilla, CA, Müller, J, van Bellen, S, West, JB, Yu, Z, Bubier, J, Garneau, M, Moore, T, Sannel, ABK, Page, S, Väiliranta, M, Bechtold, M, Brovkin, V, Cole, LES, Chanton, JP, Christensen, TR, Davies, MA, De Vleeschouwer, F, Finkelstein, SA, Froking, S, Gałka, M, Gandois, L, Girkin, N, Harris, L, Heinemeyer, A, Hoyt, AM, Jones, MC, Joos, F, Juutinen, S, **Kaiser, K**, Lacourse, T, Lamentowicz, M, Larmola, T, Leifeld, J, Lohila, A, Milner, A, Minkinen, K, Morris, P, Moss, P, Naafs, BDA, Nichols, J, O'Donnell, J, Payne, R, Philben, M, Quillet, A, Ratnayake, AS, Roland, T, Sjogersten, S, Sonnentag, O, Swindles, GT, Swinnen, W, Talbot, J, Treat, C, Valach, AC, Wu, J, Piilo S. (2021), Future vulnerability of the global peatland carbon sink, *Nature Clim. Change*, 11, 70-77, doi.org/10.1038/s41558-020-00944-0.

50) G Yan, J Labonte, A Quigg, **K Kaiser** (2020), Hurricanes accelerate dissolved organic carbon cycling in coastal ecosystems, *Front. Mar. Sci.*, 7, doi:10.3389/fmars.2020.00248.

49) JL Steichen, J Labonté, R Windham, D Hala, **K Kaiser**, S Setta, P Faulkner, H Bacosa, G Yan, M Kamalanathan, A Quigg (2020), Microbial, physical, and chemical changes in Galveston Bay following an extreme flooding event, Hurricane Harvey, *Frontiers Mar. Sci.*, 7, doi:10.3389/fmars.2020.00186.

48) S. Wagner, F. Schubotz, **K. Kaiser**, C. Hallmann, H. Waska, P. E. Rossel, R. Hansmann, M. Elvert, J. J. Middelburg, A. Engel, T. M. Blattmann, T. S. Catala, S. T. Lennartz, G. V. Gomez-Saez, S. Pantoja-Gutierrez, R. Bao, V. Galy (2020), Soothsaying DOM: A Current Perspective on the Future of Oceanic Dissolved Organic Carbon, *Frontiers in Marine Science*, 7, doi: 10.3389/fmars.2020.00341.

47) Bacosa, H. P., J. Steichen, M. Kamalanathan, R. Windham, A. Lubguban, J. M. Labonte, **K. Kaiser**, D. Hala, P. H. Santschi, and A. Quigg (2020), Polycyclic aromatic hydrocarbons (PAHs) and putative PAH-degrading bacteria in Galveston Bay, TX (USA), following Hurricane Harvey (2017), *Environmental Science and Pollution Research*, 27(28), 34987-34999, doi: 10.1007/s11356-020-09754-5.

46) Ross, A. D., A. Hotard, M. Kamalanathan, R. Nolen, D. Hala, L. A. Clay, **K. Kaiser**, and A. Quigg (2020), Awareness Is Not Enough: Frequent Use of Water Pollution Information and Changes to Risky Behavior, *Sustainability*, 12(20), doi: 10.3390/su12208695.

45) M Charette, L Kipp, LT Jensen, JS Dabrowski, LM Whitmore, JN Fitzsimmons, T Williford, A Ulfso, E Jones, RM Bundy, SM Vivancos, K Pahnke, SG John, Y Xiang, M Hatta, MV Petrova, LE Heimbürger-Boavida, D Bauch, R Newton, A Pasqualini, AM Agather, RMW Amon, RF Anderson, PS Andersson, R

Benner, KL Bowman, RL Edwards, S Gdaniec, LJA. Gerringa, AG González, M Granskog, B Haley, CR Hammerschmidt, DA Hansell, PB Henderson, DC Kadko, **K Kaiser**, PJ Lam, Carl H. Lamborg, M Levier, X Li, AR Margolin, C Measures, FJ Millero, WS Moore, R Paffrath, H Planquette, B Rabe, H Reader, R Rember, MJA Rijkenberg, M Roy-Barman, M Rutgers van der Loeff, M Saito, U Schauer, P Schlosser, RM Sherrell, AM Shiller, H Slagter, JE Sonke, C Stedmon, RJ Woosley, O Valk, J van Ooijen, RZhang, (2020), The Transpolar Drift as a Source of Riverine and Shelf-Derived Trace Elements to the Central Arctic Ocean, *J Geophys Res - Oceans*, 125, e2019JC015920. doi.org/10.1029/2019JC015920.

