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A Water Quality Study of Germany Brook, A Tributary of the Neponset River

Boston College High School

Participants

- Brian Cincotta
- Michael Falvey
- Matt Hoar
- Jean-Phillipe Innocent
- Ben Jamieson
- Brett Kenney
- Max Larkin
- Tim Mulhall
- Christian O'Neill
- Kevin Ouellette
- Chris Traft

Theresa and Roger Poole
of the Department, Milwaukee

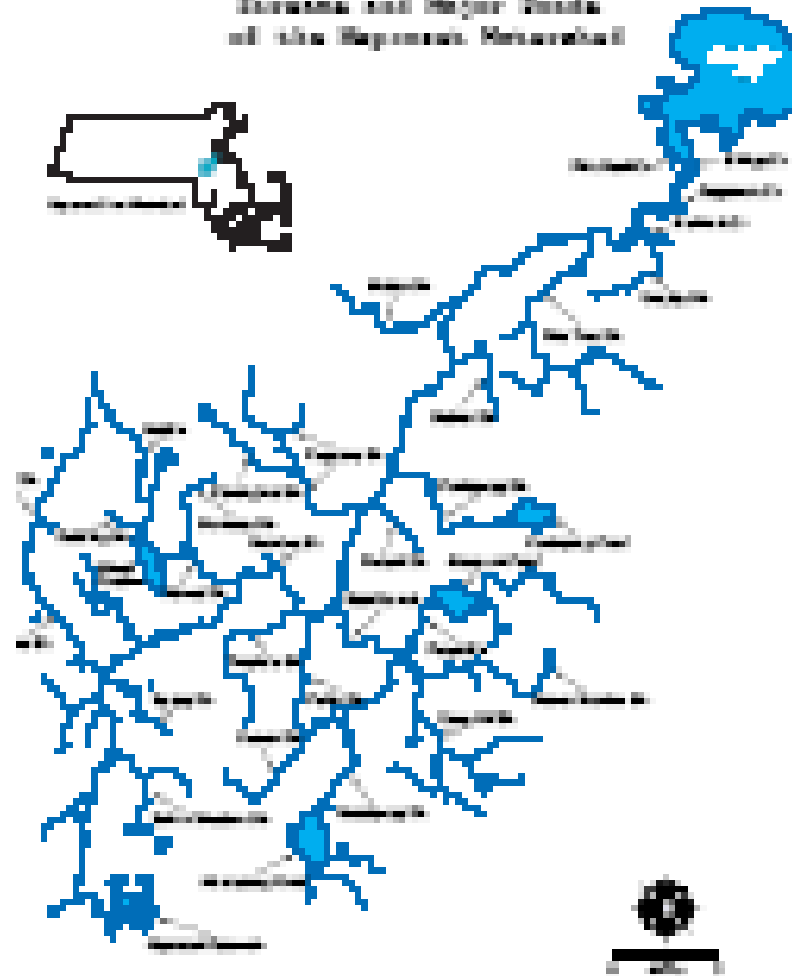


Figure 10: Map of the study area showing the distribution of the study area.

