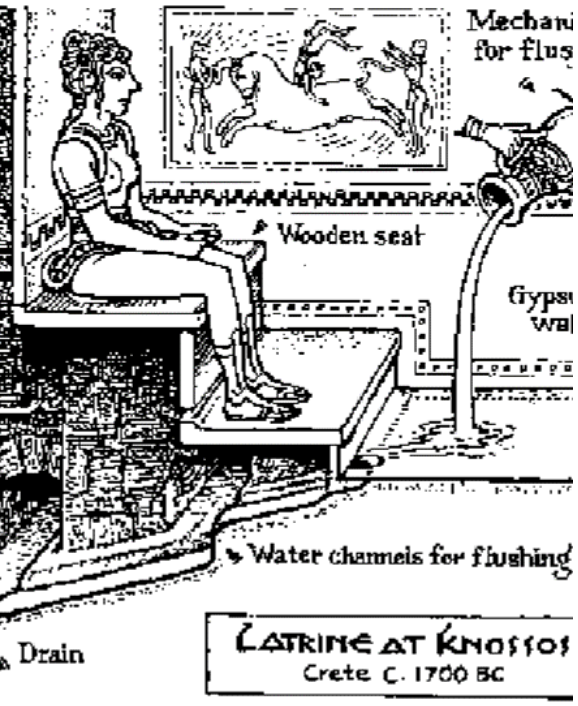
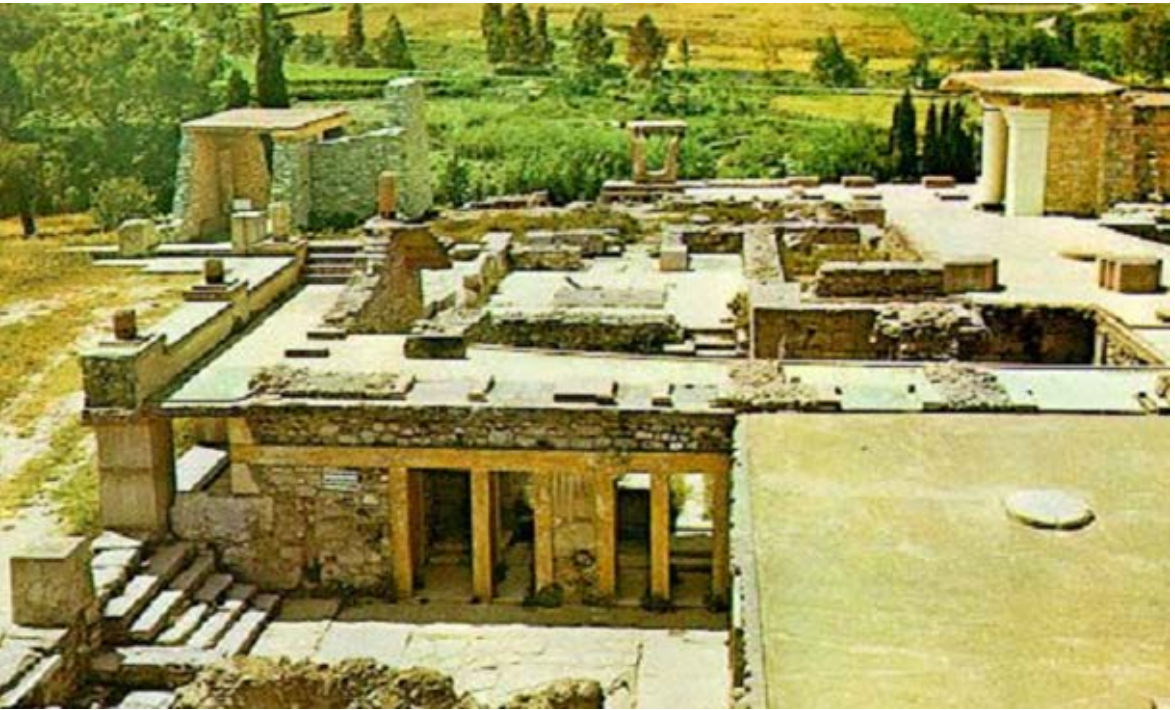
Decentralized Wastewater MOU Partnership Webinar Series

This webinar is sponsored by EPA's Decentralized Wastewater MOU Partnership, which consists of 18 organizations that work collaboratively to encourage proper decentralized system management and education on system maintenance in order to protect the nation's public health and water resources.

