



Bioremediation of PCBs Using Biofilms

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College Park Scholars – Science & Global Change Program

Bioengineering

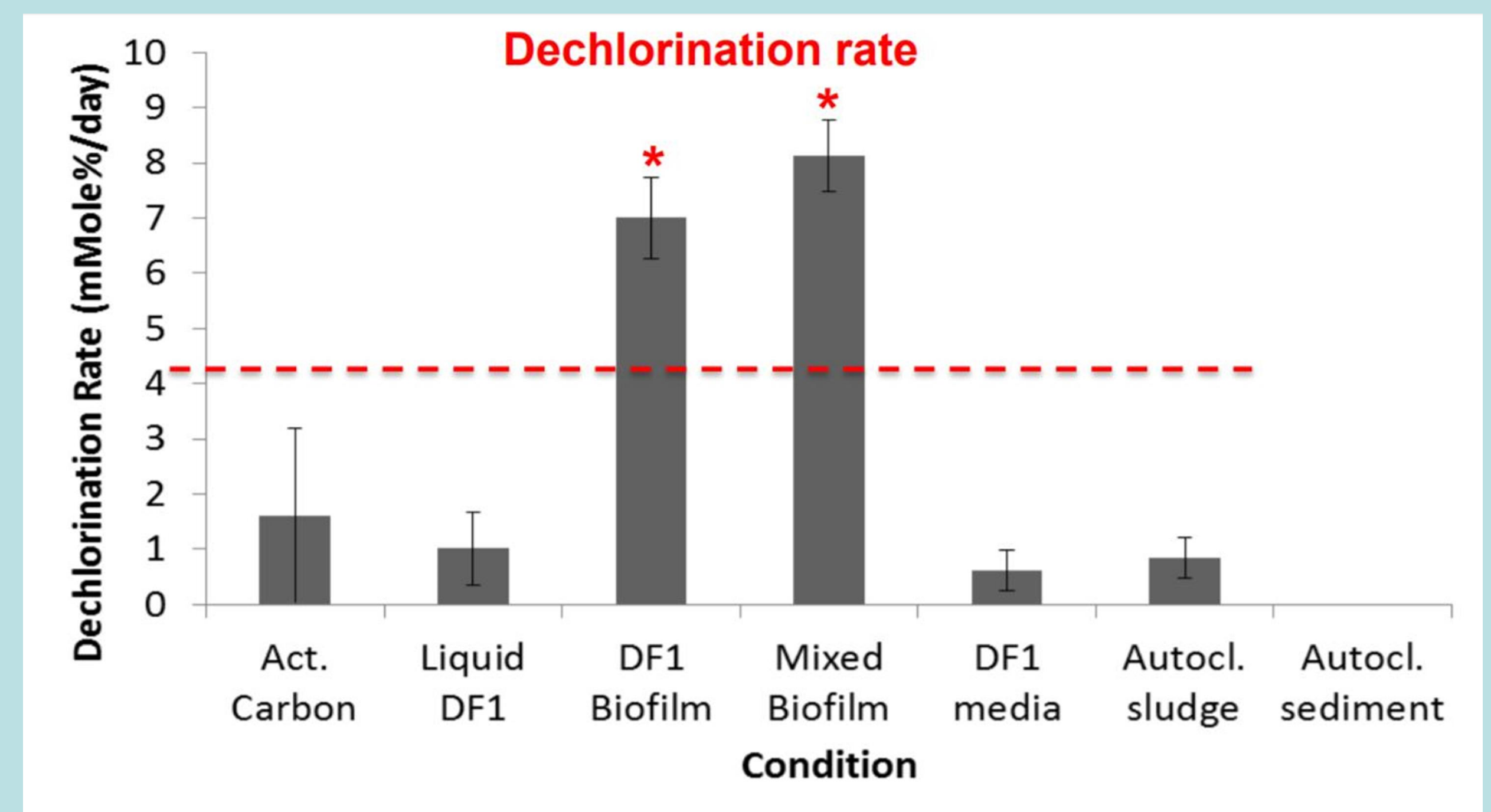
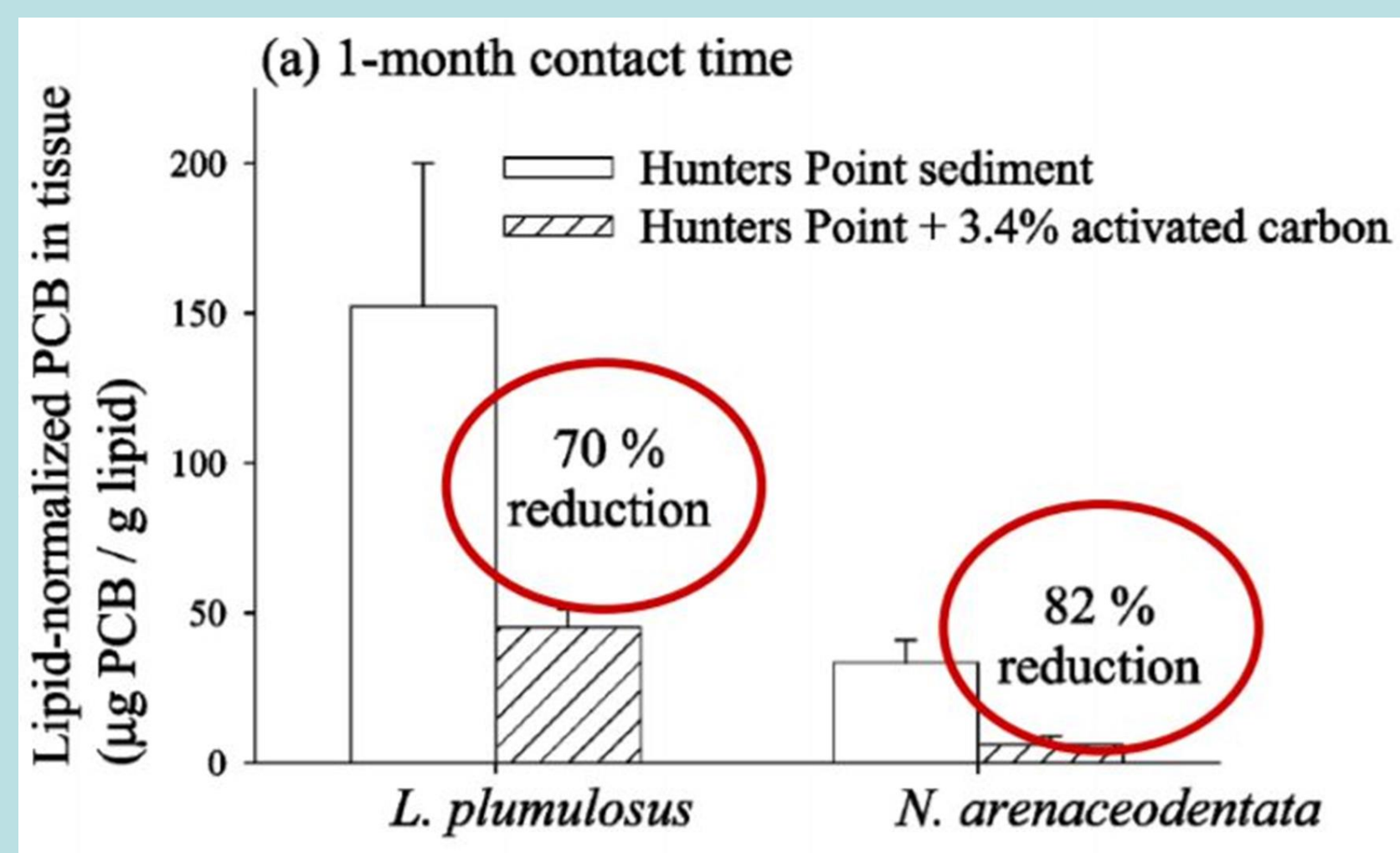
