**CURRICULUM VITAE**

**MARCO J.L. COOLEN**

Geo(paleo)microbiologist Tel: 1-508-289-2931

Associate Scientist Fax: 1-508-457-2164

Woods Hole Oceanographic Institution E-mail: mcoolen@whoi.edu

Marine Chemistry & Geochemistry Dept. Site: http://www.whoi.edu/people/mcoolen/index.html

Woods Hole Oceanographic Institution

360 Woods Hole Rd. MS#4, Woods Hole, MA 02543

**EDUCATION:**

Ph.D. Molecular Microbial Ecology, Institute for the Chemistry and Biology of the Marine Environment (ICBM), University of Oldenburg, Germany, 2001, *Analysis of extant and subfossil microbial communities in Holocene and Pleistocene Aquatic Sediments* (advisors: Prof. Dr. J. Overmann and Prof. Dr. H.-J. Brumsack).

M.Sc. Cellular Biology and Microbial Ecology, University of Wageningen, NL., 1996.

B.Sc. Microbiology, International Agricultural College Larenstein, Wageningen, NL., 1992.

**PROFESSIONAL EXPERIENCE:**

* Associate Scientist, Woods Hole Oceanographic Institution, MA, USA, Since May 2009.
* Assistant Scientist, Woods Hole Oceanographic Institution, MA, USA, Since May 2005.

##### Postdoctoral Investigator, Royal Netherlands Institute for Sea Research (Royal NIOZ), Department of Marine Biogeochemistry and Toxicology, the Netherlands, August 2000 to May 2005.

##### Postdoctoral Investigator, Center for Ecological and Evolutionary Studies, University of Groningen, the Netherlands, Nov. 1999 to August 2000.

**PROFESSIONAL AFFILIATIONS**

* Review editor of Frontiers in Extreme Microbiology
* Member, American Geological Union, 2005 to present
* Member, European Geological Union, 2001-2005.
* Member, Vereinigung für Allgemeine und Angewandte Mikrobiologie (VAAM), 1996-2000.

**RESEARCH INTERESTS:**

* Bioavailability and fate of organic matter in ancient aquatic sediments and permafrost soils, which are of importance for our understanding of past climates and of the contemporary carbon cycle.
* Fate of nucleic acids in Glacial to Holocene marine and lacustrine sediments.
* Development and application of advanced molecular tools to analyze ancient plankton DNA signatures in sediment records (i.e., *fossil* DNA).
* The use of multiproxy paleoceanography: *fossil* DNA, transcriptomics, (isotopic) lipid geochemistry, and microfossils (collaboration) to reconstruct the diversity, and biogeochemical role of past marine and lacustrine planktonic communities which, in turn, provides information about past ecological and environmental changes from climate variability or other perturbations.
* Impact of past and present environmental changes (e.g., ocean acidification) on microbial ecology/genetics and biogeochemical cycling.

**SYNERGISITIC ACTIVITIES:**

* Organizer of mini-symposium “A selection of microbiological studies at WHOI and Wageningen University, the Netherlands”, April 16, 2009. Redfield Auditorium, WHOI, Woods Hole, MA.
* Serving on the Institute Advisory Committee (IAC) for the Ocean Life Institute (OLI)
* OLI-fellow 2008-2011
* Session convener, Paleoceanography and Paleoclimatology Program of the AGU Fall 2007 meeting.
* Reviewer of NSF proposals, Environmental Microbiology, Organic Geochemistry, Molecular Ecology, Limnology and Oceanography, Journal of Plankton Research, ISME Journal, Earth and Planetary Sciences.

**AWARDS:**

* WHOI’s Ocean Life Institute Fellow (2008-2011). Two fellows are selected annually.
* Netherlands Res. Council-Earth Life Sci. (NWO-ALW) Innovative Research “VENI” Award, 2004.

