

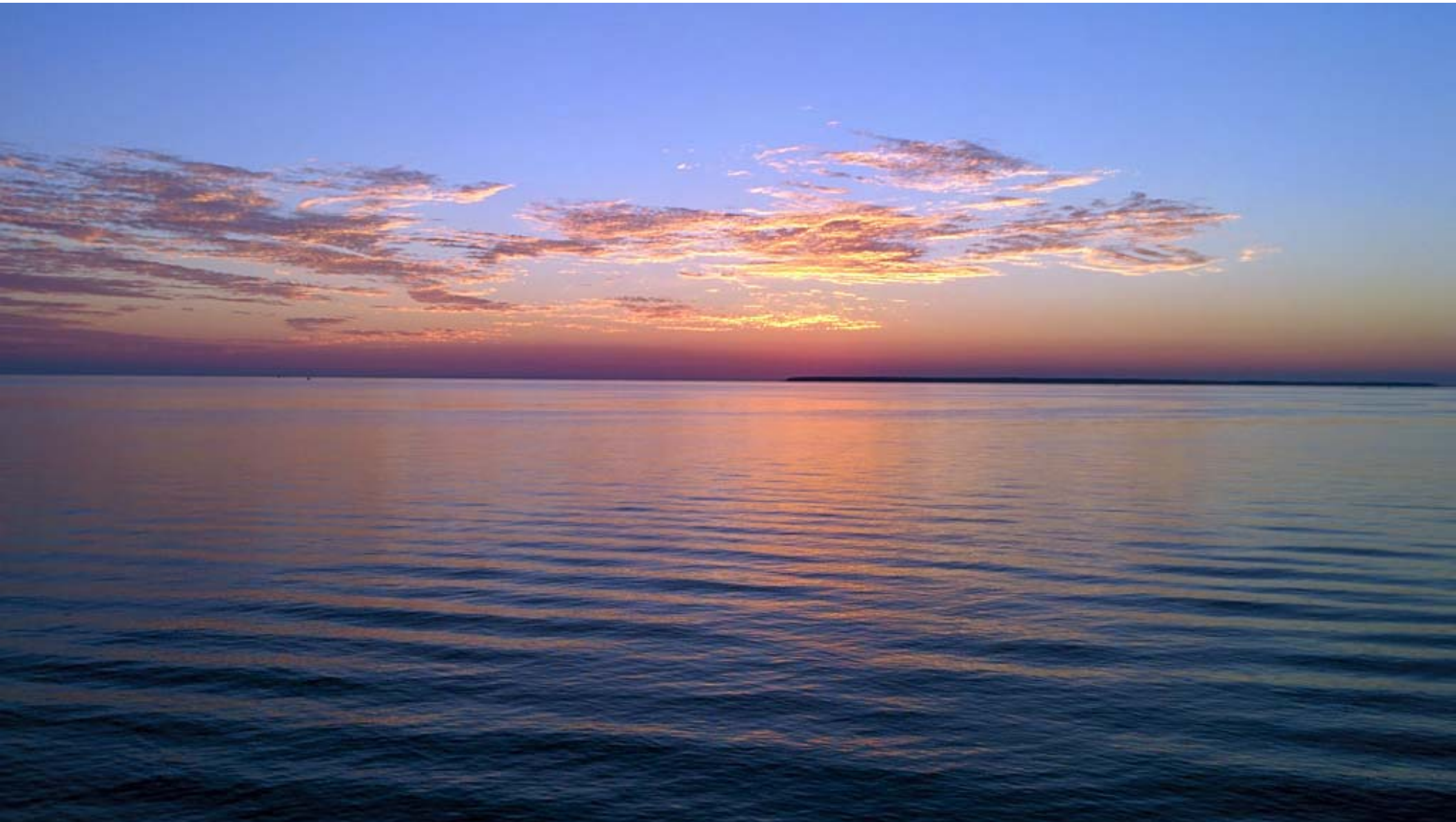


Ottawa County
Where You Belong.