44) JL Harfmann, F Guillemette, **K Kaiser**, RGM Spencer, CY Chuang, P Hernes (2019), Convergence of terrestrial dissolved organic matter composition and the role of microbial buffering in aquatic ecosystems, *Journal of Geophysical Research: Biogeosciences* 124 (10), 3125-3142

43) Xu, C., Zhang, S., Beaver, M., , Lin, P., , Sun, L., Doyle, J., Sylvan, J., Wozniak, A., Hatcher, P., **Kaiser, K.**, Yan, G., Schwehr, K., Lin, Y., Wade, T. L., Chin, W.-C., Chiu, M.-H., Quigg, A., Santschi, P. (2018), Bulk chemical composition of microbially-mediated exopolymeric substances (EPS) and their role in regulating Macondo oil transport in a mesocosm experiment. *Mar. Chem.*, in press, doi: 10.1016/j.marchem.2018.09.005.

42) Tamavalage, A, van Hengstum P., Louchouart, P., Molodtsov, S., **Kaiser, K.**, Donnelly, J., Allbury, N., Fall, P. (2018), Organic matter sources and lateral sedimentation in a Bahamian karst basin (sinkhole) over the late Holocene: influence of local vegetation and climate. *Palaeogeogr. Palaeoclimatol. Palaeoecol.*, 506, 70-83, doi:10.1016/j.palaeo.2018.06.014.

41) Yan, G. and **K. Kaiser** (2018), Ultra-low Sample Volume Cupric Sulfate Oxidation Method for the Analysis of Dissolved Lignin., *An. Chem.* 90, 15, 9289-9295, doi: 10.1021/acs.analchem.8b01867.

40) Yan, G., and **K. Kaiser** (2018) A rapid and sensitive method for the analysis of lignin phenols in environmental samples using ultra-high performance liquid chromatography-electrospray ionization-tandem mass spectrometry with multiple reaction monitoring, *Anal. Chim. Acta.* 1023, 74-80.

39) Al Mukaimi, M. E, **Kaiser, K.**, Williman, J. R., Dellapenna, T., Louchouart, P., Santschi, P. (2018) Centennial record of anthropogenic impacts in Galveston Bay: evidence from trace metals and biomarkers, *J. Env. Poll.*, 237, 887-899.

38) Shen, Y., Benner, R., **Kaiser, K.**, Fichot, C., Whittedge, T., Babin, M. (2018) Pan-Arctic distributions of bioavailable dissolved organic matter, *Geophys. Res. Lett.*, 45, 1490-1498.

-- as Assistant Professor

37) **Kaiser, K.**, Canedo, M., McMahon, R., Amon, R. (2017) Origins and transformations of organic matter in major Arctic rivers. *Nature Sci. Rep.* 7, doi:10.1038/s41598-017-1272.

36) Loisel, J., Yu, Z., Beilman, D., **Kaiser, K.**, Parnikoza, I. (2017). Past and present peatland development in Antarctica under warm climates. *Nature Sci. Rep.*, 7, 12344, DOI:10.1038/s41598-017-12479-0.

35) **Kaiser, K.**, Amon, R., and R. Benner (2017). The fate of terrigenous dissolved organic carbon on the Eurasian shelves and export to the North Atlantic. *J. Geophys. Res.- Oceans.*, 10.1002/2016JC012380.

34) Fichot, C. G., Benner, R., **Kaiser, K.**, Shen, Y., Amon, R., Ogawa, H., Chia-Jung Lu (2016). Predicting dissolved lignin phenol concentrations in the coastal ocean from chromophoric dissolved organic matter (CDOM) absorption coefficients, *Frontiers Mar. Sci.* 18, <http://dx.doi.org/10.3389/fmars.2016.00007>

33) Philben, M., Holmquist, J., MacDonald, G., Duan, D., **Kaiser, K.**, and R. Benner (2015), Strong correlation between oxygen exposure time and the extent of organic matter decomposition in a peat core from James Bay Lowland, *Global Biochem. Cycles* 10.1002/2014GB004989 .