**PENDING RESEARCH PROPOSALS (location of research: WHOI).**

**Coolen, M.J.L.**, M. Edlund. *Collaborative Research: A paleogenetics approach to understand the history and dynamics of harmful cyanobacterial blooms and associated plankton in Lake Erie.* Submitted to NSF-Biological Oceanography (total request 750 k$; 490 k$ for MJLC).

Wang, Z., and **M.J.L. Coolen.** *Does ocean acidification cause evolutionary adaptation in marine nitrogen fixers?* Submitted to The Gordon and Betty Moore Foundation’s Marine Microbiology Initiative.

Edgcomb, V.P., G. Taylor, M. Johnson, S. Hallam, J. Bernhard, C. Taylor, **M.J.L. Coolen**, K. Casciotti, W. Betancourt, S. Wihelm. *Impact of changing trophic interactions on C and N cycling in graded oxygen-depleted marine environments.* Submitted to The Gordon and Betty Moore Foundation’s Marine Microbiology Initiative.

# FUNDED RESEARCH GRANTS, AWARDS, and MONETARY GIFTS (location of research: WHOI).

Bidle K, B.A.S. Van Mooy, **M.J.L. Coolen**, A. Vardi, G.R. DiTullio. *Lipid lubrication of oceanic carbon and sulfur biogeochemistry via a host-virus chemical arms race.* Funding agency: NSF-Biological oceanography (NSF award number not yet provided; **200 k$ for MJLC out of 1.05 M$**; 2011-2014).

**Coolen, M.J.L.**, and N. Drenzek, *Toward microbially-enhanced shale gas production*. Funding source: N. Drenzek (collaborating PI), Schlumberger-Doll-Research (**300 k$**; 2010-2012).

**Coolen, M.J.L**. *A pyrosequencing approach to study Quaternary vegetation shifts as a response to climate change.* Funding agency: WHOI’s Independent Studies Mellon award (**63 k$**; 2009-2011).

**Coolen, M.J.L.** *Reconstruction of natural vs. anthropogenic causes of past harmful algal blooms and associated plankton in Chesapeake Bay using ancient DNA stratigraphy.* Funding agency: WHOI’s Access to the Sea award. (**38 k$**; 2009-2011).

**Coolen, M.J.L.** Identification of riverine and indigenous permafrost microbiota (eukarya, archaea, bacteria) involved in the (an)aerobic degradation of ancient organic matter stored in thawing permafrost. Funding agency: WHOI’s Arctic Research Initiative. (**48 k$**; 2009-2011).

**Coolen M.J.L.**, and T. I. Eglinton. An evaluation of postdepositional controls on the preservation of DNA in marine sediments. Funding agency: NSF-Chemical Oceanography (NSF award # 0825020; **592 k$**; 2008-2011).

**Coolen M.J.L.** *454 tag sequencing of rRNA genes from extant and Holocene Black Sea microbiota.* Funding agency: IcoMM Call for Participating: Unveiling the Ocean’s Hidden Majority through 454 Tag Sequencing (**15 k$**; 2008).

**Coolen, M.J.L.** *454 pyrotag sequencing of rRNA genes and transcripts to reveal the complete diversity and relative abundance of Holocene and active microbiota in the Black Sea*. Funding agency: WHOI’s Independent Studies Mellon award (**50 k$**; 2007-2009).

**Coolen, M.J.L.** *Is permafrost as a result of global warming a possible significant source of degradable organic matter for microbiota residing in situ and in Arctic rivers?* Funding agency: WHOI’s Arctic Research Initiative (**97 k$**; 2007-2009 and **27k$** through 2010).

**Coolen, M.J.L**. and T.I. Eglinton. *Exploration of fossil DNA-based geobiologic archives to reconstruct hydrologic changes in the Black Sea during the Holocene*. Funding agency: NSF-Ocean Sciences-Marine Geology and Geophysics (NSF award # 0602423; **533 k$**; 2006-2009).