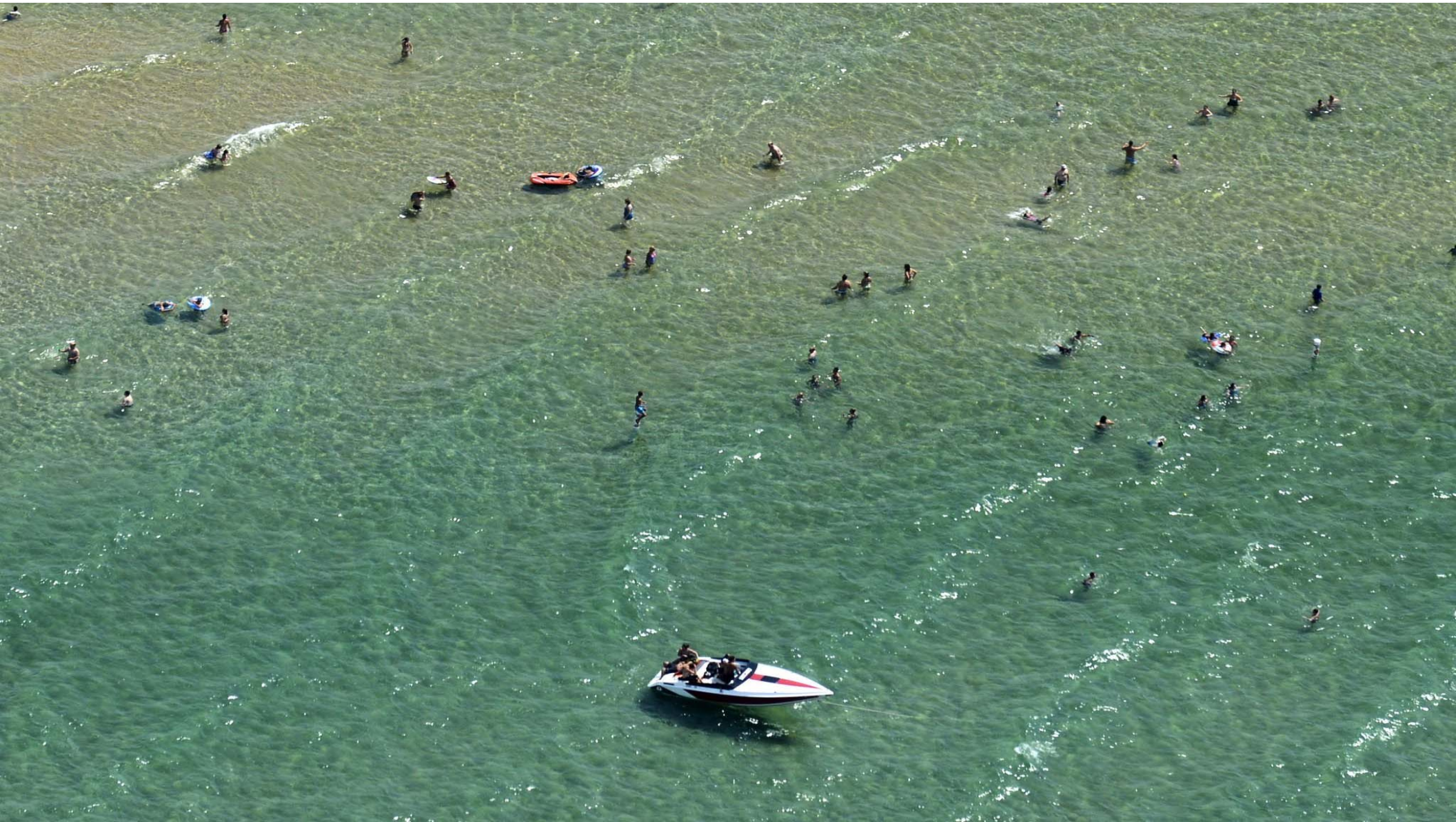
OTTAWA'S WATER PLAN: *CREATE A CULTURE OF WATER CONSERVATION*

Water Quality Forum
November 19, 2018







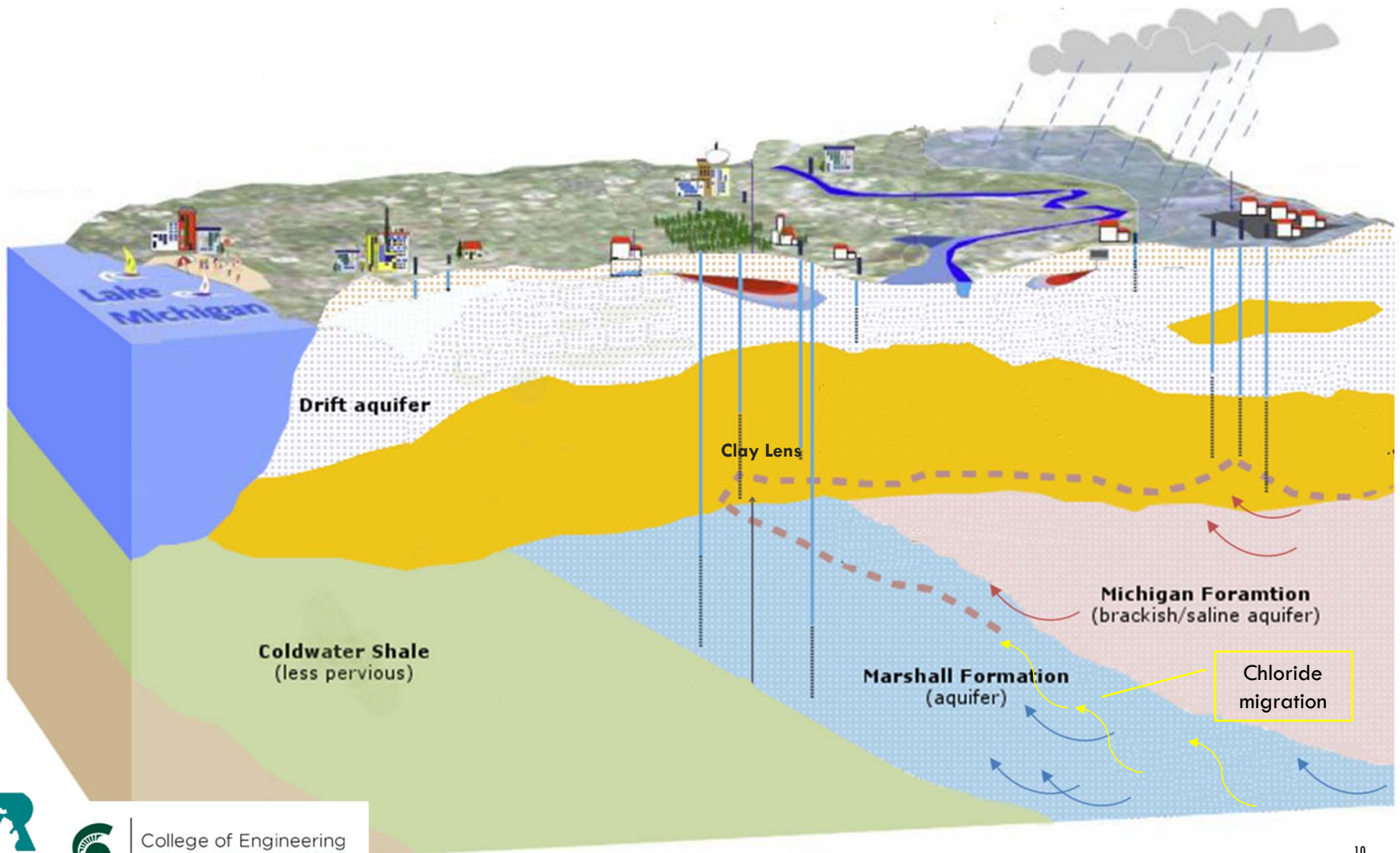




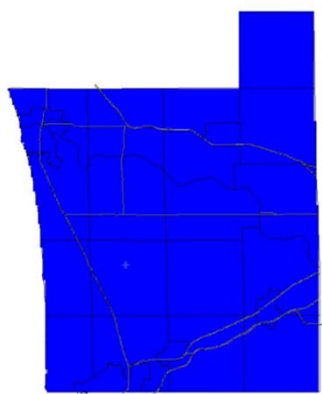




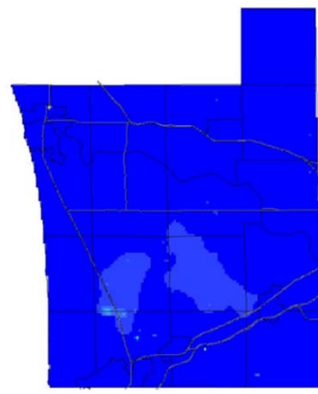




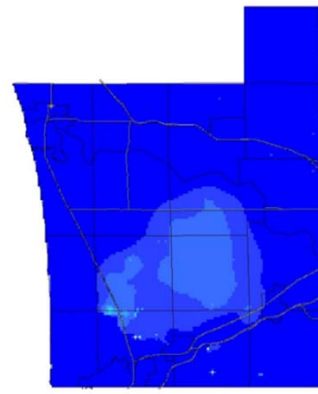
STUDY FINDINGS — CONTINUED DRAWDOWN



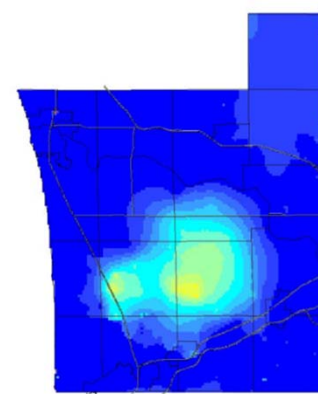
1970



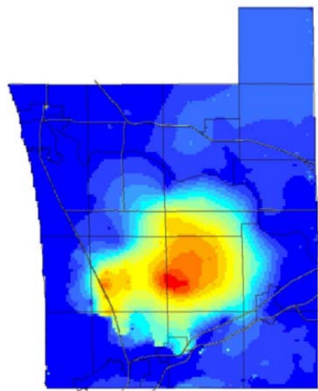
1980



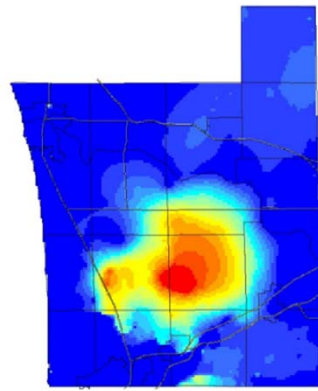
1990



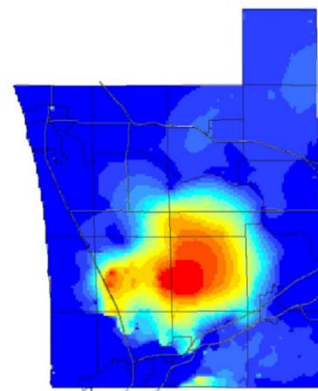
2000



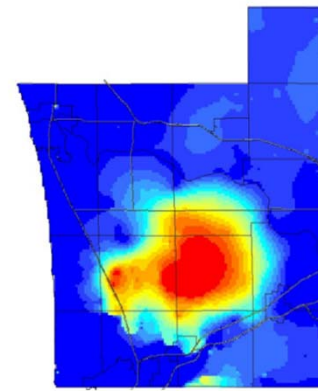
2015



2020

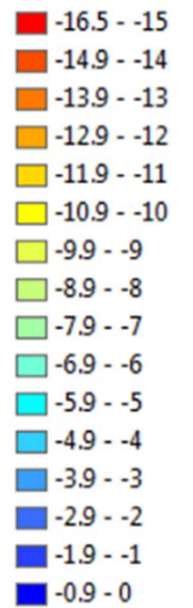


2025

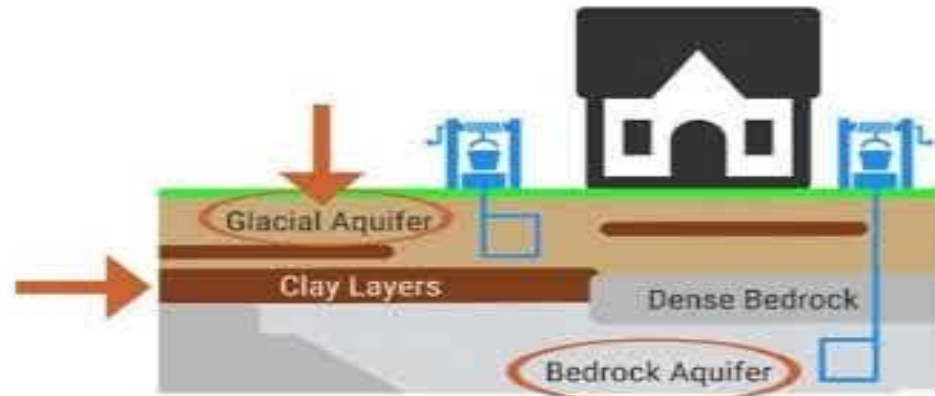


2035

Drawdown (ft.)



What are our groundwater issues?