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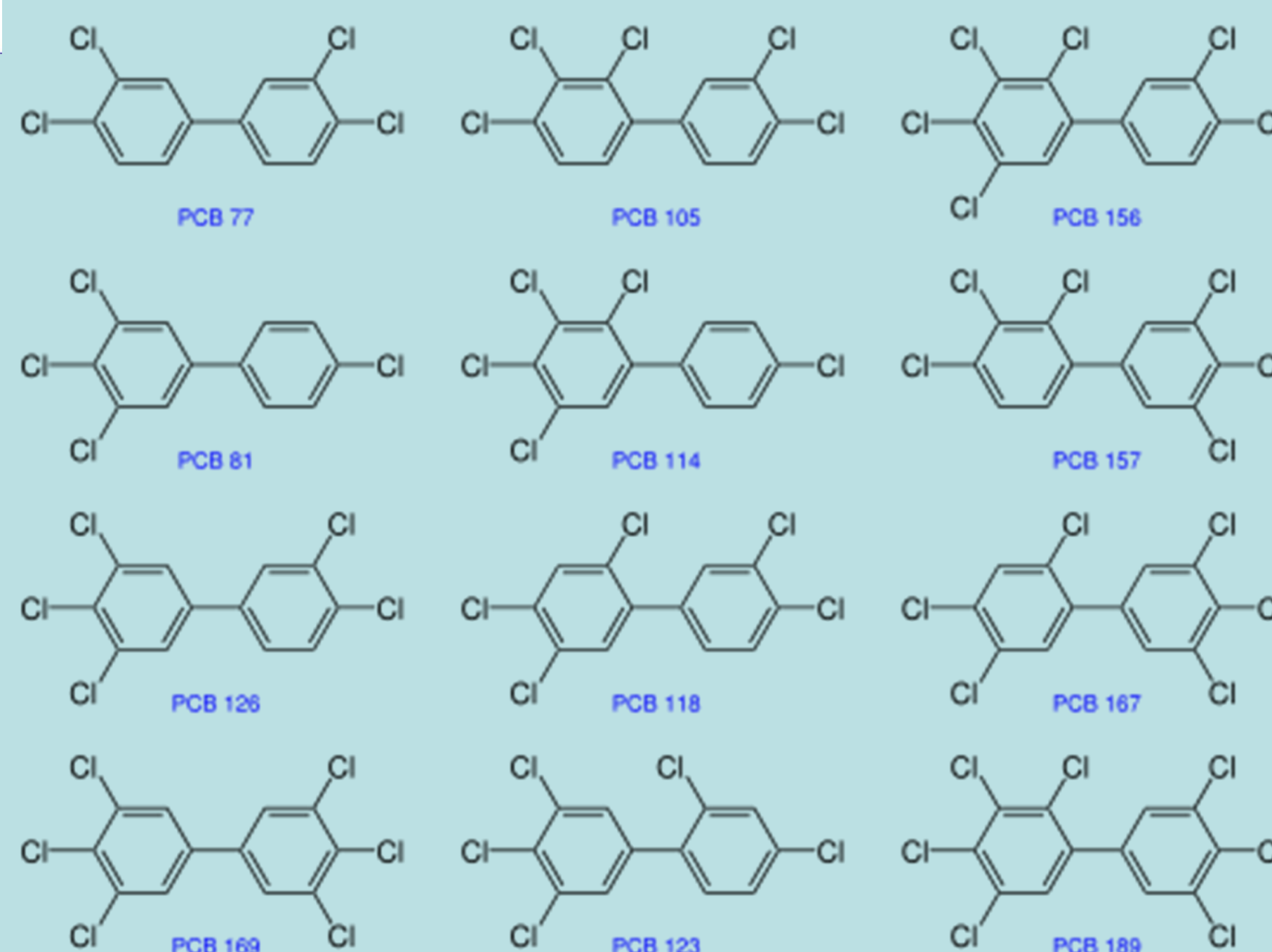
Introduction

