Cotuit Water Department Irrigation Workshop

- Welcome
  - Please mute your microphones until recognized by the Chair to speak.
  - This session is being recorded and will be posted on the district website.

- Presenters:
  - Scott Horsley, Chairman, Board of Water Commissioners
  - Jack Ahern, Landscape Architect, Umass Amherst
  - Chris Wiseman, Cotuit Water Dept. Superintendent

August 26, 2020 6:30pm

Sustainable Water Management & Lawn Irrigation

ATTENTION
COTUIT RESIDENTS

YOU ARE INVITED TO A PUBLIC WORKSHOP
(ZOOM ON-LINE)

AUTOMATIC IN-GROUND IRRIGATION CONNECTION MORATORIUM

AUGUST 26, 2020 6:30 PM

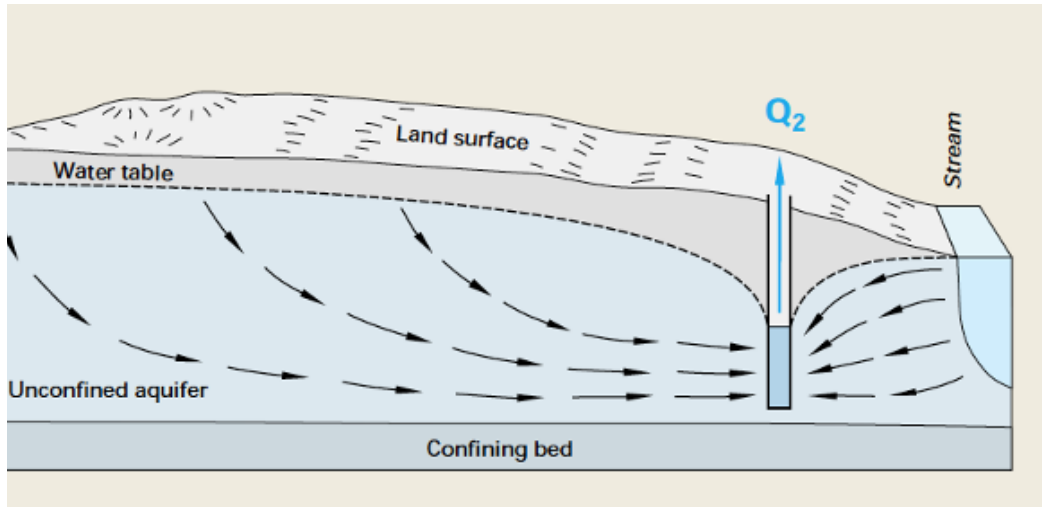
ZOOM MEETING ID: 825 7827 7242
ZOOM MEETING URL:
https://us02web.zoom.us/j/82578277242

"On July 15th, the Cotuit Water Commission voted to extend the moratorium on new connections to the Cotuit drinking water supply for automatic, in-ground irrigation systems until October 20, 2020. The purpose of the temporary halt is to enable the Commission to review a series of proposals and seek public input on suggestions to discourage the use of the public drinking water system for lawn irrigation.

This moratorium does not affect new hook-ups for in-home water distribution. It also does not affect existing in-ground irrigation. The Commission is concerned that natural water bodies, especially streams and freshwater wetlands in Cotuit, are being impacted by excessive well drawdown during the peak demand months in the summer. Water quality in the distribution system can also be impaired by excessive drawdown near wetlands, such as by manganese and iron infiltration.

Among the items which the Commission is exploring are a permanent ban on new irrigation connections, water-saving devices and methods for irrigation, required inspections on irrigation systems, separate metering, premium pricing, eventual disconnections, and fertigation wells.

We hope that Cotuit ratepayers will participate in our workshop and learn more about these ideas with the Commission. We are interested in your thoughts and ideas. Please see our website and Facebook page for more information."



Cotuit Fire District
Cotuit, Massachusetts
Water Department

Enabling and Governing Laws

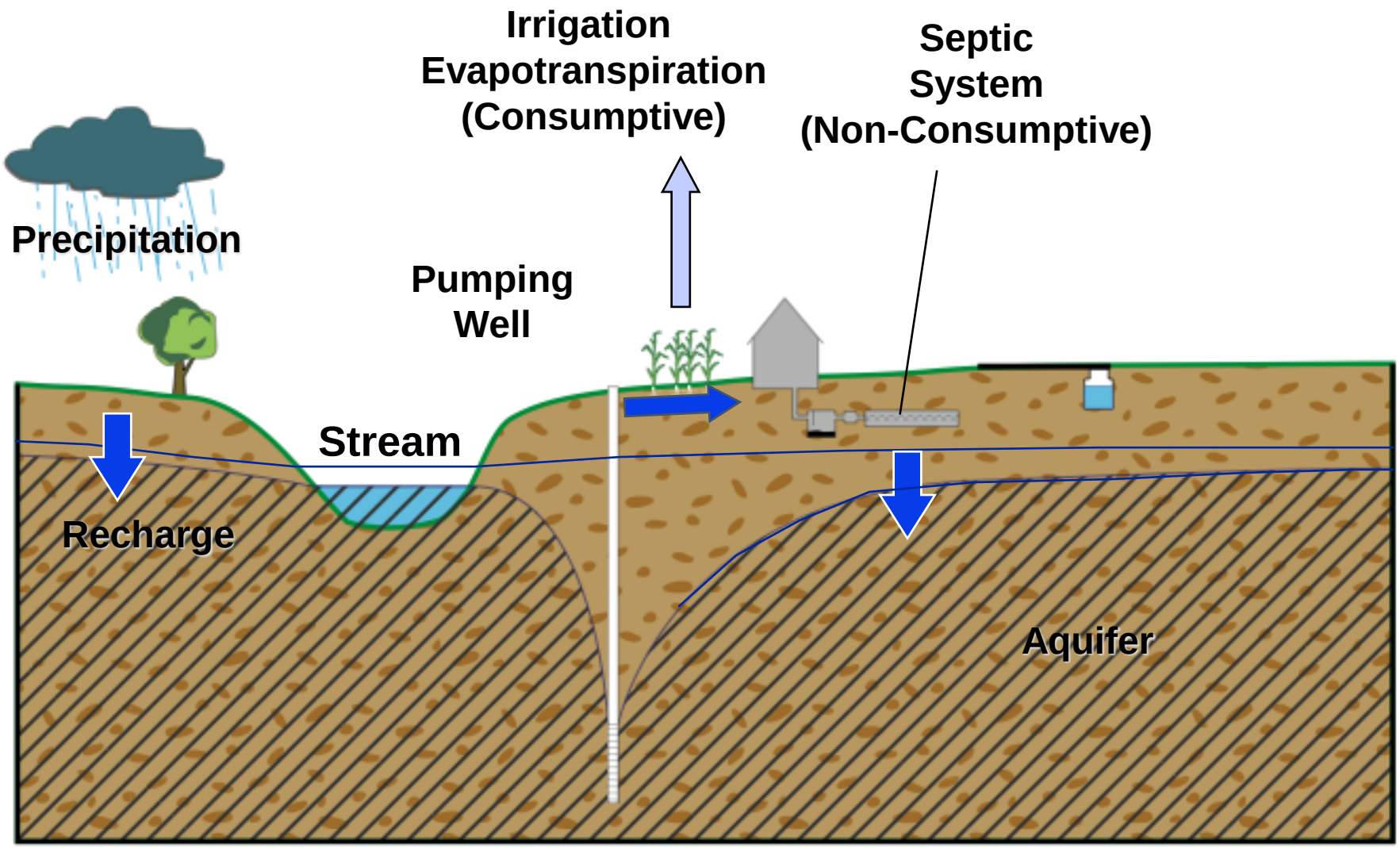
- 1935 Legislation creating Cotuit Fire District “to supply itself and its inhabitants with water for the extinguishment of fires and for domestic use.”