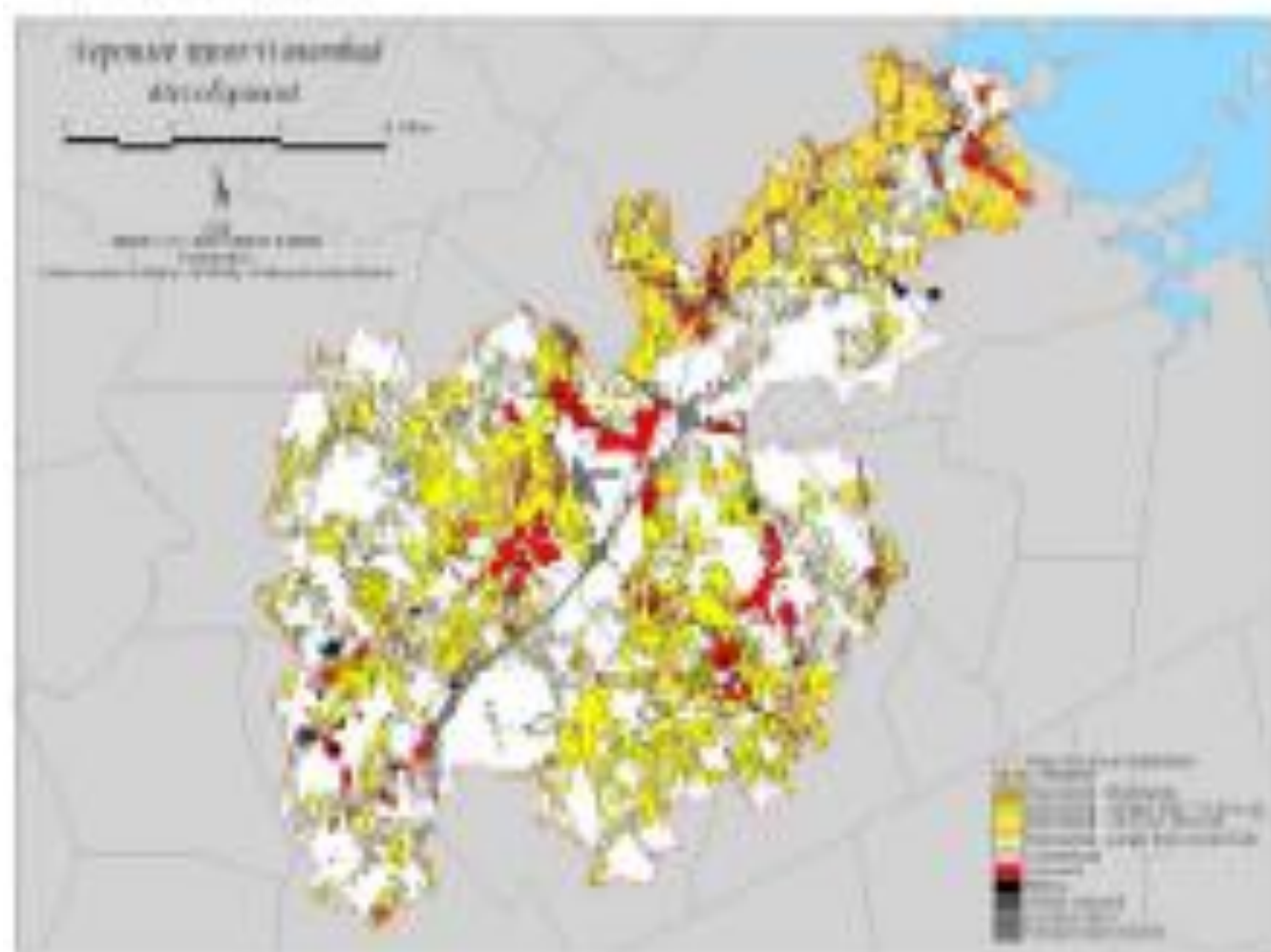


Figure 10: Map of the study area

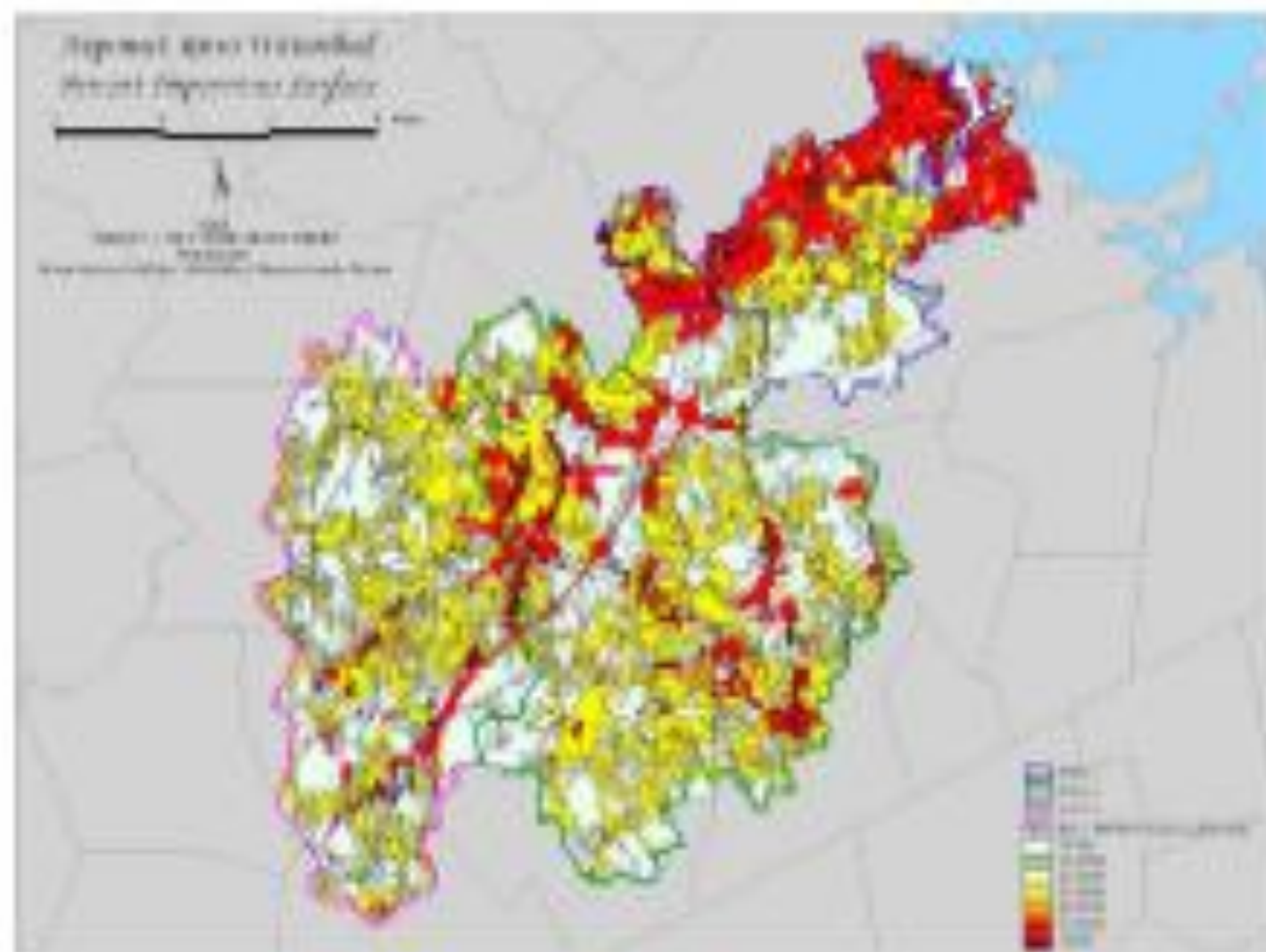


Figure 10: Map of the study area

Background

- Monitoring by volunteers affiliated with the Neponset River Watershed Association has indicated impaired water quality of Germany Brook resulting in an overall water quality grade of “C” reflecting:
 - Channelization
 - Lack of a riparian buffer zone
 - Seasonally low water flows
 - Runoff from impervious surfaces

- As a result of these impacts:
 - Severe nutrient inputs have been noted with 86% of total nitrogen and orthophosphate samples exceeding acceptable levels
 - Severe bacterial contamination with 75% of wet weather samples exceeding standards with FC counts as high as 5,100 CFU recorded.

