


Fundamental Concepts: Biology

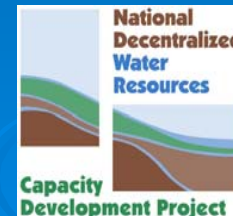
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Management

The background of the slide is a solid blue color. In the lower right quadrant, there are several sets of concentric, light blue circles that resemble ripples in water. These circles are of varying sizes and are arranged in a way that suggests movement or a series of events.

Acknowledgement

This work was supported [in part] by the National Decentralized Water Resources Capacity Development Project with funding provided by the U.S. Environmental Protection Agency through a Cooperative Agreement (EPA No. CR827881-01-0) with Washington University in St. Louis. The results have not been reviewed by EPA or Washington University in St. Louis. The views expressed in this presentation are solely those of NCSU, and University of Arkansas. NCSU, University of Arkansas, EPA and Washington University in St. Louis do not endorse any products or commercial services mentioned in the presentation.

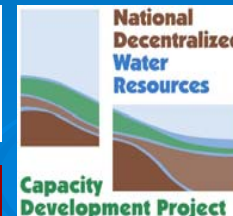


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 Washington University in St. Louis



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for Decentralized Wastewater Management.
National Decentralized Water Resources
Capacity Development Project. University of
Arkansas, Fayetteville, AR.

Importance

- Largely responsible for reduction of organic material in wastewater
- Use organic matter as a food supply to support the growth of biomass
- By using the organic material, the microbial communities reduce the concentration

Types of Microbial Communities

- Aerobic
- Anaerobic
- Facultative

Aerobic Organisms

- Perform best when waters are well aerated and contain relatively high concentrations of dissolved molecular oxygen



Anaerobic Organisms

- Perform best in conditions with little or no molecular oxygen
- Obtain needed oxygen from molecules that contain oxygen

Facultative Organisms

- Prefer aerobic conditions but easily adapt to low oxygen circumstances



Temperature and Growth

- Growth rates increase with increasing temperature (0 to 55 °C)
- Growth rates approximately double for a 10 °C rise in temperature
- Temperature extremes may interfere with metabolic processes or harm the organisms

Toxicity

- Many microbial organisms are able to adapt to changes in their environment—if changes are gradual
- Sudden changes or introduction of toxic materials may be harmful or lethal to the biological community
- introduction of toxic substances (household bleach) may prove detrimental