- 1972. MA Wetlands Protection Act “No person shall remove, fill, dredge or alter any bank, riverfront area, fresh water wetland, coastal wetland, beach, dune, flat, marsh, meadow or swamp bordering on the ocean or on any estuary, creek, river, stream”

- 1974 Safe Drinking Water Act “was established to protect the quality of drinking water in the U.S. This law focuses on all waters actually or potentially designed for drinking use, whether from above ground or underground sources”.

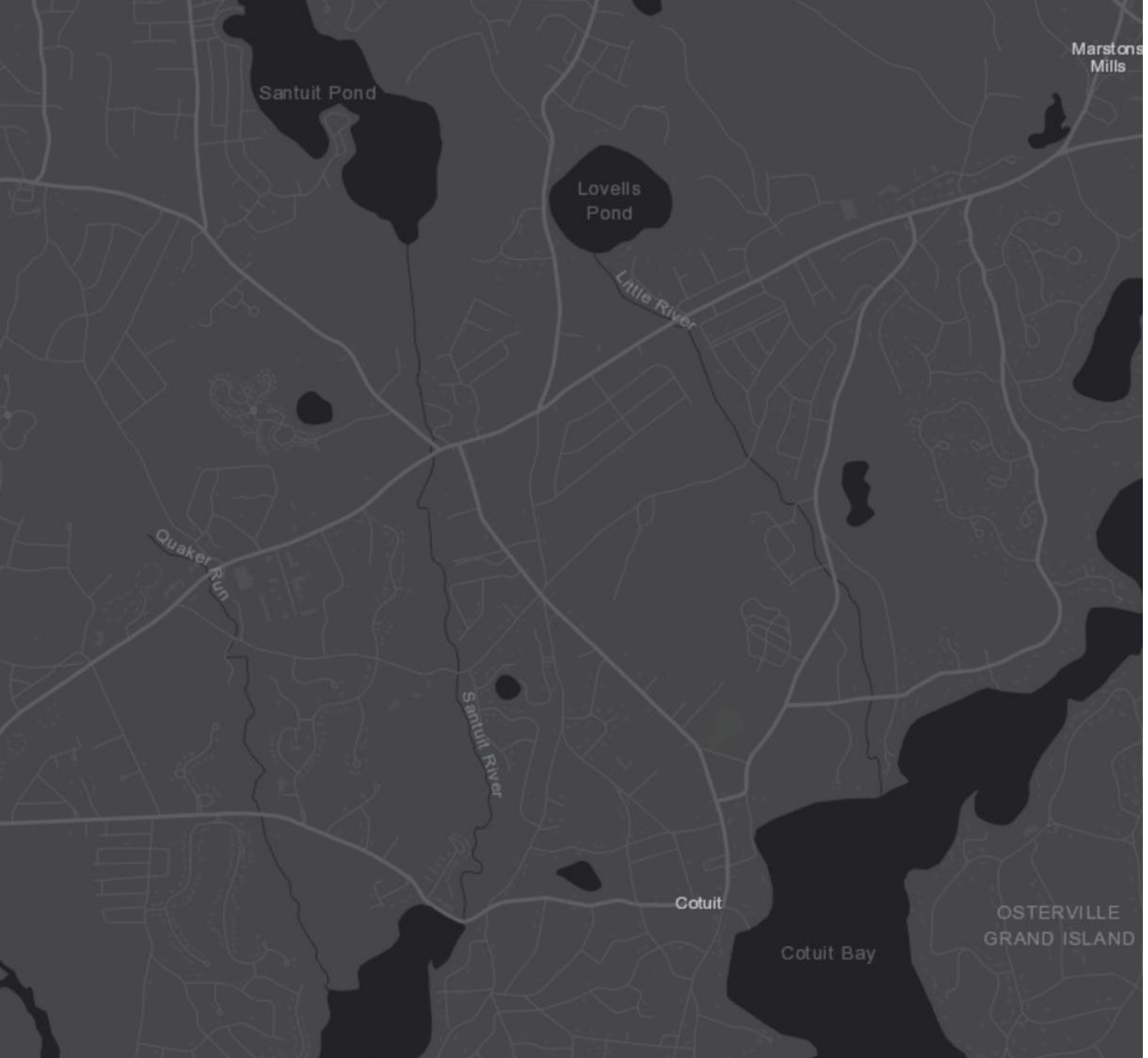
- 1988 MA Water Management Act & 2017 Sustainable Water Management Initiative “The Commonwealth’s water resources are public resources that require sustainable management practices for the well-being and safety of its citizens, protection of the natural environment and for economic growth”

Hydrologic Budget



What is the value of freshwater flow to the ocean?

- *“Fresh water streams, marshes and estuaries combined with the clean water entering from Nantucket Sound provide our oysters with a rich food supply”* – Cotuit Oyster Company



Cotuit Bay Water Quality Restoration

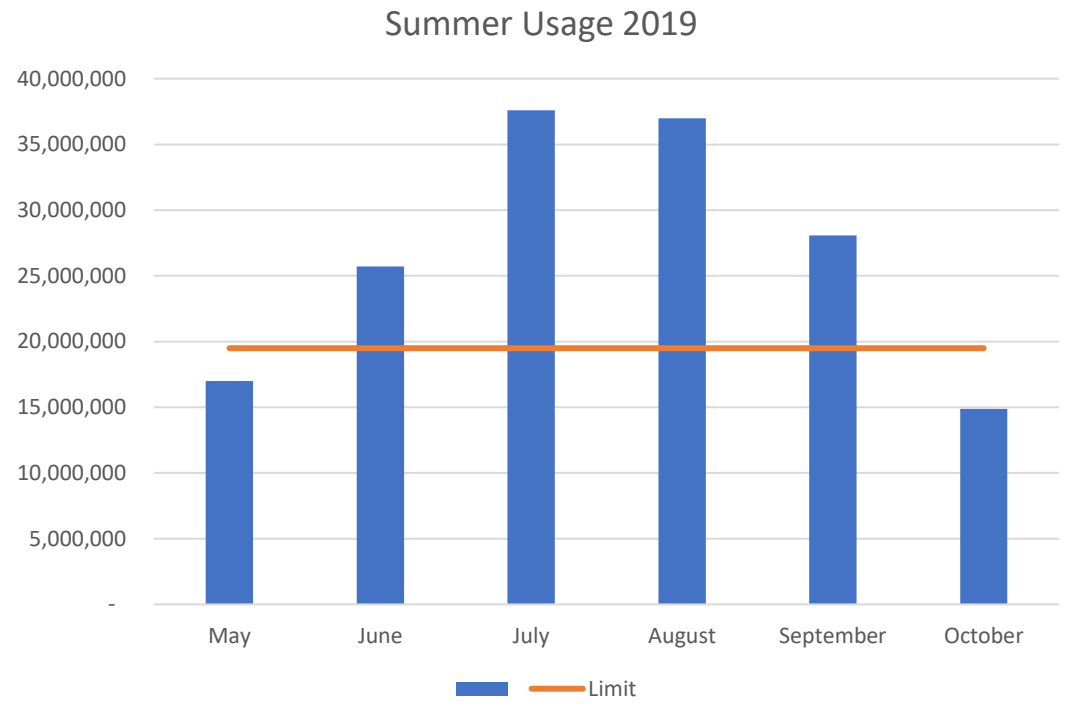
- less nutrients (pollution)
- more fresh water (dilution)

our water supply source is groundwater that also provides freshwater discharge to wetlands, streams, and estuaries (bays)