**Coolen, M.J.L.** *Diversity and quantity of metabolically active microbial communities within the stratified Black Sea: Do these organisms form genetic archives for paleoclimate reconstructions?* Funding agency: WHOI’s “Access to the Sea” Award (**40 k$**; 2006-2008).

**Coolen, M.J.L.** *A combined lipid and nucleic acids based stratigraphic analysis of ancient and metabolically active microbial communities in Quaternary eastern Mediterranean sapropels.* Funding agency: WHOI ‘2005 Independent Studies Mellon Award (**49 k$**; 2007-2009).

**Coolen, M.J.L.** Exploration of fossil DNA as a novel tool to reconstruct past microbial diversity and climate-change in the tropics. Funding agency: WHOI’s Tropical Life Institute Award (**75 k$**; 2005-2007).

# FUNDED RESEARCH GRANTS AND AWARDS (location of research: Royal NIOZ):

**Coolen, M.J.L.** *Environmental controls on ancient microbial diversity and metabolic processes as revealed by stratigraphic analysis of fossil and extant functional genes.* Funding agency: NWO-ALW “VENI program, Innovational Research Incentives Award”. (award # 863.04.020 ; 240 k$; 2005-2008.

**Coolen, M.J.L.**, Sinninghe Damsté, J.S., Schouten S. *Fossil DNA as recorder of global change and ancient biodiversity in Quaternary marine settings.* Funding agency: NWO-ALW “Open Competition” award # 813.13.001; **295 k$**; 2005-2008.

**Coolen, M.J.L**., Sinninghe Damsté, J.S., Schouten S. *Environmental controls on present and past microbial diversity as revealed by extant and fossil DNA from Antarctic Ace Lake and Ellis Fjord.* Funding agency: NWO-ALW “Netherlands Polar Program” (award # 851.20.020; **145 k$**; 2004-2006.

##### COLLABORATORS WITHIN THE PAST 48 MONTHS

**USA**: Aleck Wang, Liviu Giosan, Cabel Davis, Ben Van Mooy (WHOI); Stuart Wakeham (Skidaway Inst. of Oceanography); Yongsong Huang (Brown University); Mark Edlund (St. Croix Watershed Research Station); Kay Bidle and Asaf Vardi (Rutgers University); Giacomo R. DiTullio (College of Charleston); Brook Nunn (University of Washington); Hailiang Dong (Miami University); Nick Drenzek (Schlumberger-Doll-Research); Cornelia Wuchter (Contractor for Schlumberger project).

**Netherlands**: Jaap.S. Sinninghe Damsté, Stefan Schouten, Gerard Herndl, Marcel Veldhuis (NIOZ); Gerard Muyzer (University of Delft); Gert de Lange, Henk Brinkhuis, and Francesca Sangiorgi (University of Utrecht); Marc Strous (Radboud University Nijmegen); Jack J. Middelburg (NIOO-KNAW).

**Bulgaria**: Galina Shtereva; Petko Dimitar (Institute of Oceanology, Bulgarian Academy of Sciences); Mariana Filipova (Natural History Museum, Varna).

**Germany**: Joerg Overmann (University of Munich); Marcel M.M. Kuypers, Lev Neretin (MPI Bremen).

**Switzerland**: Timothy I. Eglinton (ETH, Zurich); Carsten J. Schubert, Limn. Res. Centre, Kastanienbaum.

**Great** **Brittan**: Helen Talbot (University of Newcastle)

**Australia**: John K. Volkman (CSIRO Marine Research), John A.E. Gibson (University of Tasmania).

**Egypt**: Rania Siam (American University in Cairo).

**PARTICIPATION IN EDUCATION PROGRAM:**

### ICBM, University of Oldenburg: Tuition of graduate course on Ecology and Physiology of Micro-Organisms (summer 1997, 1998, 1999); Tuition of graduate course on microbiological methods (spring 1998); Tuition of an intensive practical course for advanced students who co-operated in the different research projects of our department (autumn 1997).