PCB stands for polychlorinated biphenyls. These organic chlorine compounds are used widely in various manufacturing. Since being classified as carcinogens and persistent organic pollutants their production has been banned in the United States.



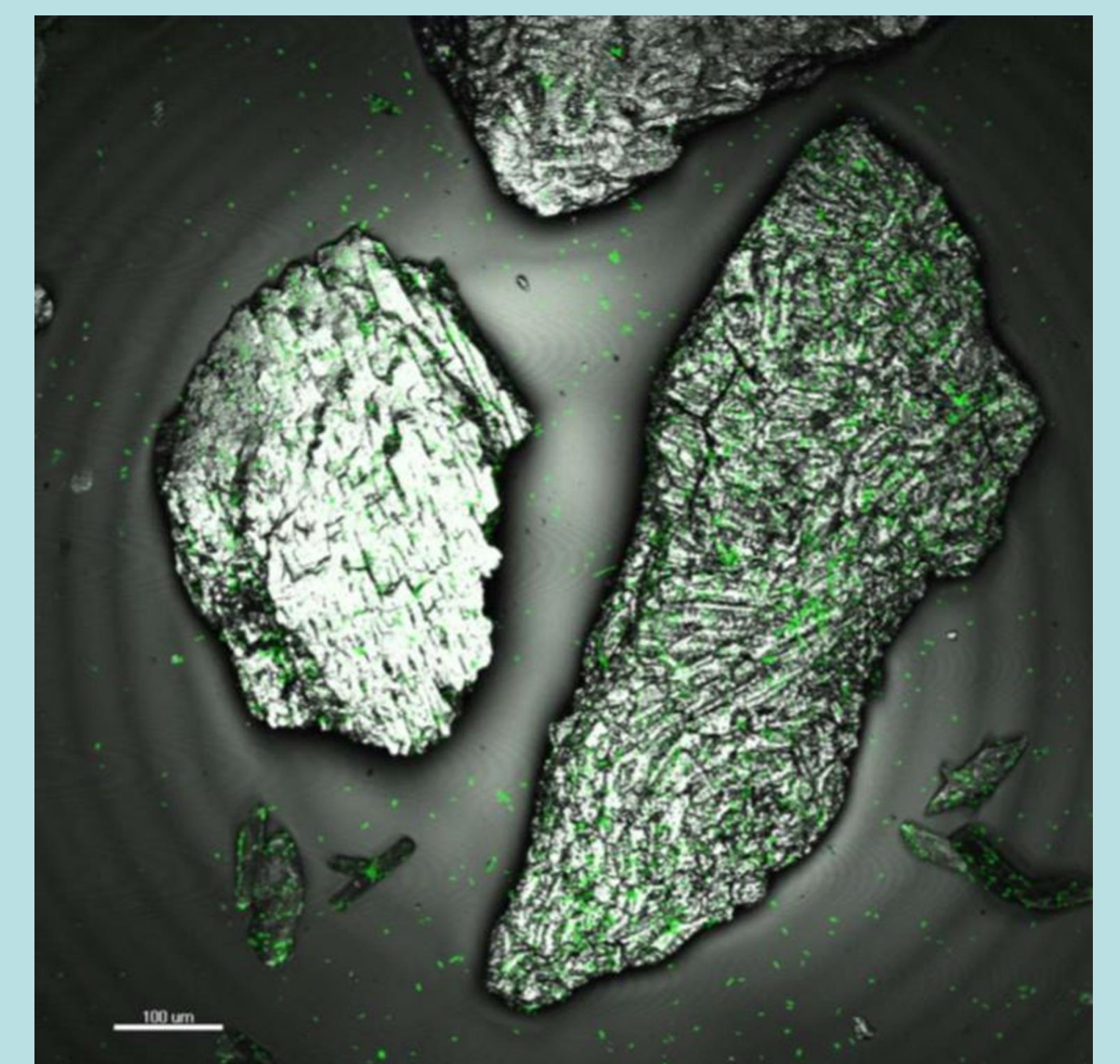
Discussion

Activated carbon has been found to reduce the amount of harmful PCBs brought into animal tissue. *L. plumulosus* and *N. arenaceodentata* are species found in sediment that have been used to demonstrate a reduced bioavailability. The use of biofilms with activated carbons has been found to increase the dechlorination rate.



Activities

With the increased dechlorination rate with the use of biofilms and activated charcoal, current research works to identify the mechanism responsible for biofilm-based bioaugmentation. Some activities in the lab include isolating activated carbons, biochars, zeolite, and sand. Experiments involve assessing recontamination of sediment from wastewater.