Lawn Irrigation = doubles water pumping
during summer months and is a ”consumptive use”

Cotuit
Fire District
Cotuit, Massachusetts
Water Department

Water Withdrawal Permit = 19,500,000 (monthly)
Summer Months Consumption Excess



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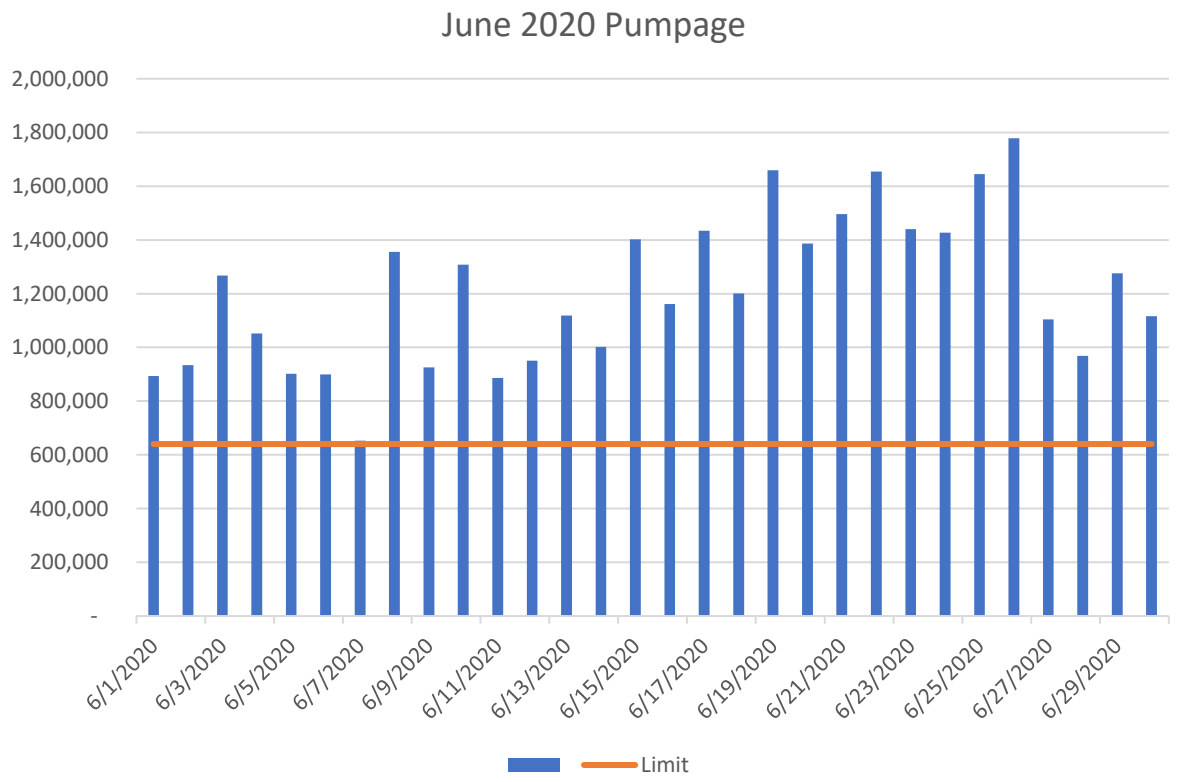
Cotuit, Massachusetts
Water Department

Water Withdrawal Permit = 640,000 (daily)
Summer Month Consumption Excess



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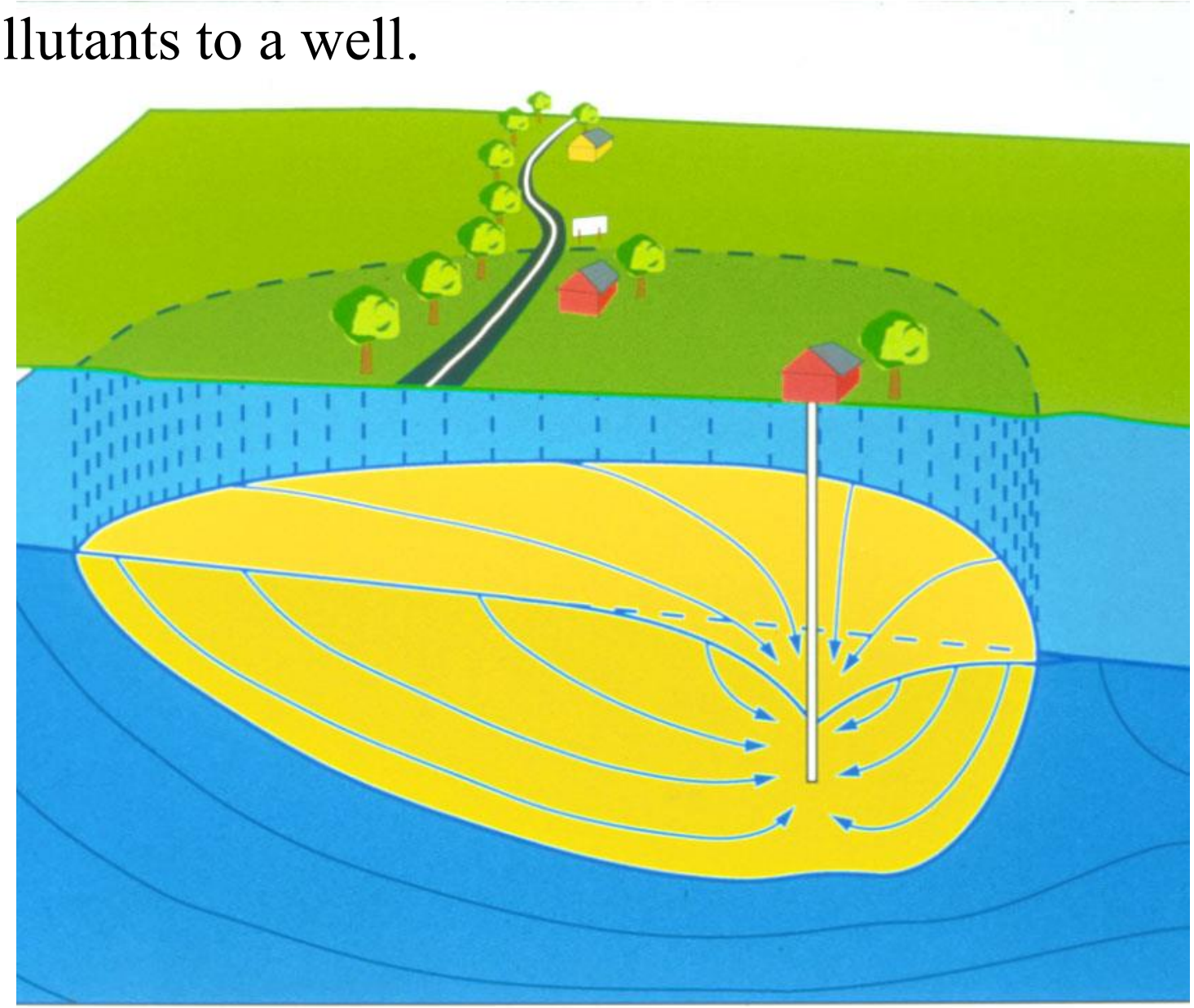
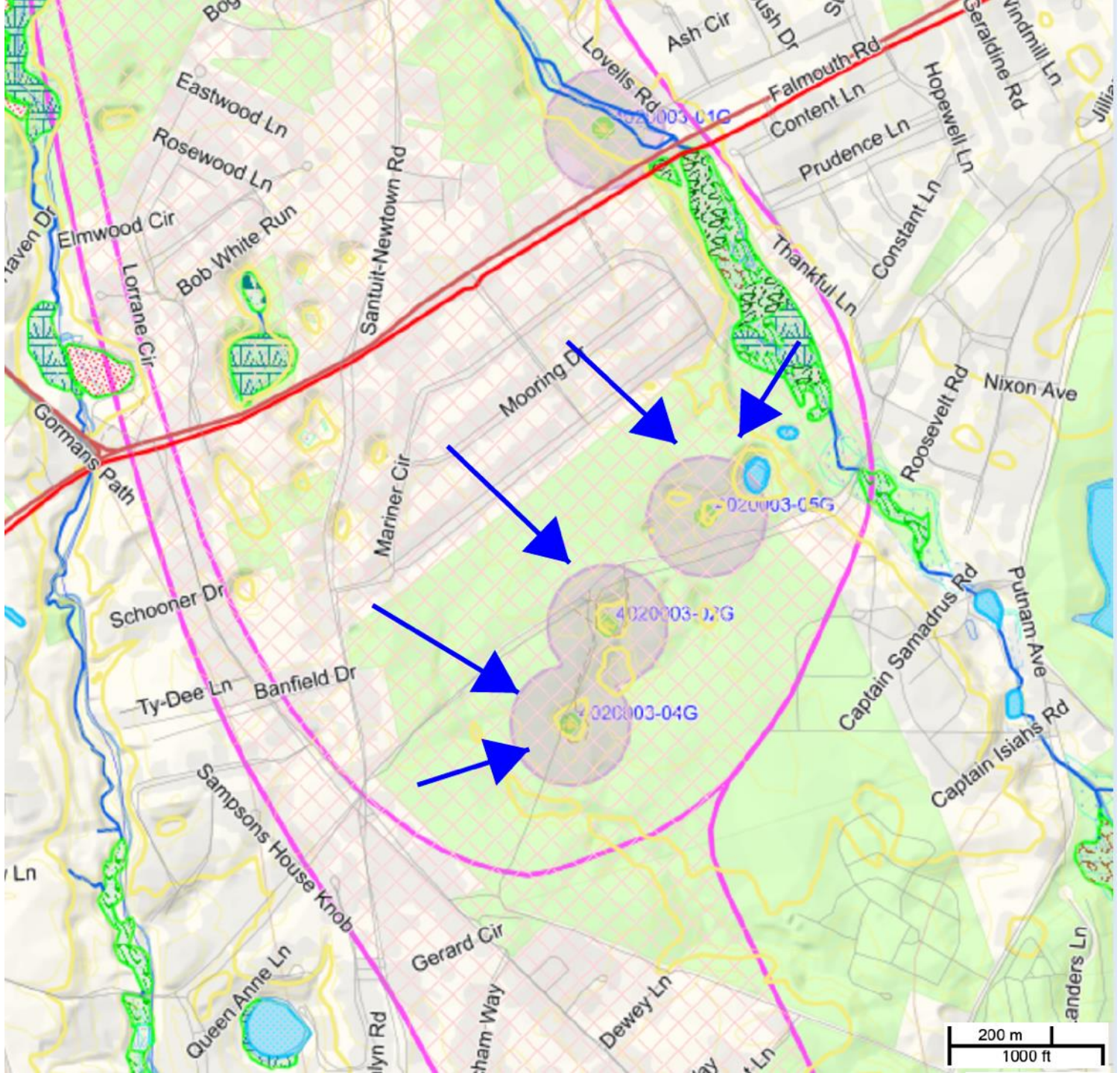
Cotuit, Massachusetts
Water Department