- 32) Chiaki M., K. **Kaiser**, R. Benner, M. G. Weinbauer (2015). Effect of P-limitation on bacterial and viral production and the utilization of dissolved nitrogen in surface waters of the Northwestern Mediterranean Sea. *J. Plankton Res.*, 37, 16-20..
- 31) Philben, M., **K. Kaiser**, and R. Benner. Does oxygen exposure time control the extent of organic matter decomposition in peatlands? (2014). *J. Geophys. Res. Biogeochem.*, 119, 897-909.
- 30) Philben, M., **K. Kaiser**, and R. Benner (2014). Biochemical evidence for minimal vegetation change in peatlands of the West Siberian Lowland during the Medieval Climate Anomaly and Little Ice Age. *J. Geophys. Res. Biogeochem.*, 119, 808-825.
- 29) Landa, M., M.T. Cottrell, D.L. Kirchman, **K. Kaiser**, P. M. Medeiros, L. Tremblay, N. Batailler, J. Caparros, P. Catala, K. Escoubeyrou, L. Oriol, S. Blain, and I. Obernosterer (2014). Phylogenetic and structural response of heterotrophic bacteria to dissolved organic matter of different chemical composition in a continuous culture study. *Environ. Microbiol.*, DOI: 10.1111/1462-2920.12242.
- 28) Y Zhang, **K Kaiser**, L Li, D Zhang, Y Ran, R Benner (2013). Sources, distributions, and early diagenesis of sedimentary organic matter in the Pearl River region of the South China Sea, *Mar. Chem.* 158, 39-48. <http://dx.doi.org/10.1016/j.marchem.2013.11.003>
- 27) Fichot, C.G, **Kaiser, K.**, Hooker, S.B., Amon, R., Babin, M., Belanger, S. Walker, S.A, and R. Benner (2013). Pan-Arctic distributions of continental runoff in the Arctic Ocean. *Nature Sci. Rep.* 3:1053, 1-6. doi: 10.1038/srep01053.
- 26) Peter, S., Shen, Y., **Kaiser, K.**, Benner, R., and E. Kaiser (2013). Variability in the bioavailability and diagenetic state of dissolved organic matter in riparian groundwater. *JGR-Biogeosciences* 117. doi: 10.1029/2012JG002072.
- 25) Flerus, R., Koch, B. P., Lechtenfeld, O. J., McCallister, S. L., Schmitt-Kopplin, P., Benner, R., **Kaiser, K.** and G. Kattner (2012). Ageing of marine dissolved organic matter: a molecular perspective. *Biogeosciences*, 6, 1935-1955. doi: 10.5194/bg-9-1935-2012
- 24) Huang, Q., **Kaiser, K.**, and R. Benner (2012). A simple HPLC method for the measurement of nucleobases and the RNA and DNA content of cellular material. *Limnol. Oceanogr. –Methods*, 10, 608-616. doi: 10.4319/lom.2012.10.608.
- 23) Thomas, L. K, Widdowson, M.A., Novak J.T., Chapelle F.H., Benner R., and **K. Kaiser** (2012). Potentially bioavailable natural organic carbon and hydrolyzable amino acids in aquifer sediments. *Groundwater Mont. Rem.*, 4, 92-95, doi: 10.1111/j.1745-6592.2012.01406.x.
- 22) **Kaiser, K** and R. Benner (2012). Characterization of lignin by gas chromatography and mass spectrometry using a simplified CuO oxidation method. *Anal. Chem.*, **84**, 459-464.
- 21) **Kaiser, K** and R. Benner (2012). Organic matter transformations in the upper mesopelagic zone of the North Pacific: chemical composition and linkage to microbial community structure. *J. Geophys. Res. – Oceans*, 117, C01023, doi: 10.1029/2011JC007141.
- 20) Chapelle, F. H., Bradley, P., McMahon, P. B., **Kaiser, K.**, and R. Benner (2012). Dissolved oxygen as an indicator of bioavailable dissolved organic carbon in ground water, *Groundwater*, 50, 230-241.
- 19) Benner, R, and **K. Kaiser** (2011). Biological and photochemical transformations of amino acids and lignin phenols in riverine dissolved organic matter, *Biogeochem.*, doi: 10.1007/s10533-010-9435-4.
- 18) **Kaiser, K.** and R. Benner (2009). Biochemical composition and size distribution of organic matter at the Pacific and Atlantic Time-Series Stations. *Mar. Chem.*, **113**, 63-77.
- 17) Davis, J., **Kaiser, K.**, and R. Benner (2009). Amino acid and amino sugar yields and compositions as indicators of dissolved organic matter diagenesis. *Org. Geochem.*, **43**, 343-352.
- 16) Chapelle, F. H., Bradley, P. M., Goode, D. J., Tiedeman, C., Lacombe, P. J., **Kaiser, K.**, and R.