CAREER PERSPECTIVES IN DECENTRALIZED WASTEWATER MANAGEMENT

March 27, 2019





FORGOTTEN GENERATIONS – BEFORE EPA AND STATE AGENCIES

MINOAN PALACE AT KNOSNOS (1700 B.C.)

OLD SEPTIC TANK TECHNOLOGY

Jean-Louis Mouras developed the "Fosse Mouras" (Circa 1860)

FIG. 65.—Fosse Mouras (Bordeaux).

1970's

1969- Cayahoga River fire

1970- Congress created EPA

1970- NSF Standard 40

1972- Clean Water Act

1970s- First Health Department Regulations

1978- EPA Commissioned Onsite Report

1970's

Jim Bell:

- 1971- Graduated with a B.S. in Civil Engineering
- Joined MO National Guard
- 1973- Graduated with a M.S. in Sanitary Engineering
- Worked as a Research Engineer for Smith & Loveless, Inc.

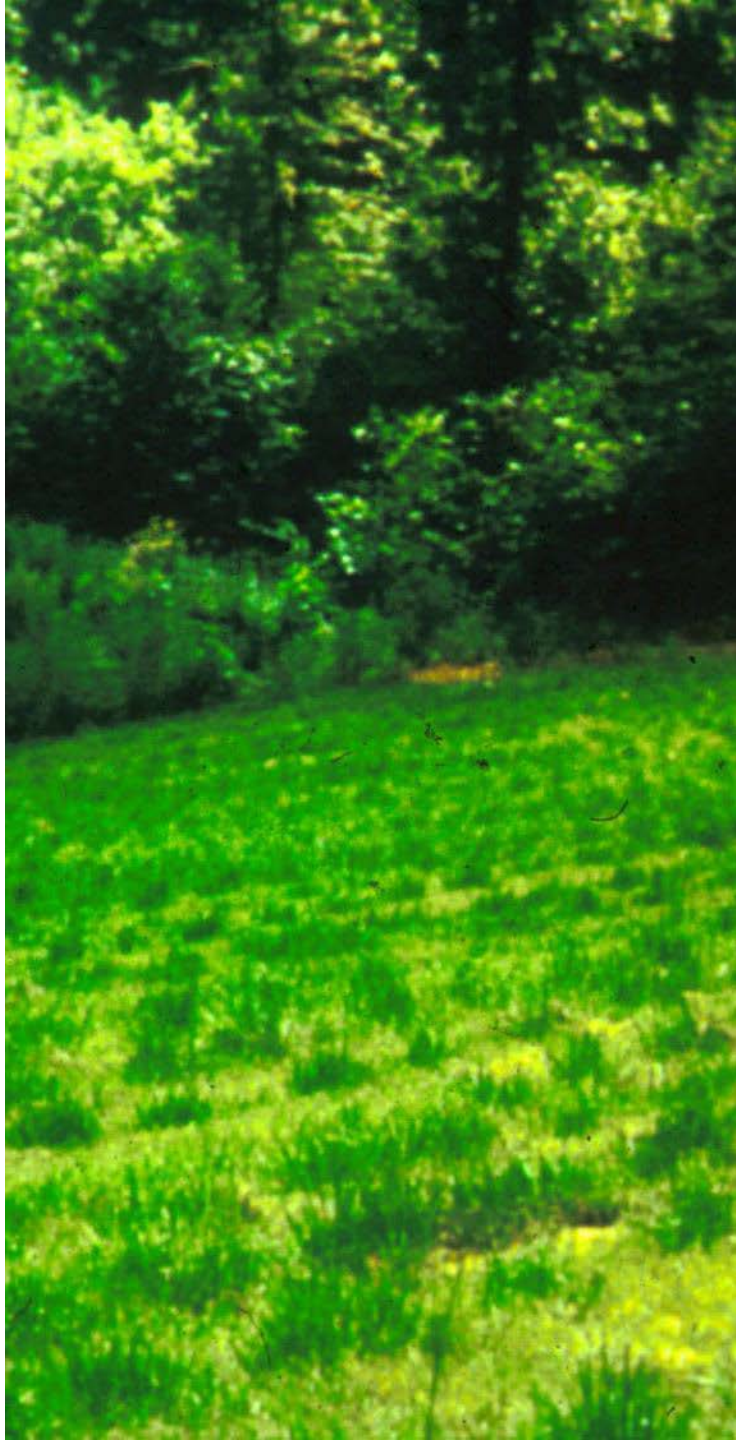
MANAGEMENT OF SMALL WASTE FLOWS

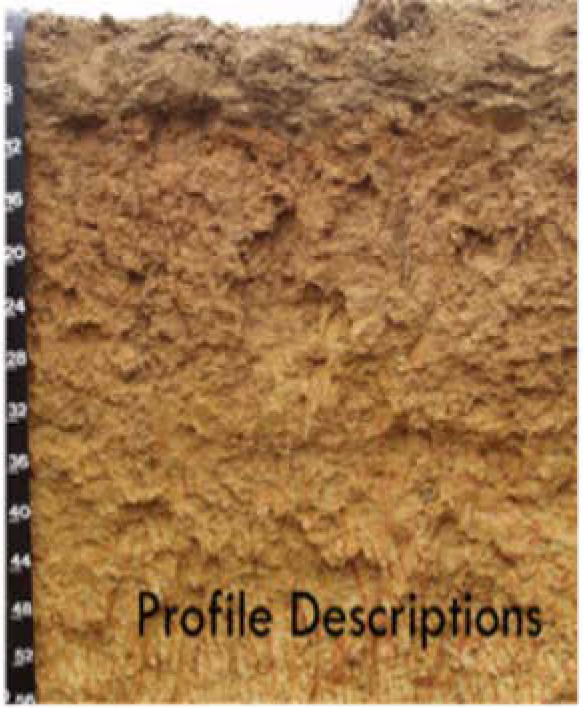
James Kreisel	EPA Project Officer
Jerry Tyler	U of WI Soil Science
Dick Otis	U of WI Civil & Environmental Engr.
Bob Siegrist	U of WI Civil & Environmental Engr.
James Converse	U of WI Agricultural Engineering

1970's

Bob Rubin:

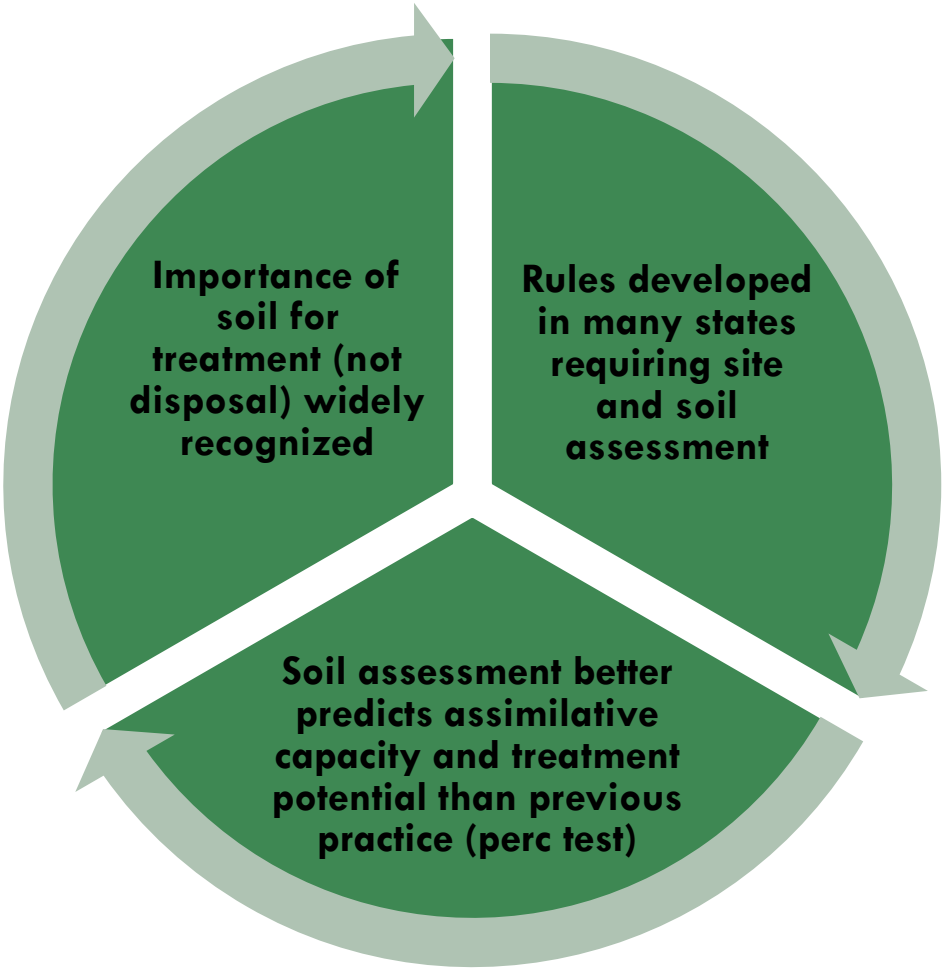
- Served as Advisor to NC DHHS Environmental Health staff
- Provided sanitarian training in soil evaluation hosted by NCSU
- EPA Region 4 grant for onsite wastewater system applications
- First publication accepted at the ASAE and NSF Onsite Wastewater Conference