Zone 2 – Wellhead Protection Area Under Maximum Pumping Rates

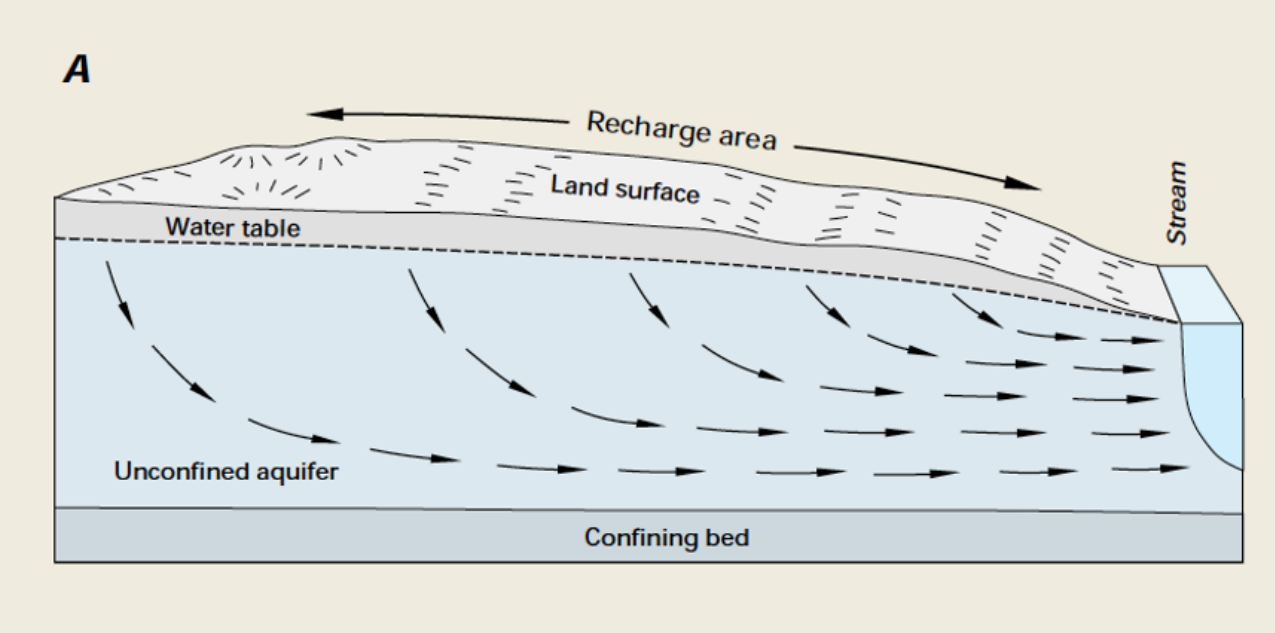
Cotuit Fire District
Cotuit, Massachusetts
Water Department

Wellhead Protection Area = that “area” that contributes water and potentially pollutants to a well.