- Benner (2009). Biochemical indicators for the bioavailability of natural dissolved organic carbon in ground water. *Groundwater*, **47**, 108-121.
- 15) **Kaiser, K.** and R. Benner (2008). Major bacterial contributions to the ocean reservoirs of detrital organic carbon and nitrogen. *Limnol. Oceanogr.* **53**, 99-112.
- 14) Hertkorn, N., Benner R., Frommberger M., Schmitt-Kopplin P., Witt M., **Kaiser K.**, Kettrup A., and J. I. Hedges (2007). An integrated NMR and FT-CIR mass spectroscopic study to characterize a new and major refractory component of (marine) natural organic matter (NOM) at the molecular level, CRAM: Carboxyl-rich alicyclic molecules. *Geochim. Cosmochim. Acta* **71**, A399-A399.
- 13) Hertkorn, N., Benner R., Frommberger M., Schmitt-Kopplin P., Witt M., **Kaiser K.**, Kettrup A., and J. I. Hedges (2006). Characterization of a major refractory component of marine dissolved organic matter. *Geochim. Cosmochim. Acta* **70**, 2990-3010.
- 12) Maie, N., Parish, K. J., Watanabe, A., Knicker, H., Benner, R., Abe, T., **Kaiser, K.**, and R. Jaffe (2006). Chemical characteristics of dissolved organic nitrogen in an oligotrophic subtropical coastal ecosystem. *Geochim. Cosmochim. Acta* **70**, 4491-4506.
- 11) **Kaiser, K.**, and R. Benner (2005). Hydrolysis-induced racemization of amino acids. *Limnol. Oceanogr.-Methods*, **3**, 318-325.
- 10) Ebner, A., Marek, M., **Kaiser, K.**, Kada, G., Hahn, C. D., Lackner, B., and H. J. Gruber (2005). Application of Biotin-4-Fluorescein in homogenous fluorescence assays for avidin, streptavidin and biotin or biotin derivatives. In *Avidin-Biotin Technology in Life Sciences*, ed. R. McMahon, Totowa (N.J.), Humana Press.
- 9) Benner, R., Benitez-Nelson, B., **Kaiser, K.**, and R. M. W. Amon (2004). Export of young terrigenous dissolved organic carbon from rivers to the Arctic Ocean. *Geophys. Res. Lett.* **31**, doi:10.1029/2003GL019251.
- 8) Benner, R., and **K. Kaiser** (2003) Abundance of amino sugars and peptidoglycan in marine particulate and dissolved organic matter. *Limnol. Oceanogr.* **48** (1), 118-128.
- 7) Ogawa, H., Amagai, Y., Koike, I., **Kaiser, K.**, and R. Benner (2001). Production of refractory dissolved organic matter by bacteria. *Science* **292**, 917-920.
- 6) **Kaiser, K.**, and R. Benner (2000) Determination of amino sugars in environmental samples with high salt content by high-performance anion-exchange chromatography and pulsed amperometric detection. *Anal. Chem.* **72**, 2566-2572.
- 5) Kada, G., **Kaiser, K.**, Falk, H., and H. J. Gruber (1999). Rapid estimation of avidin and streptavidin by fluorescence quenching or fluorescence polarization. *Biochim. Biophys. Acta-General Subjects* **1427**, 44-48.
- 4) Gruber, H.J., Kada, G., Marek, M., and **K. Kaiser** (1998). Accurate titration of avidin and streptavidin with biotin-fluorophore conjugates in complex, colored biofluids. *Biochim. Biophys. Acta -General Subjects* **1381**, 203-212.
- 3) Gruber, H.J., Marek, M., Schindler, H., and **K. Kaiser** (1997). Biotin-fluorophore conjugates with poly(ethylene glycol) spacers retain intense fluorescence after binding to avidin and streptavidin. *Bioconjug. Chem.* **8**, 552-559.
- 2) Marek, M, **Kaiser, K.**, and H. J. Gruber (1997) Biotin-pyrene conjugates with poly(ethylene glycol) spacers are convenient fluorescent probes for avidin and streptavidin. *Bioconjug. Chem.* **8**, 560-566.
- 1) **Kaiser, K.**, Marek, M., Haselgruebler, T., Schindler, H., and H. J. Gruber (1997). Basic studies on heterobifunctional biotin-PEG conjugates with a 3-(4-pyridyldithio)propionyl marker on the second terminus. *Bioconjug. Chem.* **8**, 545-551.

Grant awards at TAMU Galveston

2012-2017 (6 years): \$1,011,969

2018-2024: \$2,871,116

Total: \$3,882,571 (90% external funding)

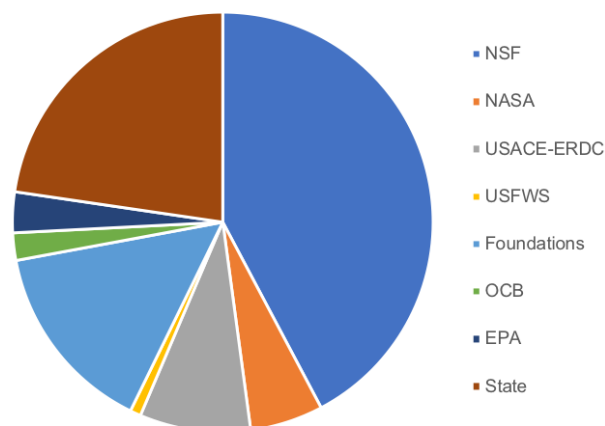


Fig. 1: Distribution of funding sources from 2012-2024. The majority of funding was from external sources with NSF being the largest providing 42% of overall funding. Other federal funding agencies include NASA, the Army Corp of Engineers (USACE-ERDC), US Fish and Wildlife Service (USFWS), and EPA. OCB is the Ocean and Carbon Biogeochemistry Program. Foundations include the Matagorda Bay Mitigation Trust and the International Humic Substance Society.

Cruise/Field Experience

2024: Mackenzie River, NWT, May-June 2024

2023: Mackenzie River, NWT, May-June 2023

North Atlantic, RV Atlantic Explorer, April and June 2023

2022: Mackenzie River, September 2022

2022: North Atlantic, RV Atlantic Explorer December 2022

2020-2022: Matagorda Bay, TX, quarterly trips

2019: Nam Theun, Laos, December 2019

2018: New Finland, Canada, September 2018

2017: Labrador Peninsula, Canada, June 2017

2016: San Francisco Bay Estuary, June 2016

2015: San Francisco Bay Estuary, June 2015

2014: San Francisco Bay Estuary, December 2014

2008: Nansen and Admunsen Basins—Arctic Ocean. *Kapitan Dranitsyn*, Oct. 2008.