SOIL SCIENCE IMPROVEMENTS IN SITE ASSESSMENT

SOIL DISPERSAL COMPONENT



1970's

Mary Clark:

- Graduated with a B.S. in Natural Resource Conservation
- First job was as a fire lookout on Mt. St. Helena
- 1976- Engineering technician for small civil/sanitary engineering consultant in Middlebury VT

1970'S IN VERMONT

- In VT, Health Department Regulations with local administration…
- Meaning most small towns did not have a way to review and approve designs
- Concern for very small lots being created around our 800+ lakes and ponds, 50' x 100' with no plan for drinking water, wastewater, etc.

1980's

1980- EPA's "Purple Book" "Onsite Wastewater Treatment and Disposal Systems" published

1980s- EPA's Construction Grants Program

1980s- New Technologies, ATUs

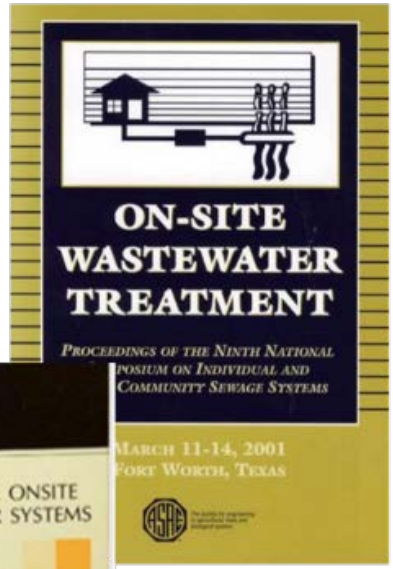
1985- Onsite Demonstration Projects

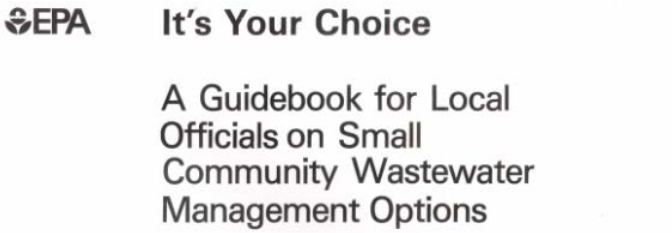
1987- EPA's "It's Your Choice" guidebook published

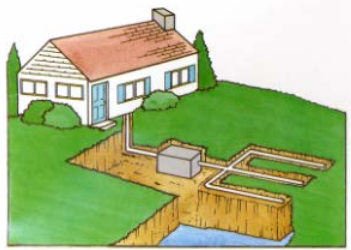
1980's

Bob Rubin:

- NSCU group assists EPA in developing :
  - Onsite Wastewater Systems Manual
  - "It's Your Choice" guide
- Mid 80's – Participated in onsite assessments addressing coastal Issues
- Designed and Installed first Pretreatment and DRIP dispersal system in NC
- Assisted with reviews of aeration systems
- Author and Co-Chair: ASAE Onsite Wastewater Symposium







1980's

Jim Bell:

- 1980s- Process Engineer at Smith & Loveless
- 1981- Obtained Professional Engineer license
- 1984- Participated in development of the ASCE Standard for Measurement of Oxygen Transfer in Clean Water

1980's

Mary Clark:

- Became licensed Site Technician
- Served as Assistant Regional Engineer
- No advanced treatment technologies available in VT

1990's

1993- Technologies include nitrogen testing

1993- NSF rewriting NSF40

1995- Massachusetts regulates onsite systems for nitrogen reduction

1996- EPA's "Watershed Approach Framework" published

2000's

2001- American Society of Agricultural and Biological Engineers (ASABE) publishes *On-site Wastewater Treatment* symposium proceedings

2002- EPA updates Design Manual

2003- EPA's "Voluntary Guidelines for Management" published

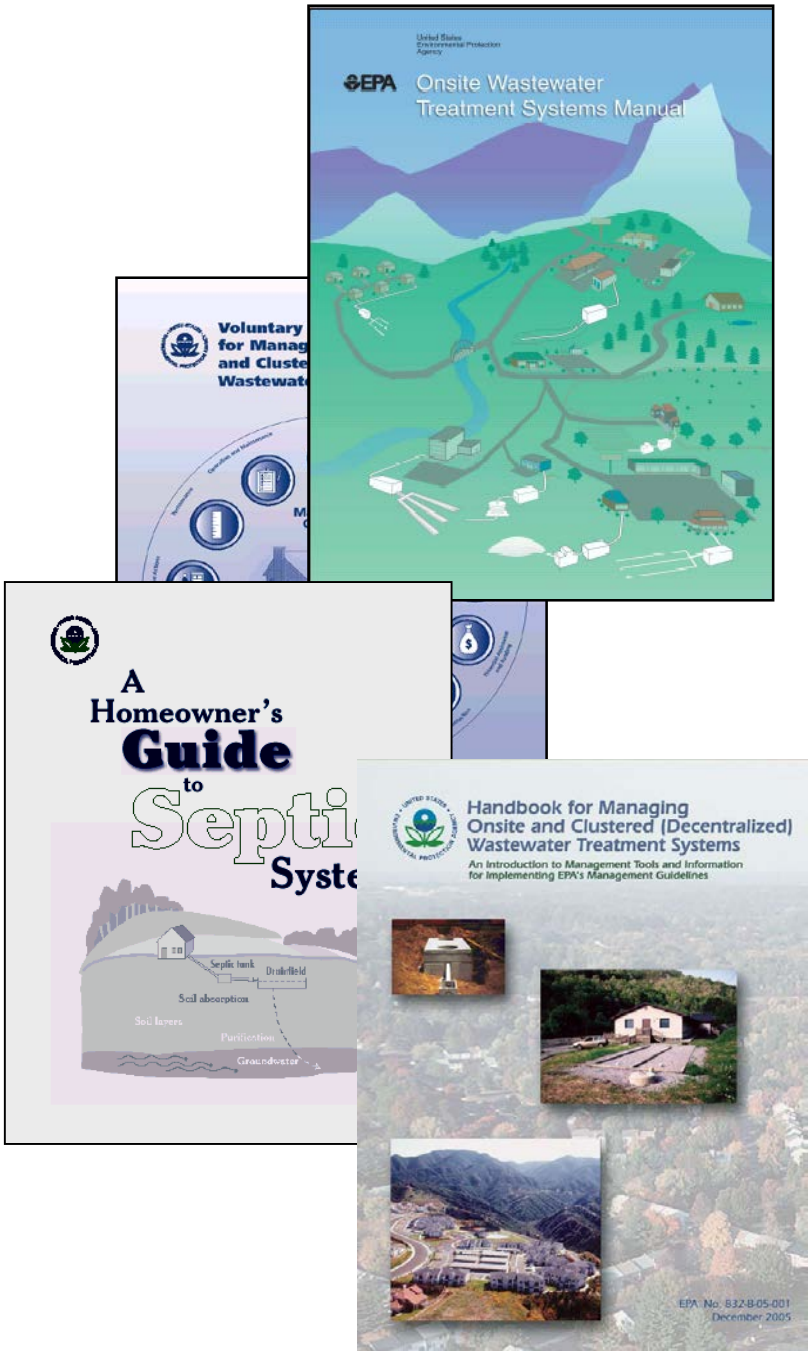
2007- NSF adopted first Nitrogen Reduction Standard, NSF 245