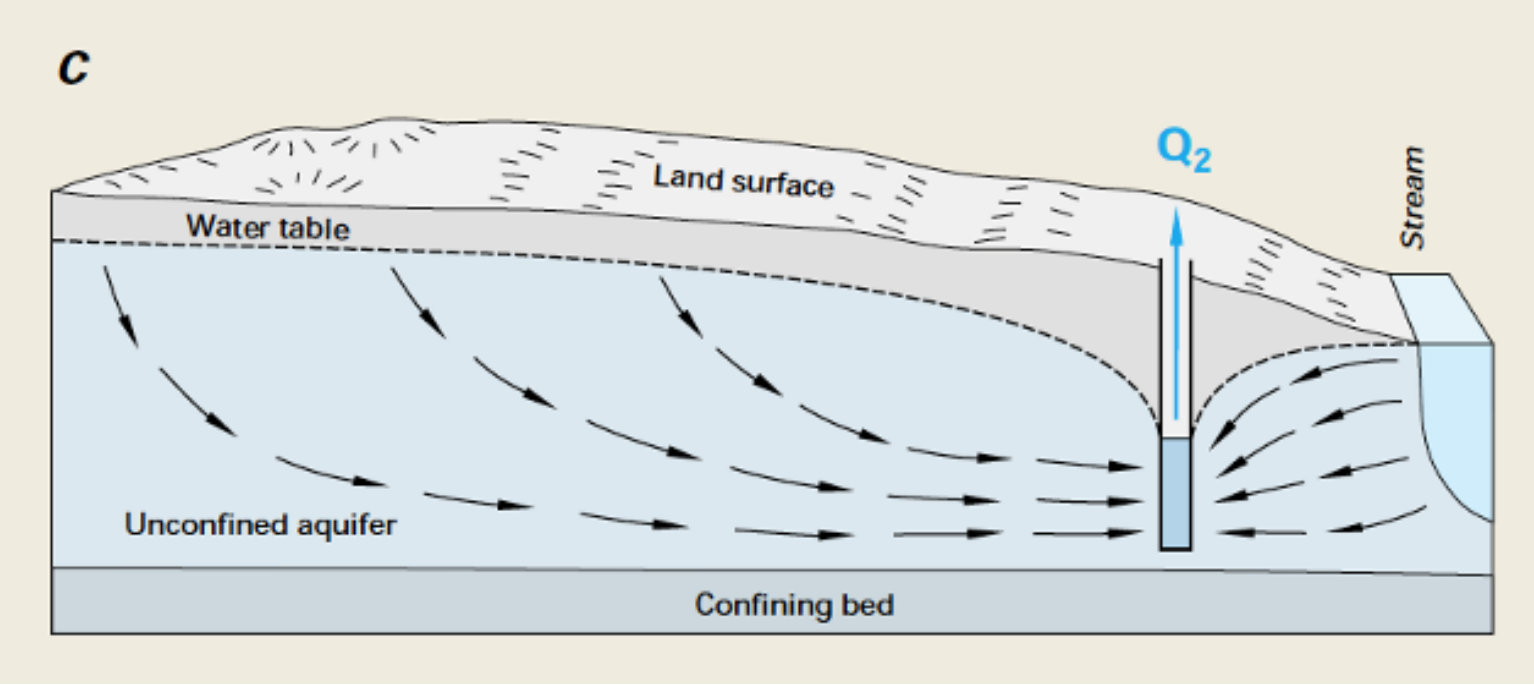




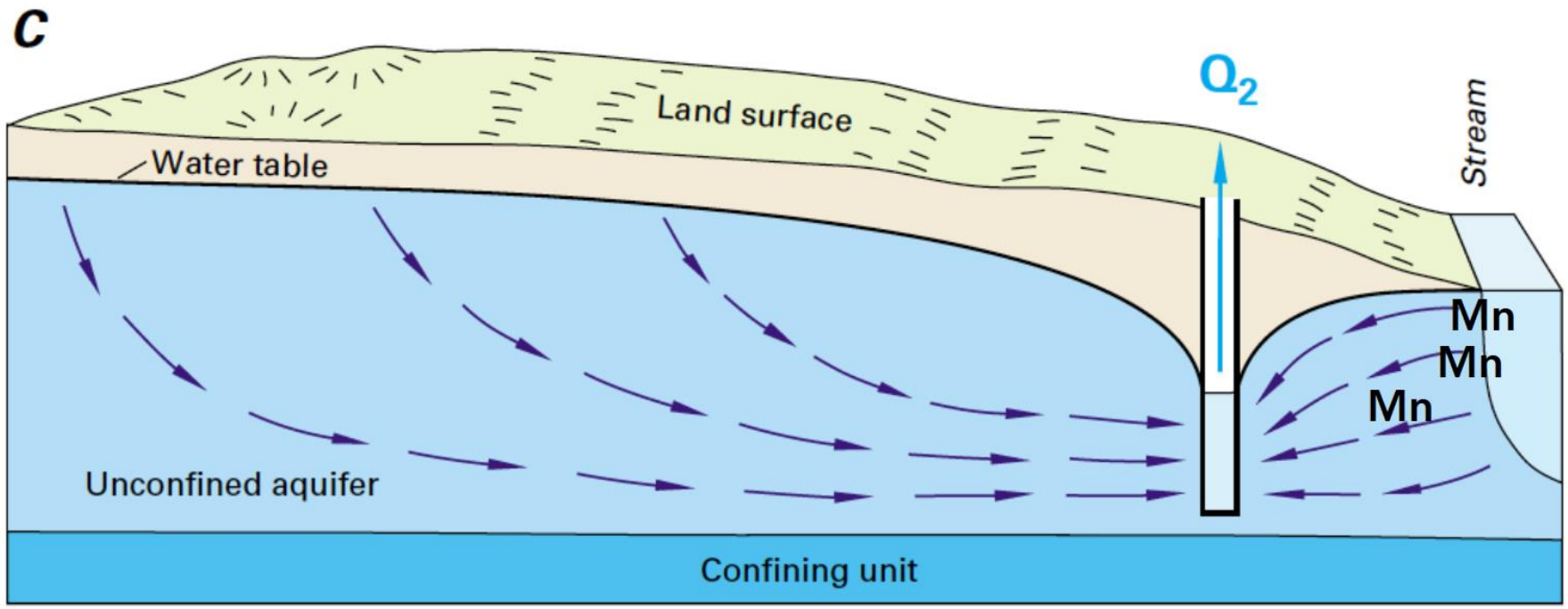
At maximum summer pumping well draws water from Little River and Wetlands



Natural conditions



Pumping conditions



summer pumping de-waters Little River and
can mobilize Manganese (Mn) from the wetland soils

Estimated Cost of Manganese Treatment = $10 million

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Cotuit, Massachusetts
Water Department

Photographs of Little River during summer
Courtesy Commissioner Mark Robinson
(Robinson for scale)

Options to Reduce Irrigation Water Consumption

1. Improve irrigation efficiency (smart systems)
2. Alternative landscaping (less lawn/less irrigation)
3. Private on-lot irrigation/fertigation wells

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Cotuit, Massachusetts
Water Department

Higher Efficiency “Smart” Irrigations Systems

- Includes rain sensors and computerized controllers
- Need inspection replacement every three years
- Estimated water savings potential = 33% of irrigation and 16% of peak summer pumping
- (if all existing systems are retrofitted, maintained, inspected, and operated correctly)

