iCAP Research Project Report - Academic Hour

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Project Summary

My research project this semester addressed a topic the iCAP Land & Water team has been considering for several years: the potential for graywater reuse on campus. While graywater reuse is increasingly common in other regions, current Illinois plumbing code does not permit many of the applications the team is interested in such as the use of graywater for toilet and urinal flushing.

Throughout the semester, I created two resources to aid the Land and Water team in future endeavors regarding graywater. The first document, "State Graywater Laws," was created to review state-level graywater regulations that explicitly allow toilet and urinal flushing, as well as other reuse applications currently prohibited in Illinois. By examining these states' regulatory frameworks, treatment requirements, permitting processes, and public health protections, the document is intended to serve as a reference point and potential model for any future efforts to explore or advocate for changes to Illinois' plumbing code.

The second document, an excel spreadsheet titled "Illinois Graywater Contacts" was designed to begin compiling a list of Illinois institutions, programs, and contacts that may have an interest in graywater reuse, non-potable water strategies, water conservation, or related research. This contact list can support the iCAP Land & Water team in identifying potential collaborators, advisors, or partners for future research, projects, or policy change efforts related to graywater reuse in Illinois.

Document Overview

State Graywater Laws:

- This document compiled graywater regulations from Arizona, California, Florida, Georgia, New Mexico, Oregon, and Texas, focusing on whether each state permits graywater use for toilet and urinal flushing. Important takeaways included:
    - All seven states explicitly permit toilet and urinal flushing with treated graywater.
    - Regulatory frameworks differ widely, ranging from highly detailed permitting systems (California, Oregon) to more flexible or tiered approaches (Arizona, New Mexico).

    - Some states distinguish between residential and commercial systems based on size or intended use (Florida, Arizona, Texas), while others emphasize technical standards over system classification (New Mexico, Georgia, California)
    - Indoor use generally requires higher-level treatment, dedicated non-potable piping, and measures to prevent human contact.
    - Other common approved uses for graywater include: subsurface or surface irrigation of landscapes, gardens, lawns, and plants; composting; greenhouses; vehicle washing.

Illinois Graywater Contacts:

- The second document compiled a spreadsheet of institutions across Illinois involved in water conservation, water reuse research, sustainability initiatives, stormwater management, or related pilot projects. This document:
    - Includes universities (UIC, SIUE, ISU, DePaul, Loyola, NIU) and public school districts (e.g., Chicago Public Schools).
    - Shows common areas of focus across institutions:
        - Water conservation and efficiency in buildings and plumbing systems.
        - Stormwater management and green infrastructure.
        - Rainwater harvesting and irrigation improvements.
        - Education and training on water resource management.
    - Serves as a foundation to identify potential partners and collaborators for future sustainable water management efforts and potential regulatory change in Illinois.
- Additionally, attempts were made to identify any Illinois regulatory exceptions allowing graywater reuse for indoor applications (toilet/urinal flushing) but none were found.

Conclusion

Illinois currently does not permit indoor graywater reuse, limiting opportunities for more sustainable water uses on campus. However, other states demonstrate that safe and regulated graywater use, including toilet and urinal flushing, is achievable through clear standards and permitting systems. Within Illinois, many universities, public schools, and research centers are engaged in water conservation and management initiatives, which highlights a potential network of partners for future efforts. Together, these insights provide a foundation for exploring regulatory updates and advancing sustainable water practices on campus and across the state.