CREATED USING
POWTOON

OVERVIEW OF WATER PLAN



COMPONENTS OF THE WATER PLAN

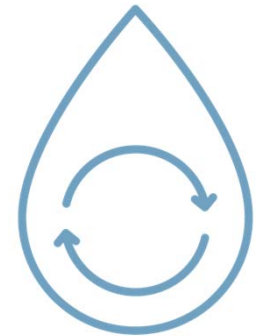
Land Use &
Infrastructure Planning



Education
and Outreach



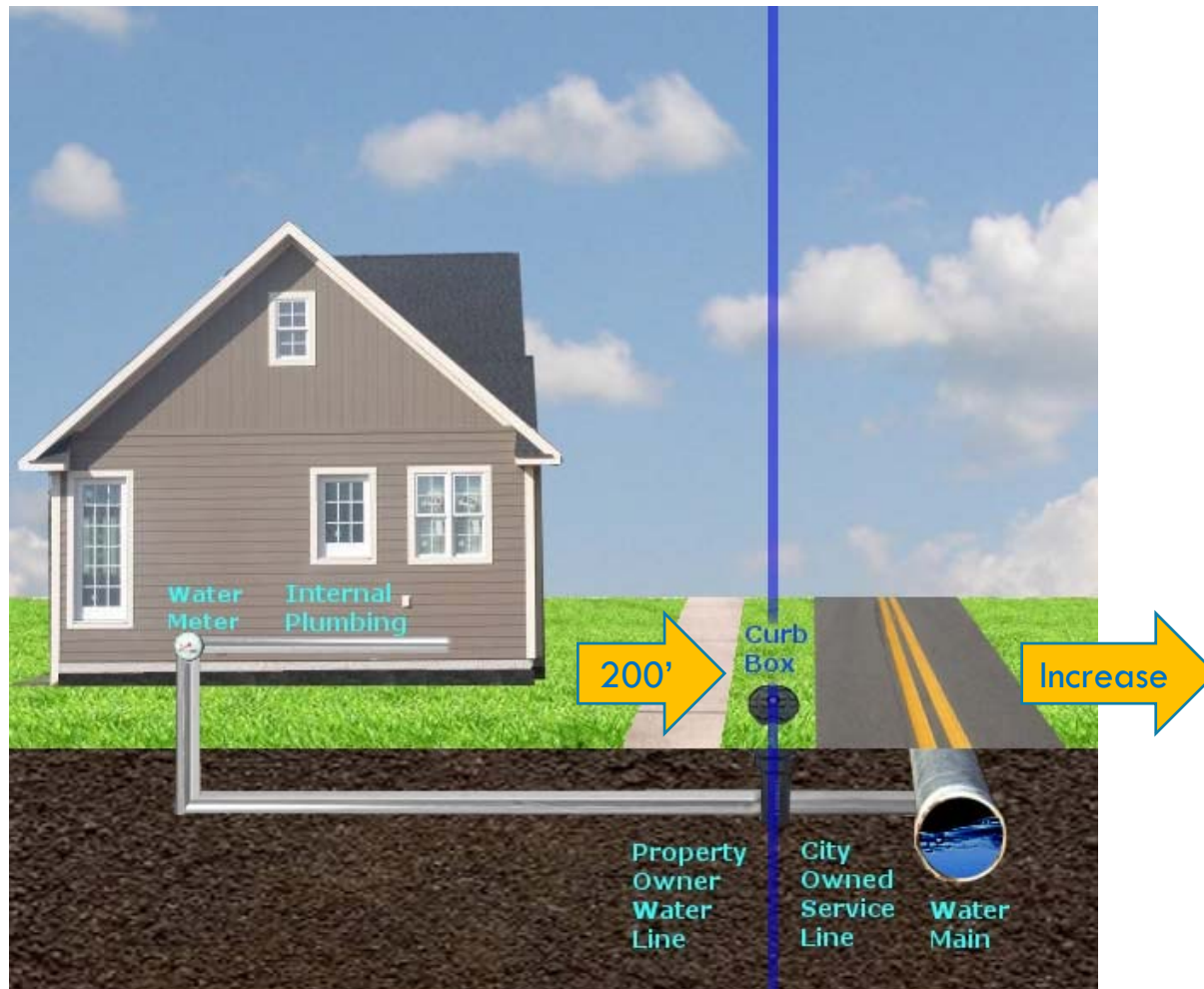
Water Conservation
Implementation



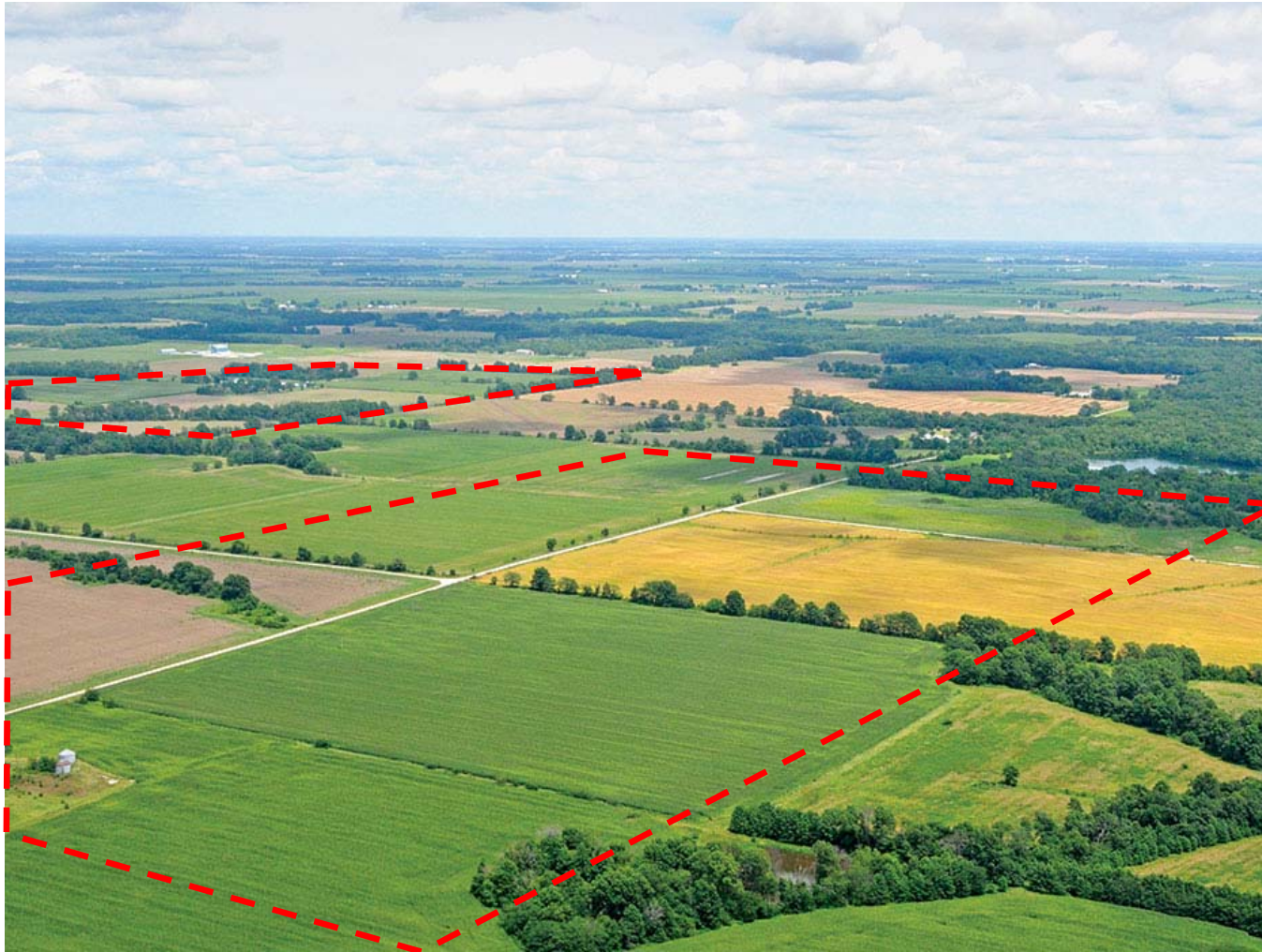
LAND USE & INFRASTRUCTURE PLANNING POTENTIAL STRATEGIES



ADJUST MUNICIPAL SYSTEM CONNECTION STANDARDS



SENSITIVE AREA OVERLAYS (RECHARGE)



SENSITIVE AREA OVERLAYS (RECHARGE)











WATER IS A
VALUE COMMODITY

EDUCATION

+

OPERATE
DIFFERENTLY





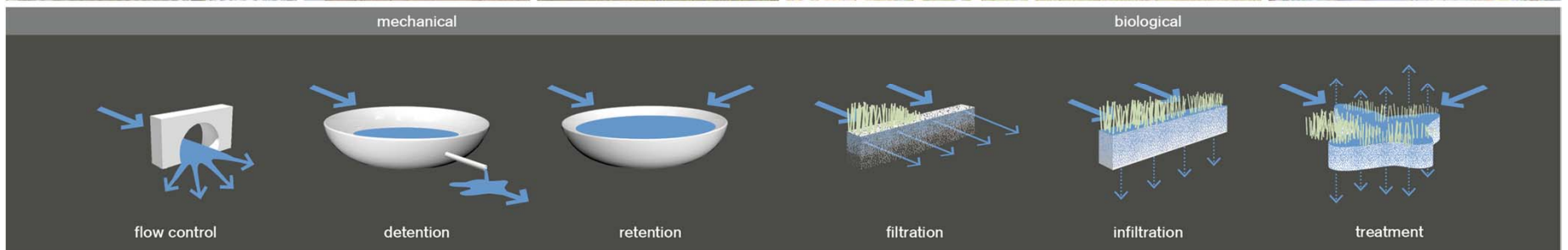


LOW IMPACT DEVELOPMENT STANDARDS



mechanical

biological



flow control

detention

retention

filtration

infiltration

treatment

slow

→ spread

→

flow control: The regulation of stormwater runoff flow rates.

detention: The temporary storage of stormwater runoff in underground vaults, ponds, or depressed areas to allow for metered discharge that reduce peak flow rates.

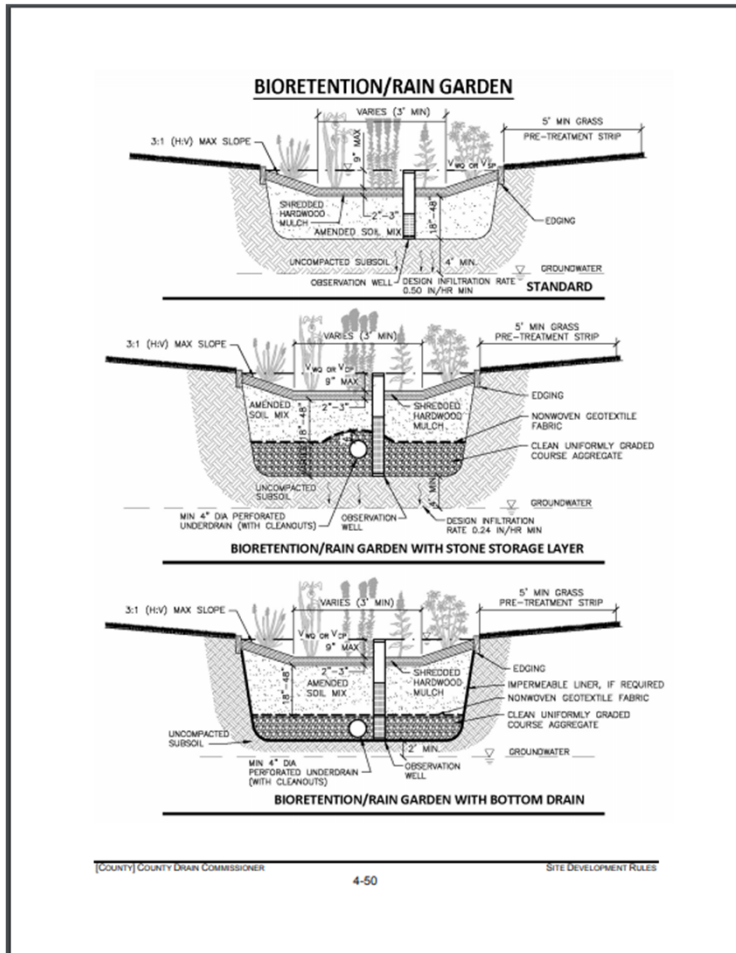
retention: The storage of stormwater runoff on site to allow for sedimentation of suspended solids.

filtration: The sequestration of sediment from stormwater runoff through a porous media such as sand, a fibrous root system, or a man-made filter.

infiltration: The vertical movement of stormwater runoff through soil, recharging groundwater.

treatment: Processes that utilize phytoremediation or bacterial colonies to metabolize contaminants in stormwater runoff.

WATER RESOURCE COMMISSION — SITE DEVELOPMENT RULES (SOON)



**Stormwater Management
Traditional Development versus Low Impact Development**

Traditional Parking Lot Design

LID Parking Lot Design

Traditional "Big Box" Site Layout

Equivalent LID Site Layout

[COUNTY] COUNTY DRAIN COMMISSIONER 1-3 SITE DEVELOPMENT RULES

¹ United States Environmental Protection Agency (December 2007). *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*. EPA 841-F-07-006.

² Maupin, Miranda, and Wagner, Theresa (2003). *Regional Facility vs. On-site Development Regulations: Increasing Flexibility and Effectiveness in Development Regulation Implementation*. City of Seattle, Seattle, Washington.