Alternative landscaping

Xeriscaping = less or no irrigation requirement

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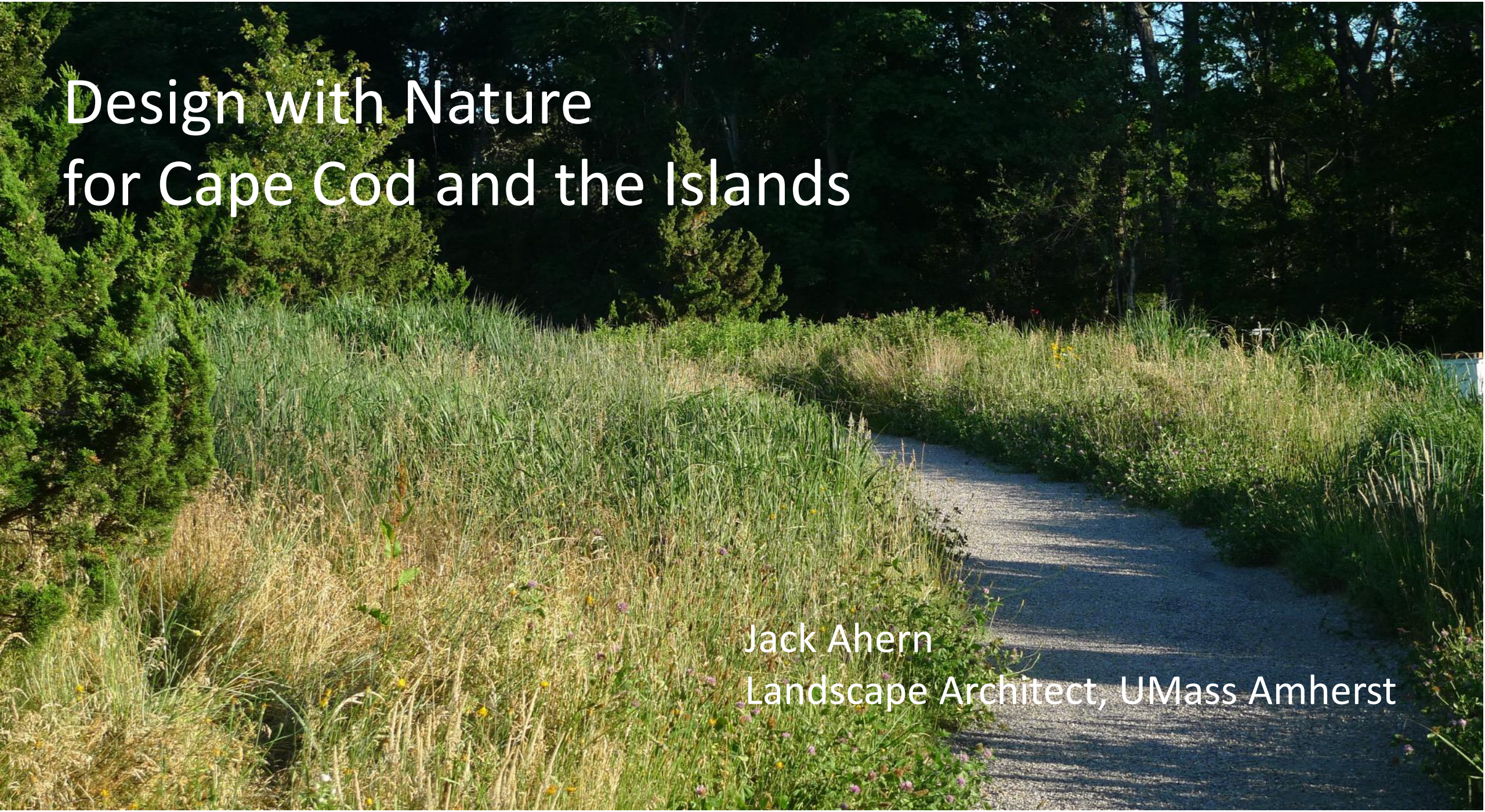
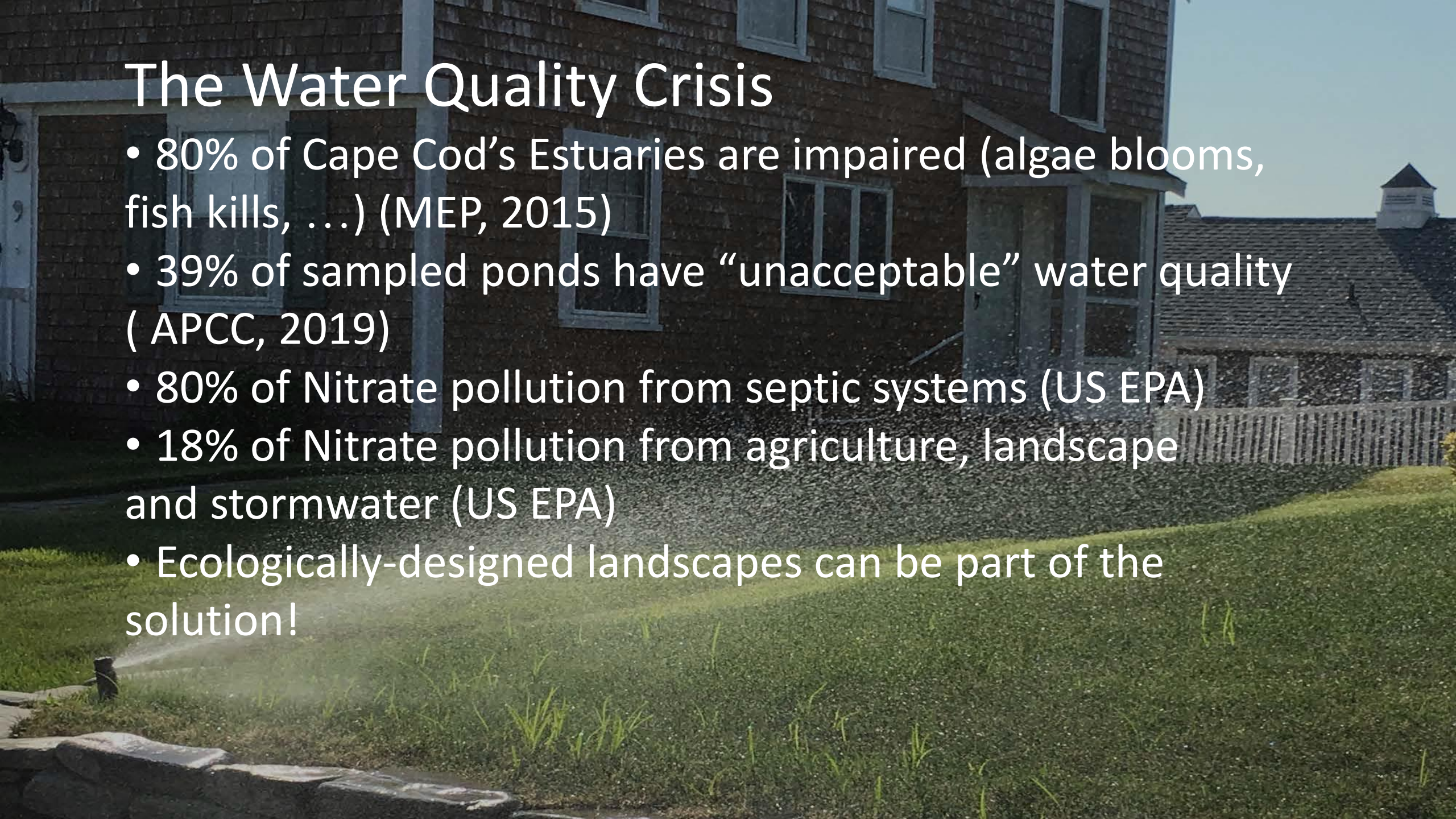
Design with Nature for Cape Cod and the Islands



Jack Ahern
Landscape Architect, UMass Amherst



The Water Quality Crisis

- 80% of Cape Cod's Estuaries are impaired (algae blooms, fish kills, …) (MEP, 2015)
- 39% of sampled ponds have "unacceptable" water quality (APCC, 2019)
- 80% of Nitrate pollution from septic systems (US EPA)
- 18% of Nitrate pollution from agriculture, landscape and stormwater (US EPA)
- Ecologically-designed landscapes can be part of the solution!

The Lawn “Habit”

“We spend our money and our resources and our time cultivating our carpets of green not just because we want to, but because we are expected to” . Megan Garber, 2015

Over 27,000 acres of residential and commercial turf on Cape Cod – not including golf courses – Over 5000 acres in the Town of Barnstable (Cape Cod Commission, 2014).

Conventional lawn maintenance : irrigation, fertilizer and chemical weed and pest controls.

The sandy and gravely soils found on Cape Cod and the Islands allow water and a portion of dissolved fertilizers and pesticides to move relatively easily from the soil surface into the groundwater (Borman et al 1993, p. 108).