### University of Groningen: Supervision of Research Assistant: Eduard Post.

### Royal NIOZ: Supervision of undergraduate students: Claire Moulis (2001), Fedor Gassner (2002), Simone de Haas (2003); Supervision of graduate student Arjan Boere (2005-2010; defended thesis on 29 Oct 2010).

**SUPERVISION AT WHOI:**

### Postdoctoral Investigators: Erin Banning (Aug 2010-present)

### Guest Students: Jeroen van de Giessen, Leiden University (Sep 2008-Feb 2010), Arjan Boere, Royal NIOZ (Oct.-Nov. 2008), Nardine Rasmy Marsis, American Univ. Cairo (Jan-Mar 2010), Yves Kaganika, Leiden University (Sep 2010-May 2011).

### Summer student fellows: Christopher Ward (2006) and Elizabeth Zhu (2008).

* Research Assistants II: Nan Trowbridge (Feb 2006 to Dec 2009) and Tzu-Hsuan Yang (Jan 2009-present).

**CRUISE PARTICIPATION**

* July/August 2010: Participation on scheduled cruise on board of the R/V *Sovetskaya Arktika* to subsample Quaternary permafrost outcrops along the Siberian Arctic coast of the Yenisey Gulf, Kara Sea. The collected samples will be collected with funding through WHOI’s Arctic Research Initiative for the pending NSF-Arctic Research proposal to study microbial activity and organic matter bioavailability in Arctic permafrost soils.
* July/August 2008: Field trip to Toolik Field Station, Alaska with Summer Student Fellow Elizabeth Zhu (Williams College, MA) and Research Assistant Nan Trowbridge to sample permafrost cores and Kuparuk River sediment, rock biofilms, and water for the WHOI-Arctic Research Initiative funded project entitled: “*Is thawing permafrost as a result of global warming a possible significant source of degradable organic matter for microbiota residing in situ and in Arctic rivers?”* Permafrost and riverine microbial hydrolytic ectoenzyme activities were directly measured at the Toolik Field Station.
* September 2006: Chief Scientist during the Black Sea cruise with the R/V *Akademik* of the Bulgarian Academy of Sciences.Holocene sediment cores and particulate organic matter (POM) from the water column of the western basin were obtained for the NSF-funded project entitled *“Exploration of fossil DNA-based geobiologic archives to reconstruct hydrologic changes in the Black Sea during the Holocene”.*
* October-December 2000: Field trip to Davis Station, Vestfold Hills, eastern Antarctica to sample Holocene sediment cores and POM from permanently stratified and anoxic lakes and fjords for the initial appointment as a postdoctoral investigator at the Royal NIOZ. In the initially funded NWO-ALW proposal, the modern planktonic communities were going to be studied using the combined analysis of lipid fingerprints and genetic markers whereas the Holocene communities as recorders of hydrological changes were only going to be studied based on their fossil lipid biomarkers. Therefore, I initiated the idea of including the novel field of “sedimentary paleogenetics” to study the Holocene planktonic community structures in unprecedented detail. The results stemming from this work resulted in two additional NWO funded projects, including the above listed VENI award.
* January/February 1998: Participating scientist on R/V Meteor Leg 40/4, Eastern Mediterranean Sea to collect Pleistocene sapropel cores to study the ongoing microbial degradation of the ancient sapropel organic matter as well as to reconstruct the paleoecology and environment during sapropel deposition.