Isolation of lignin biomarkers, fluorescence measurement.

2004: Bering Sea – Chukchi Sea. *USCGS Healy*, July-August 2004. DOM isolation, fluorescence measurements, Sediment coring.

2002: Bering Sea – Chukchi Sea. *USCGS Healy*, July-August 2002. DOM isolation, Fluorescence measurements, Sediment coring.

2000: Gulf of Mexico Transect. *RV Longhorn*, May 2000 Cocatrice, LA. DOM isolation and tangential ultrafiltration. Respiration measurements.

2001: BATS (Bermuda Area Time Series). *RV Cape Hatteras*, June 2001. DOC isolation and ultrafiltration, POC collection, ancillary measurements.

1999: North Pacific. *RV Kai' ma' kai O' Kanaloa*, November 1999. DOM isolation and tangential ultrafiltration.

Research Analytical Techniques

- Implementation of GLP and GMP practices in an environmental laboratory.
- Extensive experience with molecular-level analyses of carbohydrates (GC-MS, LC-PAD). Expertise in chiral separation of amino acids (LC, GC-IRMS). Analysis of lignin in natural organic matter and peats (LC-MS, GC-MS, GC-IRMS).

- Hands on experience with $^1\text{H}/^{13}\text{C}/^{15}\text{N}$ -NMR, high-resolution mass spectroscopy (FTICR-MS), fluorescence, UV, IR, Atomic Force Microscopy (AFM), hyphenated ICP-MS applications.
- Extensive experience in chromatography methods (HPLC, HPLC-MS, GC, GC-MS, ion exchange, gelfiltration, affinity chromatography, reversed phase chromatography, PAGE, capillary electrophoresis) and electroanalytical methods (polarography, potentiometry).
- Skilled in organic synthesis (carbohydrates, peptides, bifunctional PEG crosslinkers for Avidin–Biotin assays).
- Experience in protein purification from biofluids.
- Experience in polymer technology and ceramics technology. Design of an apparatus to measure resistivities of $\text{ZrO}_2\cdot\text{Y}_2\text{O}_3$ ceramics.
- Miscellaneous laboratory and field techniques, including organic carbon analysis (high temperature combustion), total and organic nitrogen analysis (high temperature combustion, chemiluminescence), phosphate analysis, ultrafiltration, respiration measurements, collection of marine samples, net tows, sediment coring.

Recent Presentations at Professional Meetings

2024:

Miller, K., Hala, D., Rooker, J. R., Wells, R. D., Gahn, M. B., & Kaiser, K. (n.d.). Micro-and nanoplastics in muscle tissue of top predators of the ocean. In 2024 Ocean Sciences Meeting.

Kaiser, K., Fichot, C. G., Weiser, M. W., & Yan, G. (n.d.). Production and removal mechanisms of refractory dissolved organic matter in coastal and marine environments. In 2024 Ocean Sciences Meeting.

Wharton, M., Gahn, M. B., Hala, D., Du, J., Park, K., & Kaiser, K. (n.d.). Quantifying Microplastic Contamination in Galveston Bay and the Gulf of Mexico watershed. In 2024 Ocean Sciences Meeting.

Harringmeyer, J. P., Kaiser, K., Yan, G., Weiser, M. W., Zhu, X., Ghosh, N., & Fichot, C. G. (n.d.). Using Optical Indicators and Lignin Biomarkers to Distinguish Marine, Riverine, and Marsh Derived Dissolved Organic Matter in the Northern Gulf of Mexico. In 2024 Ocean Sciences Meeting.

2023:

Burns, A., Spencer, R. G., Kellerman, A., Yan, G., Leonard, L., Kaiser, K., et al. (n.d.). Intimate Terrestrial-Aquatic Linkages Drive Dissolved Organic Carbon Compositional Variability in the Yukon River Delta Across Seasonal and Spatial Scales. In AGU Fall Meeting Abstracts (Vol. 2023, pp. B11F-1859).

Summers, E. J., Du, J., Park, K., & Kaiser, K. (n.d.). Modelling the Retention of Microplastics in Gulf of Mexico Estuaries. In AGU Fall Meeting Abstracts (Vol. 2023, pp. GC53J-0932).

Summers, E., Du, J., Park, K., Kaiser, K., & Ryder, J. (n.d.). Modelling transport pathways of varying microplastics in an estuarine environment. In EGU General Assembly Conference Abstracts (p. EGU-9577).

Ziegler, S. E., Myers-Pigg, A., & Kaiser, K. (n.d.). Seasonality in Dissolved Organic Matter (DOM) Composition Indicates Climate-warming Enhanced Mobilization of Soil DOM Through Hydrology Driven Microbial Controls in Mesic Boreal Forests. In AGU Fall Meeting Abstracts (Vol. 2023, pp. B23H-2175).