“Lawns are a nationwide chemical experiment with homeowners (and the environment) as the guinea pigs” . Ted Steinberg, 2006

Lawn Best Management Practices*

First, REDUCE LAWN AREA! Maintain a “no-lawn” minimum 100’ buffer from any water or wetlands.

Second, follow “Best Practices” to maintain “Cape-and-Islands-friendly” smaller lawns:

1. Test soil, (soiltest.umass.edu),
2. **Fertilizer.** Reduce fertilizer use and comply with Massachusetts and Cape and Islands’ fertilizer regulations.
3. **Mowing.** Mow lawns high (2”-3”), generally at your highest lawn mower setting.
4. **Irrigation.** Don’t over irrigate, don’t keep soil at field capacity. Use drought- resistant turfgrass species (tall fescue is best for dry soils). If irrigating, monitor rainfall.
5. **Weed managemen**t. Observe/scout lawn weed species. Pull or spot-treat weeds rather than using broadcast herbicide treatment.
6. **Overseed**, as needed, best in late summer w/Cape-and-Islands-Friendly turfgrasses (fine and tall fescue and perennial rye

Third, Consider converting (a part of) your lawn to a “lawn alternative”

.

*BEST MANAGEMENT PRACTICES FOR LAWN AND LANDSCAPE TURF, version 1.51 UMass Extension, 2016.

Turf Irrigation

Recommended irrigation is 1”/week (if no rain)

Watering 1X/week promotes deeper root growth - becomes more tolerant of drought

Anecdotal observations in Barnstable show more frequent watering, some daily

1” irrigation = 623 gallons/1000 s.f.week

For an irrigated lawn of 5000 s.f. = 3115 gallons/week * 12 weeks = 37,380 gallons/season

For 10,000 s.f = 6330 gallons/week * 12 weeks = 74,760 gallons per season

No-Mow Fescue Lawn

Released Lawn

American Beach Grass

Turf Alternatives

Purple Love Grass
Photo Dan Jaffe

Wild Strawberry Lawn
Photo by Dan Jaffe

Pennsylvania Sedge Lawn
Photo by Dan Jaffe

Turf Alternatives

Bearberry

Black Huckleberry

Lowbush Blueberry (Carlos Montoya)