**PAPERS IN REFEREED JOURNALS AND BOOKS**

 **SUBMITTED, in REVISION, or ACCEPTED**

* Coolen, M.J.L., J. van de Giessen, E.Y. Zhu, C. wuchter. *Bioavailability of soil organic matter and microbial community dynamics upon permafrost thaw, Environmental Microbiology (special issue)* (submitted)*.*
* **Coolen, M. J. L**., 7000 years of virus-host molecular dynamics in the Black Sea, *Science* (in revision since Nov 2010).
* Boere, A. C., W. I. C. Rijpstra, G. De Lange, J. S. Sinninghe Damsté, **M. J. L. Coolen**, Preservation potential of ancient DNA in Pleistocene marine sediments: Implications for paleoenvironmental reconstructions, *Geobiology* (submitted).
* Boere, A. C., J. S. Sinninghe Damsté, W. I. C. Rijpstra, J.K. Volkman, **M. J. L. Coolen**, Source-specific variability in post-depositional DNA preservation with potential implications for DNA-based paleecological records, *Organic Geochemistry* (submitted).
* Boere, A. C., W. I. C. Rijpstra, G. De Lange, J. S. Sinninghe Damsté, **M. J. L. Coolen**, Exploring preserved ancient dinoflagelalte and haptophyte DNA signatures to infer ecological and environmental conditions during sapropel S1 formation in the eastern Mediterranean (in press).