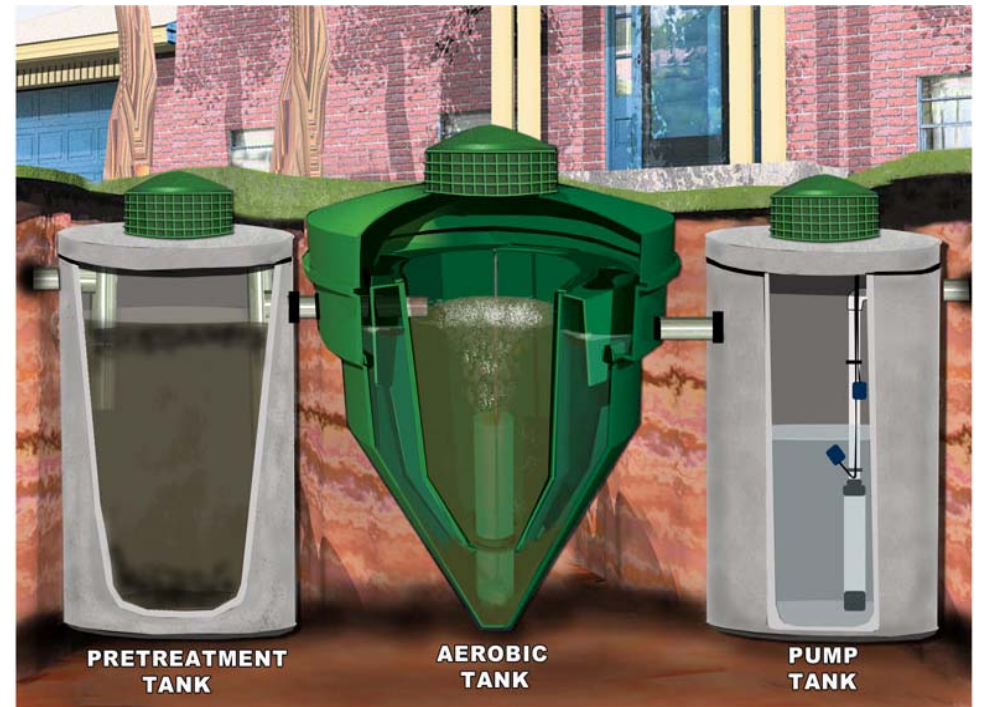
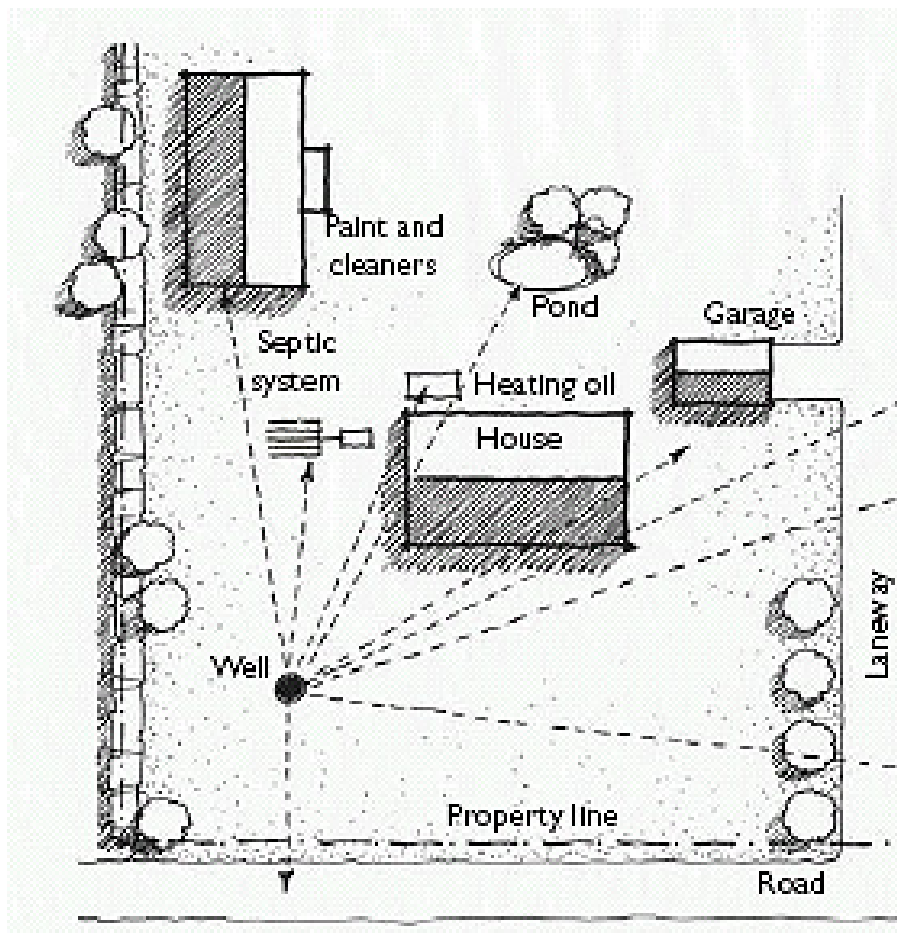
CONCEPTUAL...



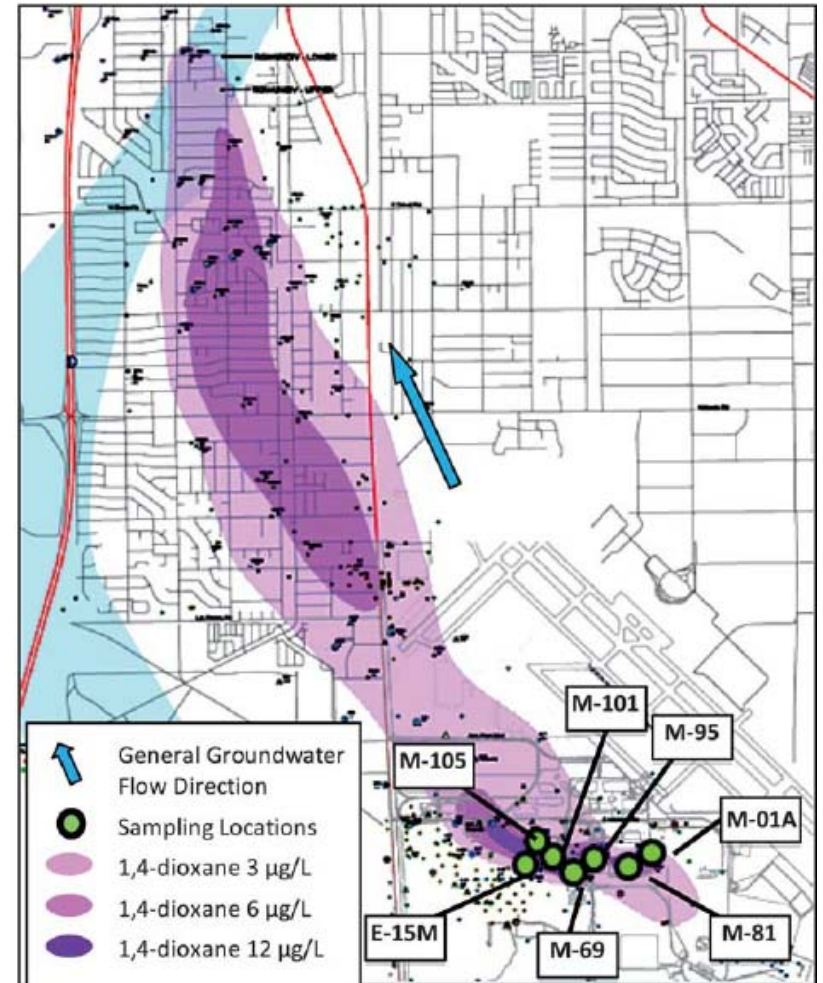
CONCEPTUAL...