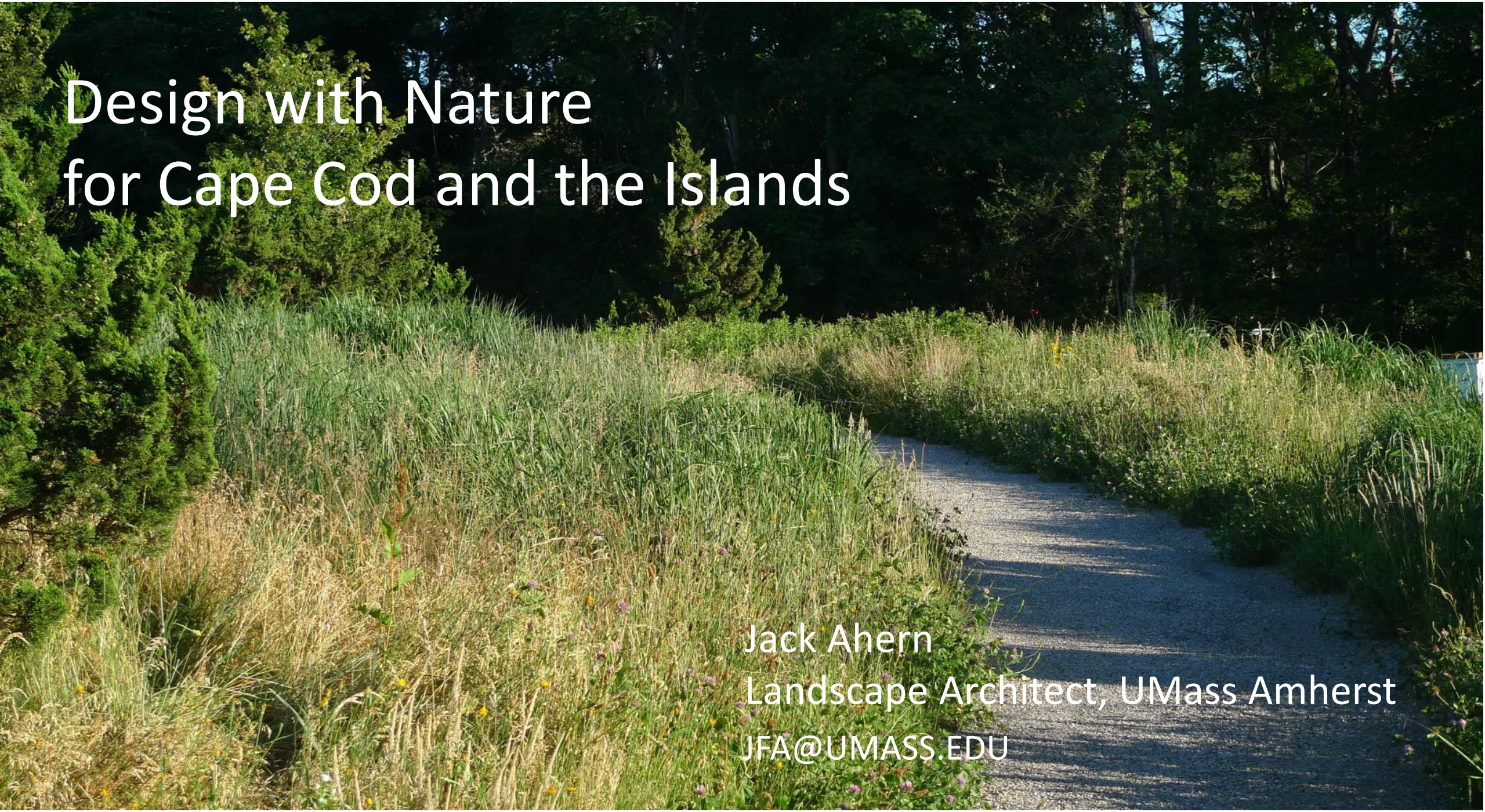
Turf Alternatives

Hay-scented Fern

Moss Lawn

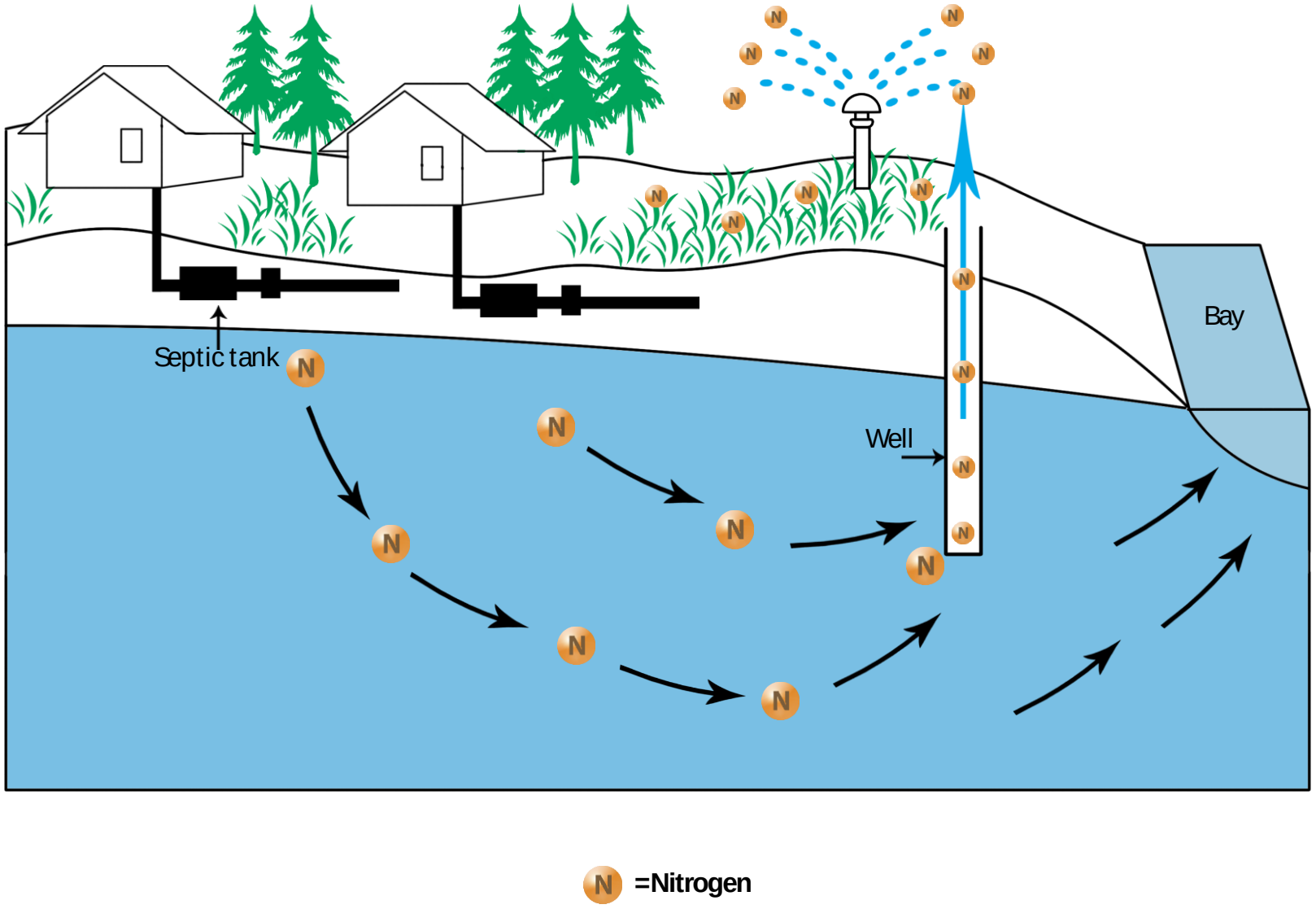
Sandplain Grassland (Carlos Montoya)

Turf Alternatives



Design with Nature for Cape Cod and the Islands

Jack Ahern
Landscape Architect, UMass Amherst
JFA@UMASS.EDU



Private On-Lot Irrigation Wells

Doubles as “Fertigation Well”

Recycles nitrogen (N) to lawns for uptake & helps to restore Cotuit Bay

Table 3: Summary of Existing Municipal Regulation of Private Wells and Irrigation Systems

Agency	Issues	Enacted By	Summary
Acton Water Supply District	irrigation systems	regulation	requires moisture sensor, backflow prevention, pre-installation notification, applies to new and existing systems
Town of Falmouth	irrigation systems	zoning bylaw	xeriscape required unless private well or drip/mist irrigation used
Town of Falmouth	private well water bans	bylaw	bans apply to private well irrigators when selectmen declare groundwater emergency
Northborough Water and Sewer Commission	irrigation systems	regulation	no new irrigation systems on public water, enacted 1985
Town of Westborough	irrigation systems	bylaw	no new underground sprinklers on public water, existing commercial systems must move to private well in one year, enacted 1996
Norfolk Water Department	irrigation systems	regulation	no new underground sprinklers on public water, enacted 1991
Stoughton Board of Health	private well irrigation systems	regulation	requires detailed design and pump test information before allowing irrigation system on private well
Walpole Water and Sewer Commission	irrigation systems	regulation	no new "outside irrigation systems" on public water, xeriscaping required
Mashpee Water District	irrigation systems	regulation	no new "automatic outside irrigation" systems on public water, existing systems may not be enlarged and require rain sensor, low flow heads and max 0.5 inch per week
Town of Sudbury	irrigation systems	bylaw	no new or expanded in ground irrigation on public water, permit for irrigation system from BOH, 100' wetlands setback for wells, moisture sensor and IPM plan required
Dedham Board of Health	irrigation wells	bylaw	new irrigation wells prohibited in water resource district
N. Andover Water District	irrigation systems	regulations	irrigation systems on public water require backflow preventer, rain sensor and second meter
Holliston Water Department	irrigation systems	regulation(?)	no irrigation systems on public water, no copy in appendix
Sterling Water Department	irrigation systems	regulation(?)	irrigation systems require rain sensor, no copy in appendix
Bridgewater Water Department	irrigation systems	regulation(?)	no irrigation systems on public water, no copy in appendix

From: Bunk & Dita Henderson <ditabunk@gmail.com>
Sent: Friday, July 24, 2020 8:58 PM
To: Chris Wiseman <chris@cotuitwater.org>
Subject: Water irrigation

Dear Members of the Cotuit Water Commission,

We may be unable to attend the public workshop on August 26, 2020, but we wish to register our comments.

We applaud the Water Commission's moratorium and other efforts to discourage the use of public drinking water for lawn irrigation. This is overdue.

We support a ban on the use of public drinking water for residential lawn irrigation, both for new connections and for existing connections. We are summer residents; we have a small lawn that turns brown in the summer. This is just fine; we do not feel deprived. We are outraged whenever we see automatic sprinkle systems wasting our drinking water. We hope you will ban the practice.

Thank you for considering these comments.

Bunker & Dita Henderson
75 Old Oyster Rd.
Cotuit

Economic Considerations for Private Irrigation Well

Estimated Cost for Private Irrigation Well & Pump =
$3722 - $5996 (average = $4859)

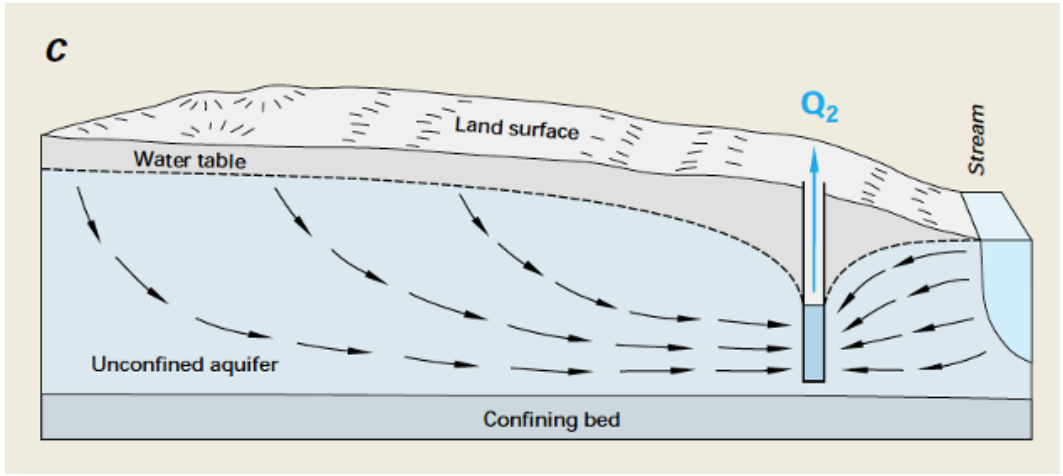
Amortized over 6 years = $809/year

Average Annual Cost of Irrigation on Public Drinking Water System = $800/year

Annual Return on Investment = 16.7%

Cotuit Fire District
Cotuit, Massachusetts
Water Department

Thank you for your participation and input



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