2022:

Co-chair, virtual AGU Ocean Sciences – Session: Going to the extreme: Biogeochemical responses of coastal ecosystems to storms and fires

2021:

Co-chair, virtual ASLO Meeting – Session: Carbon fluxes in a changing Arctic across physical, chemical and microbial scales

Leonard, Laura, Amon, Rainer, Benner, Ronald, **Kaiser, Karl**

CuO oxidation-derived molecules as tracers of dissolved organic matter sources and transformations in the Arctic Ocean
ASLO Meeting 2021

Joshua P Harringmeyer, **Karl Kaiser**, David R Thompson, Michelle M Gierach, Curtis L Cash, Cedric G Fichot
Detection and Sourcing of Chromophoric Dissolved Organic Matter (CDOM) in Urban Coastal Waters with UV-Visible Imaging Spectroscopy
AGU Fall Meeting 2021

Ge Yan, **Karl Kaiser** (2021), Hurricanes accelerate carbon cycling in coastal ecosystems,
OCB-NACP workshop March 2021

2020:

Co-chair, AGU Ocean Sciences – San Diego, Session: Water quality monitoring and forecasting in coastal and inland waters: Biogeochemistry of urban systems.

Tatiana Williford, Rainer MW Amon, Ronald H Benner, Karl Kaiser, Dorothea Bauch, Colin A Stedmon, Sally Annette Walker, Michiel Rutgers van der Loeff, Maarten Klunder, Ge Yan, Insights into the origins, molecular characteristics and distribution of iron-binding ligands in the Arctic Ocean, AGU Fall Meeting 2020.

Zakhar Kazmiruk, Ge Yan, Karl Kaiser , Investigating the Sources and Transformations of Dissolved Organic Carbon in a Heavily Urbanized Coastal Watershed Following a Hurricane-induced Extreme Flood Event, AGU Fall Meeting 2020.

Alan Roebuck, Allison Myers-Pigg, Karl Kaiser, Karen L Presteggaard, Susan E Ziegler , Climate Related Shifts in Hydrology Can Impact Source and Delivery of Terrestrial Dissolved Organic Matter to Aquatic Systems in a Mesic Boreal Forest Watershed, AGU Fall Meeting 2020

Chia-Ying Chuang, Francois Guillemette, Jennifer Harfmann, Karl Kaiser, Robert Spencer, Brian Bergamaschi, Peter Hernes , Parsing the DOM sources using calibrated biomarkers in the San Francisco Bay Estuary, EGU General Assembly Conference 2020.

Peter J Hernes, Chia-ying Chuang, Jennifer Harfmann, Francois Guillemette, Robert G Spencer, Brian A Bergamaschi, Karl Kaiser , Organic Matter Transformations During Transit Through the San Francisco Bay Estuary, Ocean Sciences Meeting 2020

Laura Leonard, Cedric G Fichot, Ronald H Benner, Karl Kaiser, Tracking cupric oxide-derived compounds across high and low latitude oceans, Ocean Sciences Meeting 2020

Stephanie Mohan, Rainer MW Amon, Suzanne Tenison, Gari Zinsmeyer, Brittney Daniels, Anthony Todd, Karl Kaiser, Sharon Z Herzka, and Juan Carlos Herguera , Characterization of dissolved organic matter in the Southern Gulf of Mexico, Ocean Sciences Meeting 2020

Matthew Weiser, Karl Kaiser, Cedric G Fichot Concentrations and Reactivities of Refractory Carboxyl-rich Alicyclic Molecules (CRAM) in Contrasting Natural Waters, Ocean Sciences Meeting 2020

Joshua P Harrington, Karl Kaiser, David R Thompson, Michelle M Gierach, Curtis L Cash, Cedric G Fichot , Can imaging spectroscopy facilitate the detection of wastewater effluent in coastal waters? Ocean Sciences Meeting 2020

Cedric G Fichot, Kunpeng Sun, Karl Kaiser, Curtis L Cash, An improved fluorescence-based tracer of wastewater effluent for use in urban coastal waters, Ocean Sciences Meeting 2020

Karl Kaiser, Jessica Labonté, Antonietta Quigg, Ge Yan , Extreme weather events accelerate carbon cycling in coastal ecosystems, Ocean Sciences Meeting 2020

2019:

Co-chair, ASLO 2019 – Puerto Rico, Session: Exploring microbial interactions and organic matter transformations within oxygen minimum zones

Kaiser, K, Abulla, H., Walker, B, Dynamic cycling of dissolved organic matter in oxygen minimum zones revealed by spectroscopic and molecular-level analyses. ASLO, Puerto Rico, February 2019

Steichen, J.L., Windham, R., Hala, D., Kaiser, K., Labonté, J. M., Bacosa, H., Kamalanathan, M., Setta, S. and Quigg, A., Changes in the microbial community of Galveston Bay following an extreme flooding event in the wake of Hurricane Harvey, ASLO, Puerto Rico, February 2019.

2018:

Kaiser, K, R. Benner, R. Amon, Pan-Arctic distribution and reactivity of terrigenous dissolved organic carbon in Arctic watersheds and the Arctic Ocean. AGU Ocean Sciences, February 2018.

Yan, G, Kaiser, K. Application of a Novel Ultra-Low-Volume Lignin Analysis Method to Study the Removal and Transport of Terrigenous Dissolved Organic Carbon in the Arctic Ocean, AGU Ocean Sciences 2018.