**PUBLISHED**

* **Coolen, M.J.L.** and J.A.E. Gibson, Ancient DNA in lake sediment records, *PAGES News*, 17(3), 104-106, 2009.
* **Coolen, M. J. L.** and G. Shtereva, Metabolically active eukaryotes along a vertical nutrient and redox gradient in the water column and sulfidic surface sediment of the Black Sea, *FEMS Microbiol. Ecol.,* *70*, 525-539, 2009.
* **Coolen, M. J. L.**, J. P. Saenz, L. Giosan, N. Y. Trowbridge, P. Dimitrov, D. Dimitrov and T. I. Eglinton, DNA and lipid molecular stratigraphic records of haptophyte succession in the Black Sea during the Holocene, *Earth. Planet. Sc. Lett.,* *284*(3-4), 610-621, 2009.
* Herfort, L., J.-H. Kim, **M. J. L. Coolen**, B. Abbas, S. Schouten, G. J. Herndl and J. S. Sinninghe Damsté, Diversity of Archaea and potential for crenarchaeotal nitrification of group 1.1a in the rivers Rhine and Têt, *Aquat Microb Ecol* 55: 189-201, 2009.
* **Coolen, M. J. L**., H. M. Talbot, B. A. Abbas, C. Ward, S. Schouten, J. K. Volkman and J. S. Sinninghe Damsté, Sources for sedimentary bacteriohopanepolyols as revealed by 16S rDNA stratigraphy, *Environ. Microbiol.,* *10*(7), 1783-1803, 2008.
* Talbot, H. M., **M. J. L. Coolen** and J. S. Sinninghe Damsté, An unusual 17[α],21[β](H)-bacteriohopanetetrol in Holocene sediments from Ace Lake (Antarctica), *Org. Geochem.,* *39*(8), 1029-1032, 2008.
* **Coolen, M. J. L**., J. K. Volkman, B. Abbas, G. Muyzer, S. Schouten and J. S. Sinninghe Damsté, Identification of organic matter sources in sulfidic late Holocene Antarctic fjord sediments from fossil rDNA sequence analysis, *Paleoceanography,* *22*(2), PA2211, doi:10.1029/2006PA001309, 2007.
* Herfort,L., Schouten,S., Abbas,B., Veldhuis,M.J.W., **Coolen,M.J.L**., Wuchter,C. et al. Variations in spatial and temporal distribution of Archaea in the North Sea in relation to environmental variables. *FEMS Microbiol Ecol* 62: 242-257, 2007
* **Coolen, M. J. L.**, B. Abbas, J. van Bleijswijk, E. C. Hopmans, M. M. M. Kuypers, S. G. Wakeham and J. S. Sinninghe Damsté, Putative ammonia-oxidizing Crenarchaeota in suboxic waters of the Black Sea: a basin-wide ecological study using 16S ribosomal and functional genes and membrane lipids, *Environ. Microbiol.,* *9*(4), 1001-1016, 2007b.
* **Coolen, M. J. L.** and J. Overmann, 217 000-year-old DNA sequences of green sulfur bacteria in Mediterranean sapropels and their implications for the reconstruction of the paleoenvironment, *Environ. Microbiol.,* *9*(0), 238-249, 2007.
* Sinninghe Damsté, J. S., W. I. Rijpstra, **M. J. L. Coolen**, S. Schouten and J. K. Volkman, Rapid sulfurisation of highly branched isoprenoid (HBI) alkenes in sulfidic Holocene sediments from Ellis Fjord, Antarctica, *Org. Geochem.,* *38*(1), 128-139, 2007.
* Schubert, C. J., **M. J. L. Coolen**, L. N. Neretin, A. Schippers, B. Abbas, E. Durisch-Kaiser, B. Wehrli, E. C. Hopmans, J. S. Sinninghe Damsté, S. Wakeham and M. M. M. Kuypers, Aerobic and anaerobic methanotrophs in the Black Sea water column, *Environ. Microbiol.,* *8*(10), 1844-1856, 2006.
* Sinninghe Damsté,J.S. and **M.J.L. Coolen**, Fossil DNA in Cretaceous Black Shales: Myth or Reality? *Astrobiology* 299-302, 2006
* **Coolen, M. J. L**., G. Muyzer, S. Schouten, J. K. Volkman and J. S. Sinninghe Damsté, Sulfur and methane cycling during the Holocene in Ace Lake (Antarctica) revealed by lipid and DNA stratigraphy, in Past and Present Marine Water Column Anoxia, NATO Science Series: IV-Earth and Environmental Sciences, edited by L. N. Neretin, pp. 41-65, Springer, Dordrecht, 2006b.