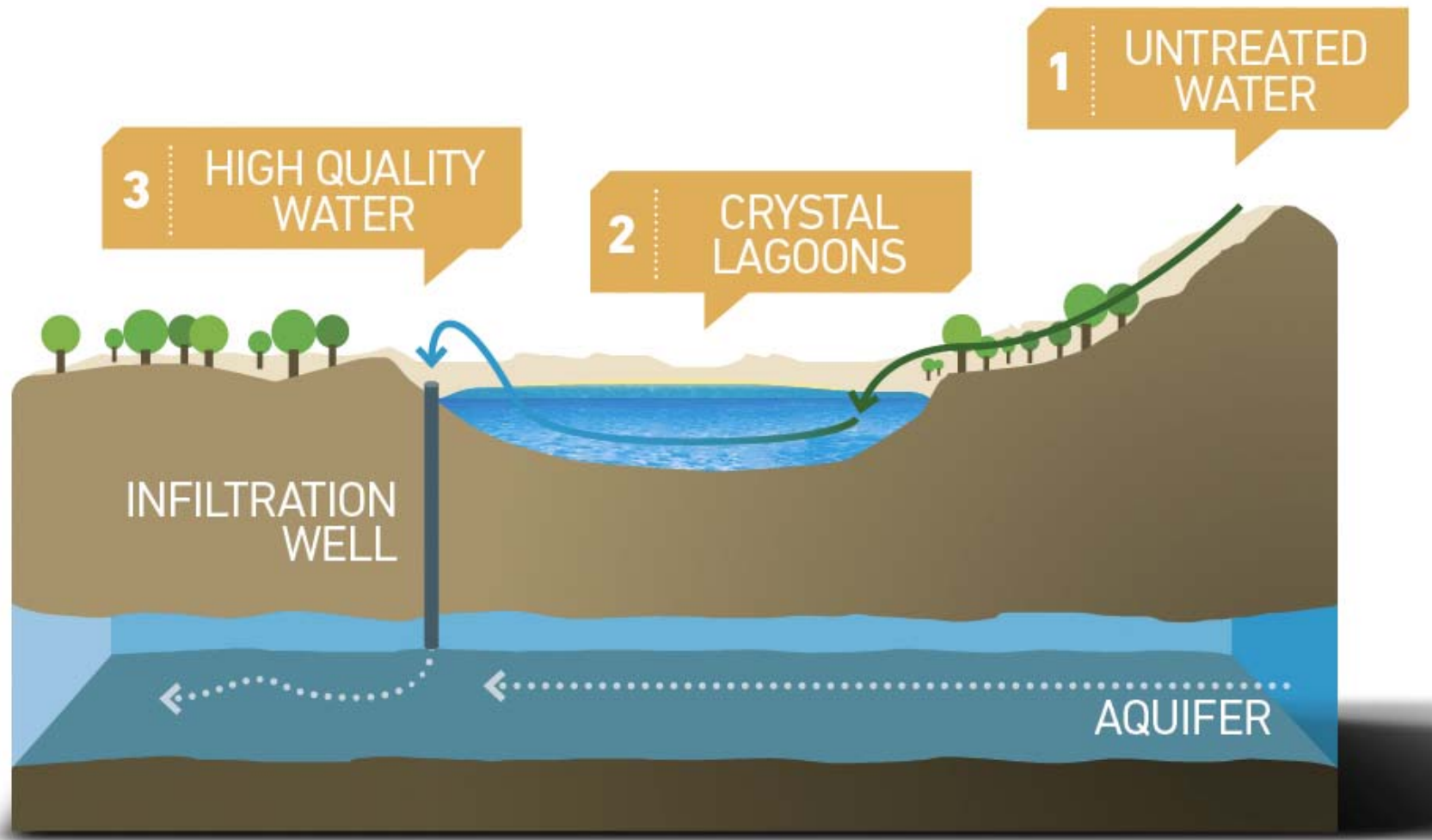
SEPTIC DESIGN AND ISOLATION DISTANCES



DATA-DRIVEN INFRASTRUCTURE PLANNING



BEDROCK INFILTRATION WELL - RECHARGE



GROUNDWATER MONITORING



Static Water Level and Chloride
Trend Monitoring

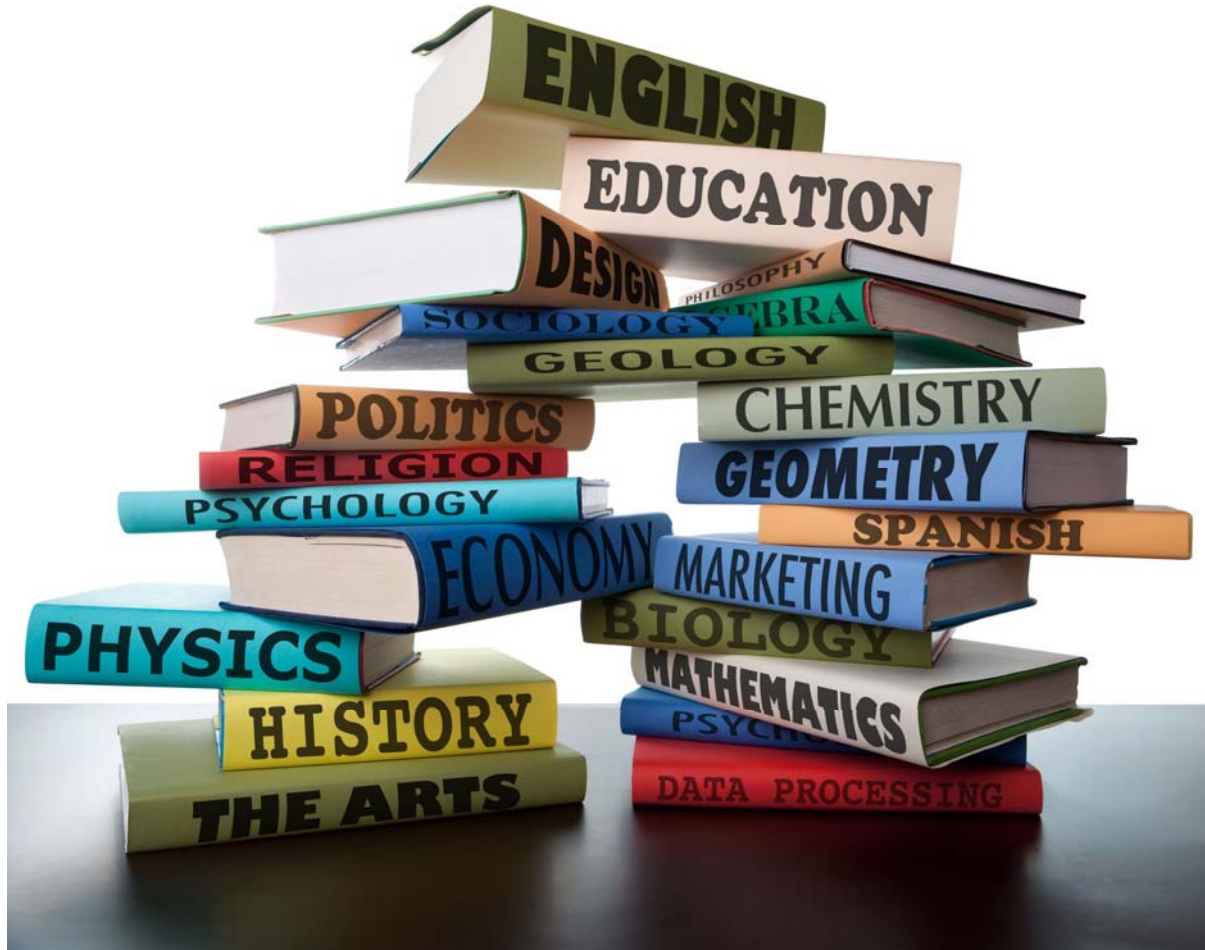


Exploratory Contaminant Testing &
Plume Tracking

EDUCATION & OUTREACH
CHANGING BEHAVIORS
WITH THE HELP OF OUR PARTNERS



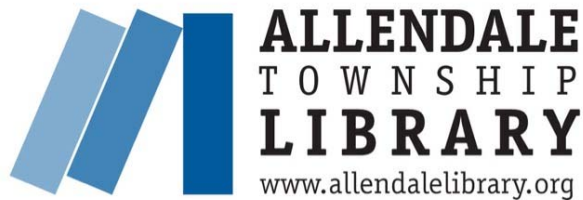
OTTAWA AREA ISD — GROUNDWATER CURRICULUM DEVELOPMENT



