Tracking Seasonal Changes of Specific Pathogenic Bacteria around Mobile Bay

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The Mobile Bay is the sixth largest watershed in the nation and has the fourth largest freshwater discharge in forty-eight states. This unique estuary is home to a diverse bacterial community that drives important biogeochemical cycles; however, variations in environmental parameters, such as salinity, can cause an increase in the abundance of human bacteria, especially during the summer. In this area, specific bacterial species, such as Bacteroidales, Vibrio cholerae, and Vibrio vulnificus are naturally occurring bacteria common throughout the different water sources around Mobile Bay. Recent reports show that certain human pathogenic bacteria have been affecting people causing serious illnesses and discovered that certain pathogenic bacteria, such as the Vibrio vulnificus, are more common throughout Mobile Bay during different seasons of the year. Also, overflowing of water sewage treatment plants and human impact around the bay has caused the presence of human Bacteroidales species. Water samples from five sites were collected monthly from October 2016 to January 2017. Physiochemical parameters were measured throughout the watershed, DNA was extracted, and polymerase chain reaction (PCR) was used to target the 16S rRNA gene of known human pathogens. Abundances of the targeted bacterial species, Bacteroidales, Vibrio cholerae, and Vibrio vulnificus were compared across the five sites to determine the temporal-spatial distribution of the targeted bacterial species. Results of this study showed that Vibrio cholerae and Vibrio vulnificus followed temporal and spatial distribution, while Bacteroidales presence followed human impact.

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