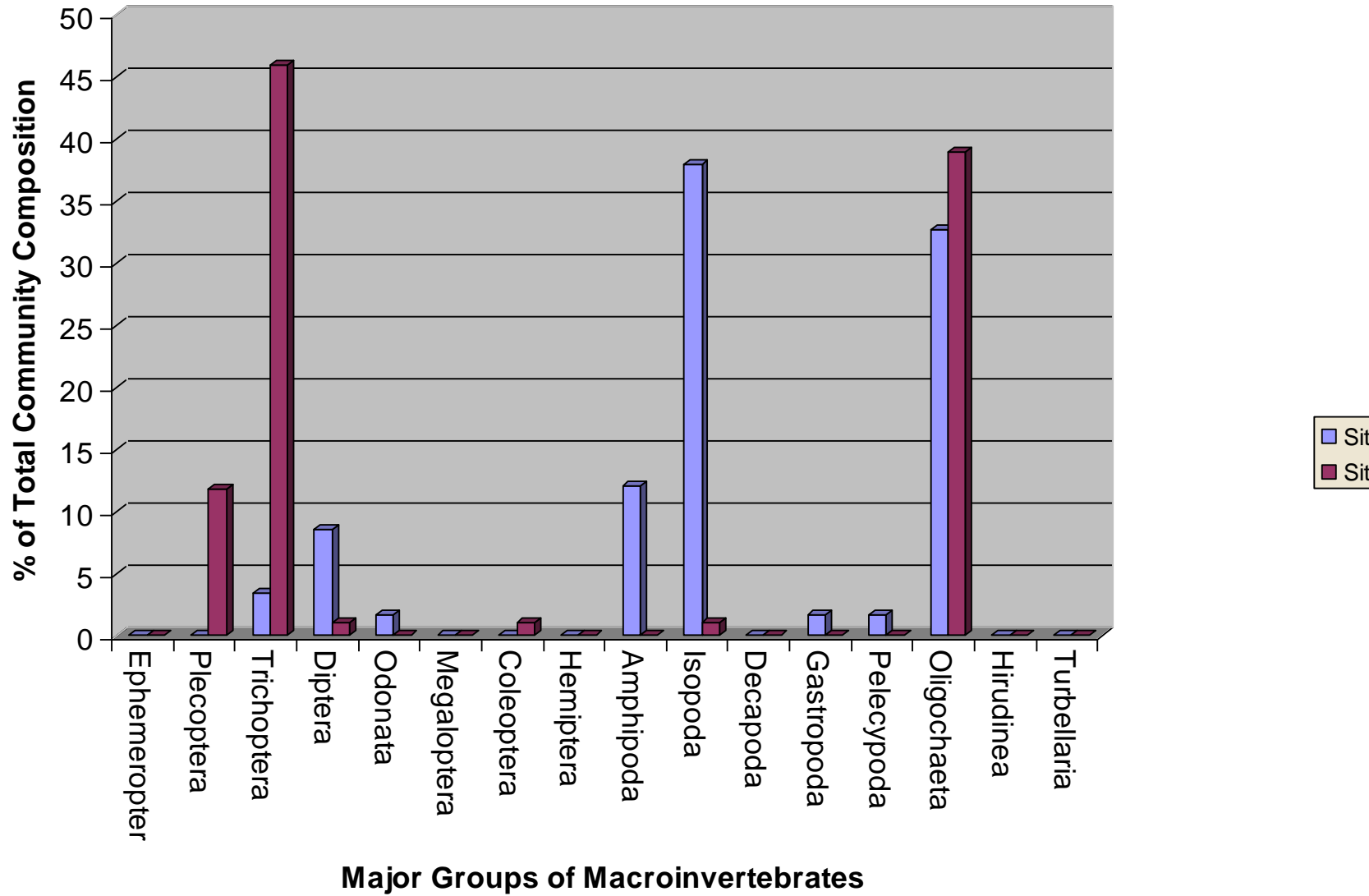
Objective

- Although some volunteer sampling of the lower reaches of Germany Brook has been conducted, there is no data for upstream areas or for benthic macroinvertebrate community structure.
- Therefore, initial invertebrate sampling was conducted to determine the potential impact of differing land use regimes on these communities by sampling at similar upstream and downstream sites during October, 2005.





Comparison of Macroinvertebrate Community Composition



Conclusions

- Our results demonstrate a significant difference in the composition of the macroinvertebrate community between the two sites.
- Although both sites are clearly impacted, surprisingly the upstream site had a notably higher Major Group Biotic Index (7.82) than the downstream one (5.19) with only 3.4% of the total community consisting of groups with tolerance values of 3 and below as opposed to 57.7 % of the downstream community.

- Although site 2 is downstream of a retired landfill and significant residential development and therefore might be expected to bear more of an impact, this difference might be overshadowed by lower flow regimes experienced at the upstream

Future Work

- The latest assessment of ongoing volunteer monitoring of the lower reaches of Germany Brook specifically calls for “more complex chemical analysis of water samples and macroinvertebrate sampling”
- We propose to conduct such work with additional assessments of seasonal changes in flow coupled with macroinvertebrate sampling at the Family level as we become more adept with identification