OTTAWA COUNTY PARKS — EXHIBITS, INTERPRETIVE SIGNAGE, EVENTS



OTTAWA COUNTY LIBRARIES — EDUCATION EVENTS



Howard Miller Public Library

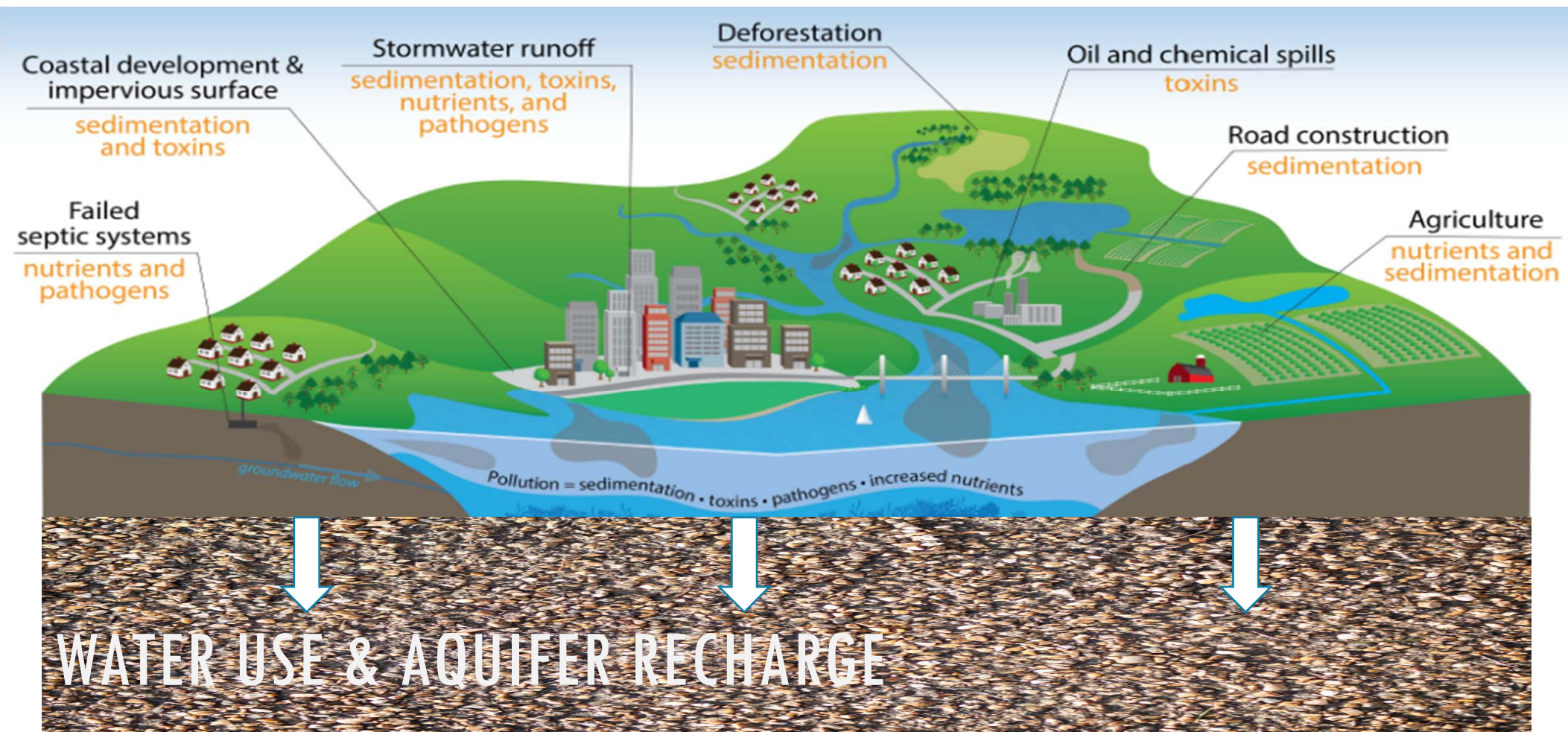
Patmos Library



WATERSHED & ENVIRONMENTAL GROUPS



WATERSHED PARTNERSHIPS



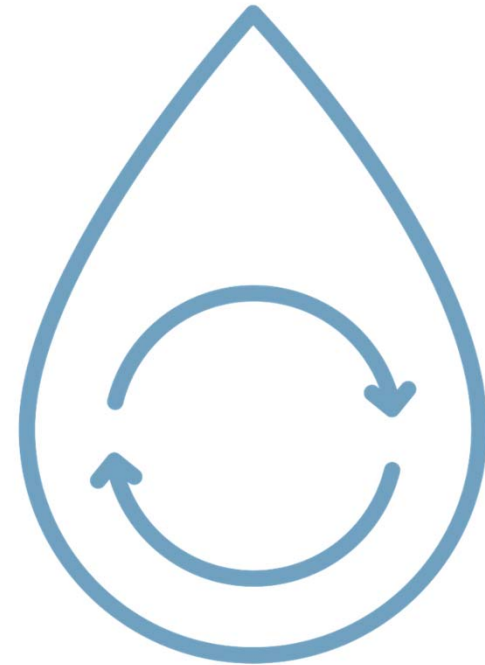
OTHER IN-PROCESS PARTNERSHIPS



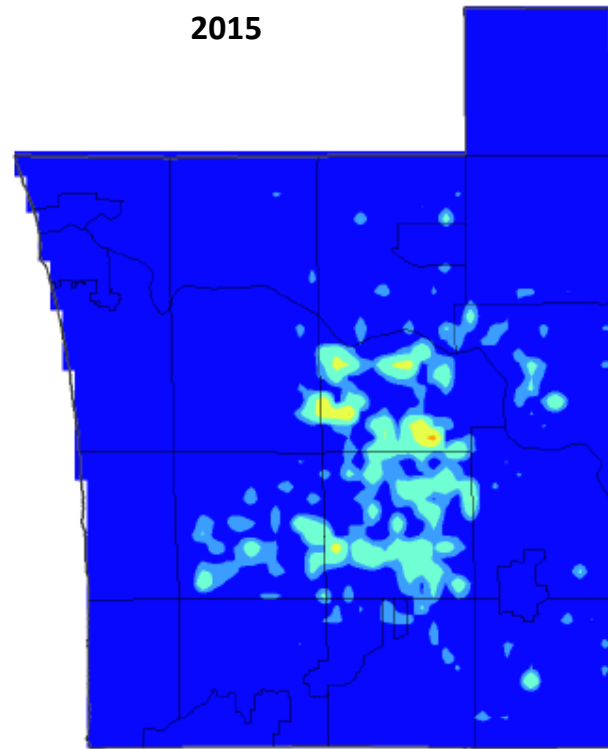
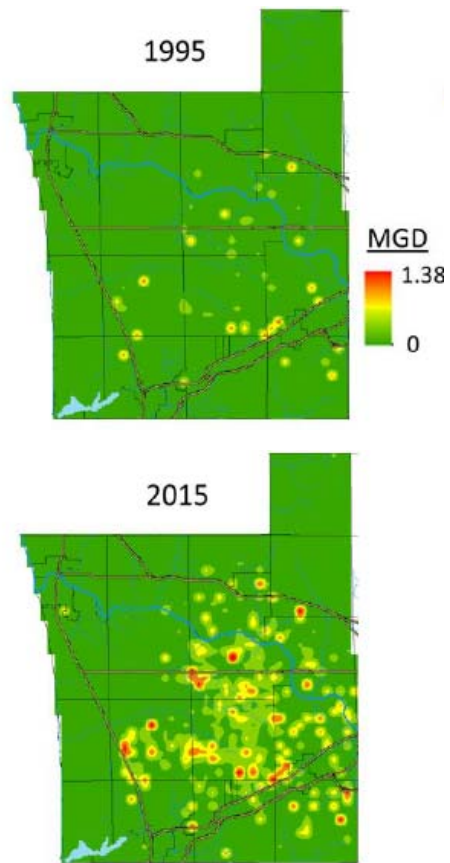
GRAND VALLEY STATE UNIVERSITY — MARKETING CAMPAIGN