2017:

Kaiser, K., Amon, R., and R. Benner. The fate of terrigenous dissolved organic carbon on the Eurasian shelves and export to the North Atlantic, European Geoscience Union Meeting, April 2017.

Molodtsova, T., Amon, R., Kaiser, K., Walker, S., Stedmon, C. Relationships between dissolved organic matter, hydrography, and trace elements in the Eurasian Arctic Ocean. ASLO Spring Meeting, February 2017.

Fichot, C.G., Trinh, R., Kaiser, K Smith, J., Gierach, M.M., Holt, Cash C., Impacts of a wastewater diversion event on the water quality of Santa Monica Bay, California. International Ocean Colour Science Meeting 2017, Lisbon.

Myers-Pigg, A., K Kaiser, RH Benner, SE Ziegler, Drivers of lignin composition in boreal forest organic soils across a climate gradient, AGU December 2017

Von Ness, K, J Loisel, DW Beilman, K Kaiser, A Holocene History of Permafrost Dynamics, Carbon Sequestration, and Hydrological Changes at Beretta Bog, Mackenzie River Basin, AGU December 2017

2016:

Kaiser, K., Amon, R., and R. Benner. The fate of terrestrial dissolved organic matter in the Eurasian basin of the Arctic Ocean, AGU Ocean Sciences, Feb 2016.

(*) Canedo, M., Kaiser, K. Application of biomarkers to examine transformations of dissolved carbon and nitrogen reservoirs in Arctic rivers, AGU Ocean Sciences, Feb 2016

(*) Creeley, D, Kaiser, K. The fate of terrestrial dissolved organic matter in ocean margins investigated through coupled microbial-photochemical incubations of vascular plant leachates, AGU Ocean Sciences, Feb 2016.

2015:

Patrick Louchouart, Matt Norwood, Amanda Sterne, Karl Kaiser, A. Armitage, W. Highfield, and S. Brody. Measuring the Role of Ecological Structure and Environmental Change on Organic Carbon Preservation in Coastal Wetlands from the Texas Gulf Coast. AGU-GAC Joint Assembly Meeting.

(*) Amanda Sterne¹, Karl Kaiser¹, Patrick Louchouart^{1,2}, Matt Norwood. Degradation State and Sequestration Potential of Carbon in Coastal Wetlands of Texas: Mangrove Vs. Saltmarsh Ecosystems. AGU San Francisco, Fall 2015

2014:

Kaiser, K., Amon, R., and R. Benner. (oral). Chemical characteristics and decomposition of dissolved organic matter (DOM) in the Eurasian Basin of the Arctic Ocean, AGU Meeting, Honolulu, Feb 2014

(*) McMahan, R. and K. Kaiser (poster), Application of carbohydrates as biomarkers to study dissolved organic matter reservoirs in Arctic rivers, AGU Meeting, Honolulu, Feb 2014.

(*) Wyers, A. J.; (*) Ransom, J. L.; Kaiser, K.(poster): Linking chemical composition and molecular structure of terrigenous organic matter to optical properties, AGU Meeting, Honolulu, Feb 2014.

(*) Ransom, J. L.; (*) Wyers, A. J.; Kaiser, K.(poster): Investigating the sources and decomposition of terrigenous organic matter using biomarkers. AGU Meeting, Honolulu, Feb 2014.

Loisel, J., Yu, Z., Beilman, D., and K. Kaiser (poster), Developmental history of an intriguing peat-forming community along the West Antarctic Peninsula, AGU Meeting, San Francisco, December 2014.

Loisel, J., Yu, Z., Beilman, D., and K. Kaiser (oral), Biochemical and Geochemical Analysis of an Antarctic Peatland, GSA, Vancouver 2014.

(*)Sterne, A., Louchouart, P., Norwood, M., and K. Kaiser (poster), Controls of Carbon Preservation in Coastal Wetlands of Texas: Mangrove vs. Saltmarsh Ecosystems, GU Meeting, San Francisco, December 2014

2013:

Kaiser, K., Philben, M., and R. Benner (poster). Investigating carbon dynamics in Siberian peat bogs using molecular-level analyses. AGU Meeting, San Francisco.

2012:

Kaiser, K., and R. Benner (invited talk). Carbohydrates, lignin and p-hydroxy-acetophenone (PON) as quantitative molecular vegetation proxies in peats. AGU Meeting, San Francisco.

2011:

Kaiser, K., and R. Benner (invited talk). Sources and transformations of non-living organic matter in the oceans. International Symposium on Advanced Studies on Environmental Pollution and Ecotoxicology, Ehime, Japan.

2010:

Kaiser, K. (invited talk). Sources and biochemical composition of detrital organic matter in the sea. DISCO symposium, Honolulu.

2010:

Kaiser, K., and R. Benner (poster). Major contribution of carbohydrates and amino acids to reactive organic matter in the upper mesopelagic zone of the subtropical North Pacific gyre. Ocean Sciences Meeting, Portland.