* **Coolen, M. J. L.**, A. Boere, B. Abbas, M. Baas, S. G. Wakeham and J. S. Sinninghe Damsté, Fossil DNA derived from alkenone-biosynthesizing haptophytes and other algae in Holocene sediment from the Black Sea, *Paleoceanography,* *21*, PA1005-doi:10.1029/2005PA001188, 2006a.
* Wuchter, C., B. Abbas, **M. J. L. Coolen**, L. Herfort, B. J. van, P. Timmers, M. Strous, E. Teira, G. J. Herndl, J. J. Middelburg, S. Schouten and J. S. Sinninghe Damsté, Archaeal nitrification in the ocean, *Proc. Natl. Acad. Sci. U. S. A.,* *103*(33), 12317-12322, 2006. *This paper resulted in the prestigious Raymond Lindeman Award (ASLO) to Cornelia Wuchter in 2008*.
* **Coolen, M. J. L.**, E. Post, C. C. Davis and L. J. Forney, Characterization of microbial communities found in the human vagina by analysis of terminal restriction fragment length polymorphisms of 16S rRNA genes, *Appl. Environ. Microbiol.,* *71*(12), 8729-8737, 2005.
* Stadnitskaia, A., G. Muyzer, B. Abbas, **M. J. L. Coolen**, E. C. Hopmans, M. Baas, T. C. E. Van Weering, M. K. Ivanov, E. Poludetkina and J. S. Sinninghe Damsté, Biomarker and 16S rDNA evidence for anaerobic oxidation of methane and related carbonate precipitation in deep-sea mud volcanoes of the Sorokin Trough, Black Sea, *Mar. Geol.,* *217*(1-2), 67-96, 2005.
* Wuchter, C., S. Schouten, **M. J. L. Coolen** and J. S. Sinninghe Damsté, Temperature-dependent variation in the distribution of tetraether membrane lipids of marine Crenarchaeota: Implications for TEX86 paleothermometry, *Paleoceanography,* *19*(4), PA4028, doi:10.1029/2004PA001041, 2004.
* **Coolen, M. J. L**., G. Muyzer, W. I. C. Rijpstra, S. Schouten, J. K. Volkman and J. S. Sinninghe Damsté, Combined DNA and lipid analyses of sediments reveal changes in Holocene haptophyte and diatom populations in an Antarctic lake, *Earth. Planet. Sc. Lett.,* *223*, 225-239, 2004b.
* **Coolen, M. J. L.**, E. C. Hopmans, W. I. C. Rijpstra, G. Muyzer, S. Schouten, J. K. Volkman and J. S. Sinninghe Damsté, Evolution of the methane cycle in Ace Lake (Antarctica) during the Holocene: Response of methanogens and methanotrophs to environmental change, *Org. Geochem.,* *35*(10), 1151-1167, 2004a.
* **Coolen, M. J. L.**, H. Cypionka, A. M. Sass, H. Sass and J. Overmann, Ongoing modification of Mediterranean Pleistocene sapropels mediated by prokaryotes, *Science,* *296*(5577), 2407-2410, 2002.
* Sass, A. M., H. Sass, **M. J. L. Coolen**, H. Cypionka and J. Overmann, Microbial communities in the chemocline of a hypersaline deep-sea basin (Urania basin, Mediterranean Sea), *Appl. Environ. Microbiol.,* *67*(12), 5392-5402, 2001.
* **Coolen, M. J. L.** and J. Overmann, Functional exoenzymes as indicators of metabolically active bacteria in 124,000-year-old sapropel layers of the Eastern Mediterranean Sea, *Appl. Environ. Microbiol.,* *66*(6), 2589-2598, 2000.
* Overmann, J., **M. J. L. Coolen** and C. Tuschak, Specific detection of different phylogenetic groups of chemocline bacteria based on PCR and denaturing gradient gel electrophoresis of 16S rRNA gene fragments, *Arch. Microbiol.,* *172*(2), 83-94, 1999.
* **Coolen, M. J. L.** and J. Overmann, Analysis of subfossil molecular remains of purple sulfur bacteria in a lake sediment, *Appl. Environ. Microbiol.,* *64*(11), 4513-4521, 1998.
* Nijburg, J. W., **M. J. L. Coolen**, S. Gerards, P. J. A. K. Gunnewiek and H. J. Laanbroek, Effects of nitrate availability and the presence of *Glyceria maxima* the composition and activity of the dissimilatory nitrate-reducing bacterial community, *Appl. Environ. Microbiol.,* *63*(3), 931-937, 1997.