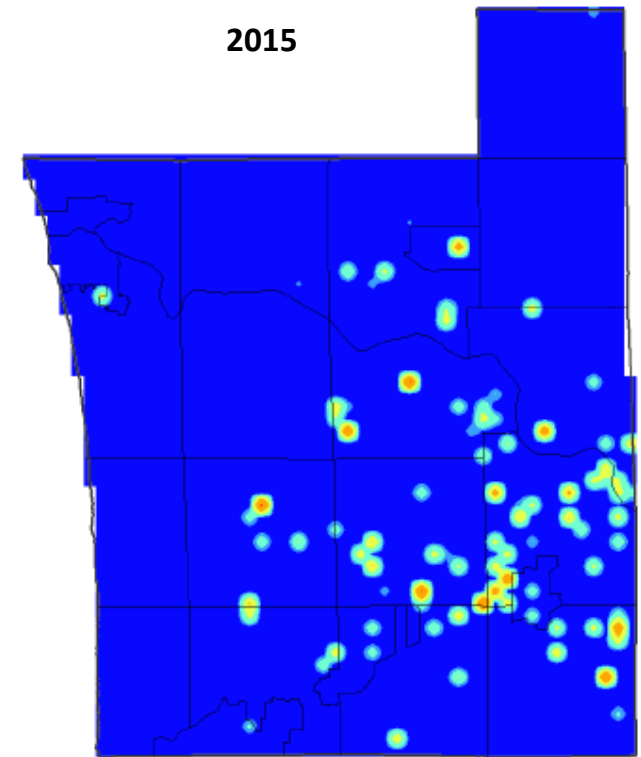
WATER CONSERVATION
ITS TIME TO EMBRACE IT!



BEDROCK WELLS — SPATIAL DISTRIBUTION BY SECTOR



Domestic Wells



Irrigation Wells





TRY XERISCAPING — WITH NATIVE PLANTS



TRY XERISCAPING — WITH NATIVE PLANTS



LET'S COMPETE — LANDSCAPE PLAN PRIZE CONCEPT



HEART SET ON IRRIGATION?



MAXIMIZE STORMWATER



DON'T WATER YOUR LAWN WHILE IT'S RAINING



BE SMART. USE A RAIN GAUGE



GET A FLOW METER



TRY TO SOAK

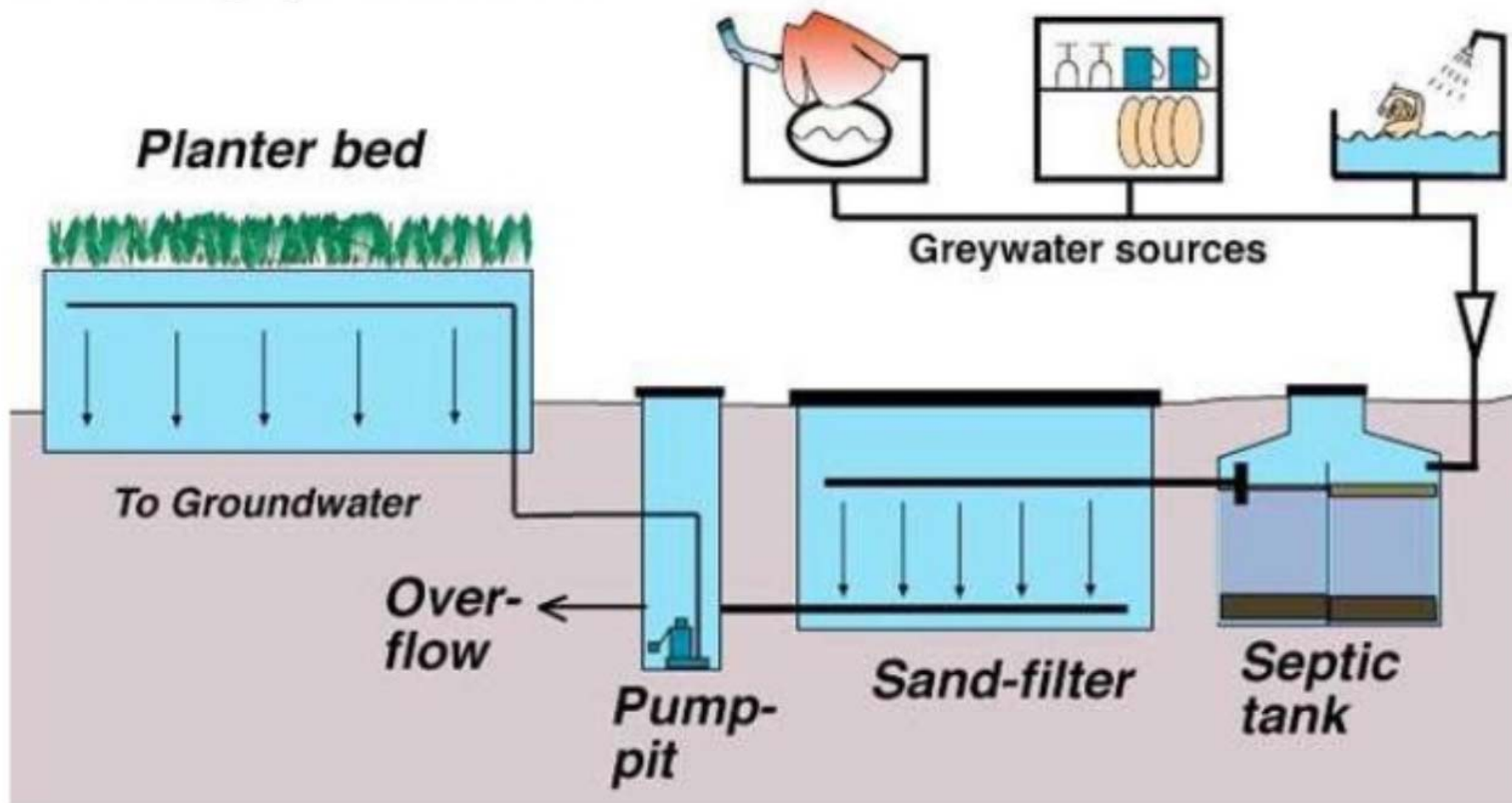


USE RAIN WATER!



GREYWATER REUSE RESIDENTIAL

Advanced greywater treatment





FACILITIES MAINTENANCE — IRRIGATION CONTROLLER



30% reduction in irrigation water usage:

- Weather monitoring
- Flow control
- Remote/Cloud based

GO NATIVE



GREYWATER REUSE COMMERCIAL



FACILITIES MAINTENANCE — TOILET & SINK UPGRADES

- Added electronic controls (to jail toilets)
- Replaced flush devices
- Changed sink aerators



The results:

- 44% reduction in water usage (jail)
- Nearly \$300,000 annual cost savings

WATER RE-USE IRRIGATION



LET'S COMPETE — CERTIFIED BLUE CONCEPT





DON'T LET IT RUN!



LOAD IT UP!



FIX THE DRIP!





5 MINUTE SHOWER CHALLENGE



LOW FLOW FIXTURES