2009:

Kaiser, K., and R. Benner (poster). Investigating the sources and transformations of detrital marine organic matter using bacterial biomarkers. Chemical Oceanography in a Changing World, Savannah.

2008:

Kaiser, K., and R. Benner (talk). Major bacterial contribution to the ocean reservoirs of detrital organic carbon and nitrogen. Ocean Sciences Meeting, Orlando, FL.

2007:

Kaiser, K., and R. Benner (talk). The chemical composition of semilabile organic matter in the open ocean. American Society of Limnology and Oceanography Santa Fe, NM.

2006:

Kaiser, K., and R. Benner (poster). Comparison of the molecular composition of marine organic matter from the Sargasso Sea and North Pacific. Ocean Sciences Meeting Honolulu.

2005:

Kaiser, K., and R. Benner (invited talk). Bacterial contribution to marine organic matter. American Society of Limnology and Oceanography, Santiago de Compostela, Spain.

(*) graduate/undergraduate student

Graduate Students, and Postdoctoral Advisees:

Assistant Research Scientist : Ge Yan 2022 - present

Postdoctoral Associate: Ge Yan 2015 – 2019

PhD:

Marcus Wharton 2021 – present

Hope Vanderhider 2020 - present

Laura Leonhard 2018 – present

MS:

Russell Cole 2020 - present
Bianca Broman 2018 – 2019
Amanda Sterne 2016 – 2018
Maria Canedo 2013 – 2016
Danielle Creeley 2013 – 2017

Additional Graduate Students Mentoring:

PhD: David Minkoff (Boston University, main advisor: Jelle Atema) 2015 – 2020
Matthew Weiser (Boston University, main advisor: Cedric Fichot) 2020 – present

MS: Markus Welker (Dartmouth College, advisor: Ann Kapucinski) 2012-2015

Thesis/dissertation committee: serving or served as a member on >20 committees

Undergraduate Students Advised in the Laboratory (total = 25)

Undergraduate Research Scholars with thesis: Laura Leonhard (2018) - Texas Sea Grant fellowship
Jesus Duran (2017) – Texas Sea Grant fellowship
Amanda Sterne (2015)
Rachel McMahon (2014) – Texas Sea Grant fellowship
Marcus Wharton (2020) – Texas Sea Grant fellowship
Brian Wharton (2021) – Texas Sea Grant fellowship

NSF REU student: Katherine Rivera Perez (2017), Alexis Grabast (2018)

Undergraduate research projects: Jesus Duran, Amanda Self, Chris Litwin, Chris Schneider, Melinda May, Jackson Wyers, Jacob Ransom, Jonathan Hoag, Isaac Johnston, Maria Canedo, John White, Shelli McGowen, Michael Gahn, Elizabeth Thomas, Marcus Wharton, Brianne Wharton, Victoria Caballero, Nicole Patterson, Caitlyn Gouthier.

Reviewer Activities

Associate Editor: Marine Chemistry

NSF Panelist

Journals: Proceeding of the National Academy of Sciences, Nature Geoscience, Marine Chemistry, Limnology and Oceanography, Journal of Oceanography, Environmental Science and Technology, Organic Geochemistry, Deep Sea Research II, Geochimica et Cosmochimica Acta, Analytical Chemistry.

Funding agencies: NSF OCE and EAR programs, Maryland Seagrant, Wisconsin Seagrant, Texas Seagrant, New York Seagrant, NSERC, DFG, ANR.

Collaborators:

Abdulla, Hussain	Texas A&M Corpus Christi
Amon, Rainer	Texas A&M University at Galveston
Ardren, Bill	US Fish & Wildlife, Vermont
Atema, Jelle	Boston University
Beilman, David	University of Hawaii, Hawaii
Benner, Ronald	University of South Carolina (PhD advisor)
Billings, Sharon	University of Kansas
Correa, Adrienne	Rice University
Fichot, Cedric	Boston University
Friedl, Mark	Boston University
Frolking, Steve	University of New Hampshire
Gruber, Herman	Johannes Kepler University (Linz, Austria)
Hala, David	Texas A&M
Hernes, Peter	University of California, Davis
Hertkorn, Norbert	GSF Research Center for Environment and Health (Germany)
Janout, Markus	AWI Bremerhaven
Labonte, Jessica	Texas A&M

Lechtenfeld, Oliver	Helmholtz Centre for Environmental Research GmbH – UFZ (Leipzig, Germany)
Loisel, Julie	Texas A&M University
Louchouart, Patrick	Texas A&M University at Galveston
Ogawa, Hiroshi	University of Tokyo
Spencer, Robert	Florida State University
Shiklomanov, Alex	University of New Hampshire
Taylor, Brad	Dartmouth College
Walker, Brett	University of California, Irvine
Yu, Zicheng	Lehigh University, Pennsylvania
Ziegler, Susan	Memorial University, Canada

Professional Memberships

American Geophysical Union (AGU)
Association for the Sciences of Limnology and Oceanography (ASLO)
European Geoscience Union (EGU)
American Chemical Society (ACS)