**OTHER PUBLICATIONS**

* J. Overmann, **M.J.L. Coolen**, A. Smock, H. Sass, and H. Cypionka.Microbial activities and populations in upper sediment and sapropel layers. In: Hieke, W., C. Hemleben, P. Linke, M. Türkay, and H. Weikert (eds) METEOR-Berichte 99-2, Mittelmeer 1997/1998 Cuise No. 40. Leitstelle METEOR, Institut für Meerseskunde der Universität Hamburg. Pp. 148-157.

**RECENT INVITED and/or PLENARY LECTURES**

* **Coolen, M.J.L**., J. van den Giessen, L. Giosan, S. Sylva, M, Filipova, and T.I. Eglinton. 14,000 years of molecular plankton succession dynamics in the Black Sea. Invited, Session 18. Paleobiogeochemistry and Ancient Microbial Environments of the International Symposium on Microbial Ecology (ISME13). Seattle, WA, USA. 22-27 August, 2010.
* **Coolen, M.J.L**., J. van den Giessen, S. Sylva, L. Giosan, and T.I. Eglinton. 14,000 years of molecular plankton succession dynamics in the Black Sea. Invited, plenary presentation. Workshop: US-China Collaborative Research on Geomicrobiological Processes in Extreme Environments. Penn State University, May 18-23, 2010.
* **Coolen, M.J.L.** Sedimentary paleogenomics: a novel window into palaeoecology, palaeoenvironment, and palaeoclimate". Invited. Gordon Research Conference on Chemical Oceanography, Process, Dynamics, And Change In The Anthropocene Ocean, Tilton School, Tilton, NH August 5, 2009
* **Coolen, M.J.L.** The post-glacial biota of the Black Sea as revealed by paleogenetics. Invited. American Genetic Association Annual Symposium. Genetics and Genomics of Environmental Change 8-11 June 2009 Brown University Providence, RI.
* **Coolen, M.J.L.** Pyrosequencing: A window into the Holocene coastal plankton, fauna, and vegetation of the Black Sea. Invited. International Census of Marine Microbes (ICoMM) 454 Users Spring Meeting, April 6-9th, 2009. Marine Biology Laboratory (MBL), Woods Hole.
* Liz Zhu and **M.J.L. Coolen**. Is thawing permafrost as a result of global warming a significant source of degradable organic matter for microbiota residing in situ and in Arctic rivers? Invited. AGU Fall Meeting, San Francisco, 2008. (*Liz Zhu was 1 of 18 students nation-wide to be selected for an award via the University of Wisconsin-Milwaukee NSF-OCE REU program to present this poster at the AGU)*.
* **Coolen, M.J.L**., J. Saenz, N. Trowbridge, S. Sylva, L. Giosan, and T.I. Eglinton. The Holocene ecology and environment of the Black Sea as revealed by sedimentary paleogenomics. Invited. Workshop Evolution Across Scales, University of Potsdam, Germany. May 2008.
* **Coolen, M.J.L.** Sedimentary paleogenomics: A new window into paleoecology and paleoenvironments. MIT Chemical Oceanography and Biogeochemistry seminar, Cambridge, MA, March 14, 2008.
* **Coolen, M.J.L**., J. Saenz, N. Trowbridge, S. Silva, L. Giosan, and T.I. Eglinton. Fossil DNA stratigraphy revealed multiple sources of alkenones in the Holocene Black Sea at the strain level: Implications for UK37 paleothermometry. Invited. AGU Fall 2007 meeting, San Francisco, CA. Published abstract PP53A-03.
* Boere, B. Abbas, G. Versteegh, J.K. Volkman, J.S. Sinninghe Damsté, and **M.J.L. Coolen**. A qualitative and quantitative comparison of sedimentary palynomorphs, lipid biomarkers, and fossil DNA: Which tool provides the most detailed paleoecological and paleoenviornmental information? Invited. AGU Fall 2007 meeting, San Francisco, CA. Published abstract PP32B-07

# Coolen, M.J.L. Preserved genetic signatures reveal what traditional biomarkers failed to tell us about the Holocene Black Sea environment. Invited. Gordon Research Conference on Applied and Environmental Microbiology, Mount Holyoke College, South Hadley, MA, July 15-20, 2007.

* **Coolen, M.J.L**., B. Abbas, A. Boere, G. Muyzer, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. Fossil DNA as a recorder of ancient microbial communities and paleo-environments. Presented at:

1. AGU Fall 2005 Meeting, San Francisco, CA. Published abstract PP14B-04

2. Brown University, RI (10/14/2005).

3. MIT, MA Chemical Oceanography and Biogeochemistry seminar (09/30/2005).

4. International Meeting on Organic Geochemisty (IMOG), Seville, Spain (09/12/2005). (Invited and Plenary). Abstract was published in the 22 IMOG Abstract Book.

* **Coolen, M.J.L**., G. Muyzer, S. Schouten, J.K. Volkman, and J.S. Sinninghe Damsté. Lipid and fossil rDNA stratigraphy reveals impact of environmental changes on the ancient microbial community of meromictic, euxinic Ace Lake (Antarctica). Presented at:

1. CSIRO Marine Research, Hobart, Tasmania, Australia. 20 October 2003.

2. NATO Advanced Research Workshop on Past and Present Water Column Anoxia. 4-8 October 2003, Sevastopol, Crimea, Ukraine.