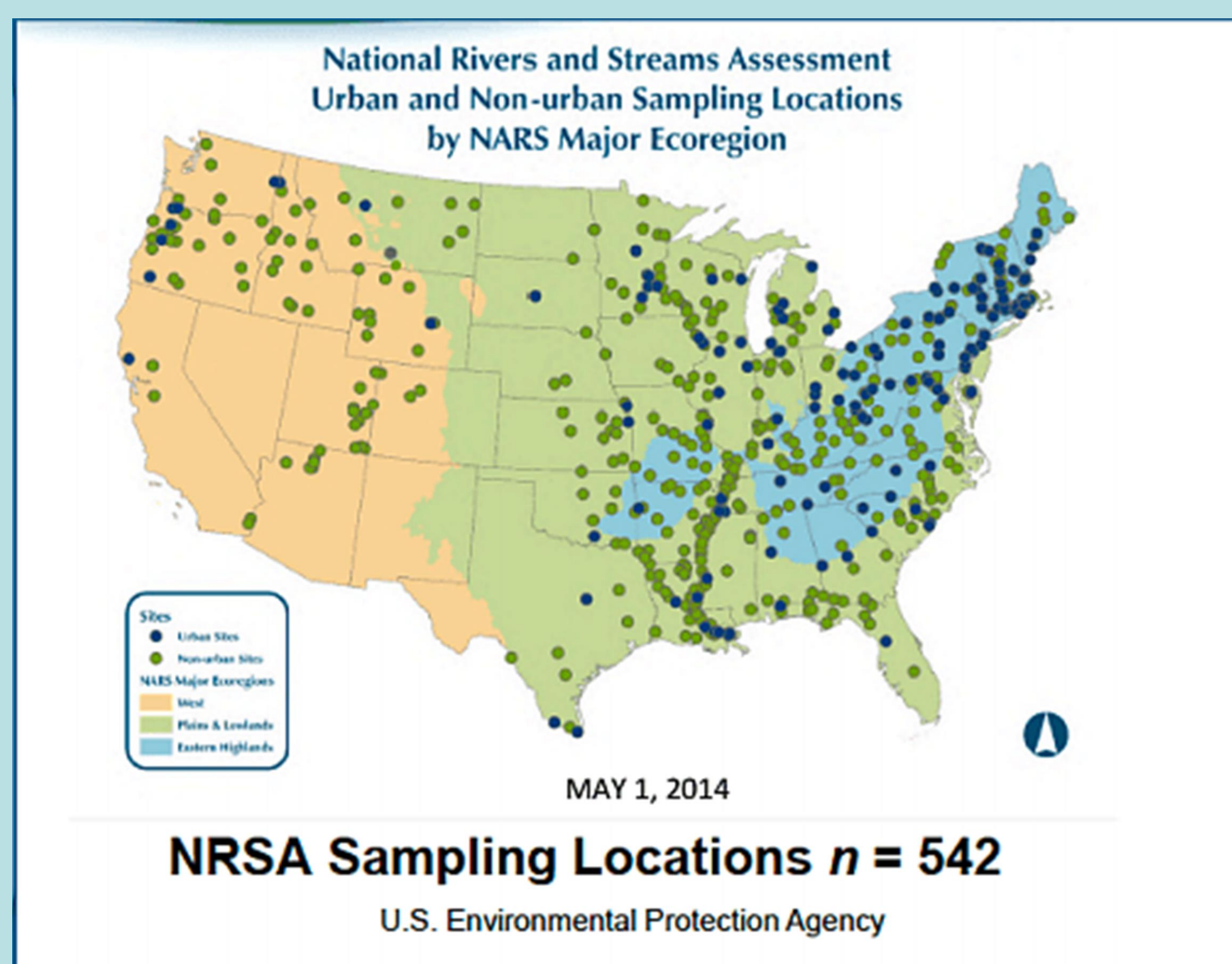


Future Work

Research has halted based on the current restrictions posed by the global pandemic. When research can continue, more experiments will continue to measure the dechlorination rate of various carbons with biofilms on sediment and wastewater.

Acknowledgements

I'd like to acknowledge Dr. Holtz and Dr. Merck for their work and organization of the Science and Global Change Program and Dr. Kjellerup for her work in the Civil and Environmental Engineering department. The research found comes from the work published under: Kjellerup, Birthe. "Treatment Media for Control of Persistent Organic Pollutants and Metals in Stormwater." ER18-1303 Project Overview, www.serd-p-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Sediments/Stormwater/ER18-1303. Kjellerup, Birthe Veno. "Bioremediation of Polychlorinated Biphenyls (PCBs) Using Biofilms." *Federal Remediation Technologies Roundtable*, 2016, frtr.gov/pdf/meetings/may16/presentations/kjellerup-presentation.pdf.



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Goal: develop new and innovative treatment media or mixes of media to provide optimum removal of PCBs and metals from stormwater runoff originating from Department of Defense (DoD) sites.