2008-2010- Housing Market Crash

1990'S AND 2000'S

Bob Rubin:

- Active involvement with American Society of Agricultural and Biological Engineers (ASABE)
- Emphasized training needs for all practitioners
- 1999-2005- Participated with EPA as "visiting scientist" on Resources Development
- Developed Onsite Indoor Reuse for NC Facilities
- Worked with EPA on Guideline Development



NSF/ANSI 350 EFFLUENT CRITERIA

Parameter	Class R	Class C
$CBOD_5$	10 mg/L (25)	10 mg/L (25)
TSS	10 mg/L (30)	10 mg/L (30)
Turbidity	5 NTU (10)	2 NTU (5)
E. Coli	14 MPN/100 mL (240)	2.2 MPN/100 mL (200)
pH	6.0 - 9.0	6.0 – 9.0
Chlorine	0.5 – 2.5 mg/L	0.5 – 2.5 mg/L

DESIGNED REUSE FOR WILKERSON PARK, WAKE COUNTY (NC)

	BOD	TS	TN	Coli	Turbidity (5 min/3 yr)
RQD	10	10			5
Ave	ND	ND	4	ND	.05
Max	7	ND	5	ND	.08

LARGE SCALE REUSE EXAMPLE – BATTERY PARK (NYC)

- Decentralized reuse in highly urbanized area
- LEED Platinum
- Green roof filters and captures stormwater
- Wastewater and stormwater treated for reuse
- 48% reduction in potable water consumption
- 56% reduction in wastewater discharge

Reference – Battery Park City Authority Manhattan Borough, NYC, The Solaire – Alliance Environmental, LLC

1990's and 2000's

Jim Bell:

- 1990s- Process Engineer at Smith & Loveless
- 1993- Member of the NSF Joint Committee
- 1996- Started BioMicrobics as an active Board of Directors member
- 2008- Moved to BioMicrobics as a full-time employee

1990's and 2000's

Mary Clark:

- Early 90's- Self-employed designing small scale systems
- Project Manager for Stone Environmental Inc. (1997-2007)
- Shifted to working for onsite wastewater manufacturers

2010'S TO PRESENT

2010s- Onsite systems are a major part of wastewater infrastructure

2011- First Water Reuse Standard, NSF 350

2010s- Interdisciplinary and comprehensive environmental management

2010s- Data sharing between agencies and emphasis on watershed approaches

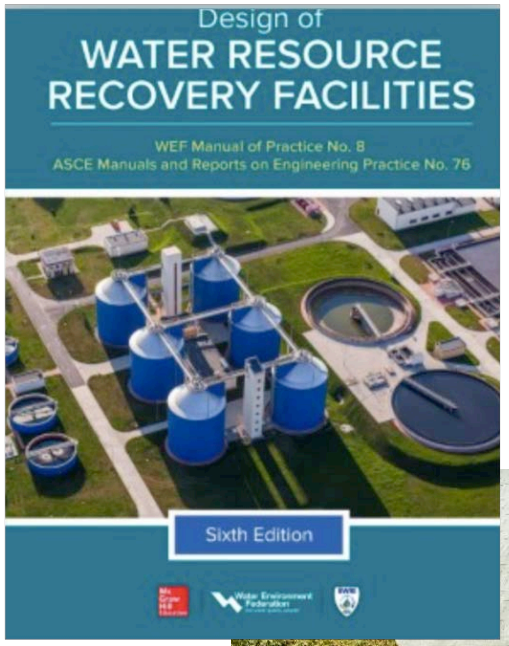
2010s- Performance-based rules

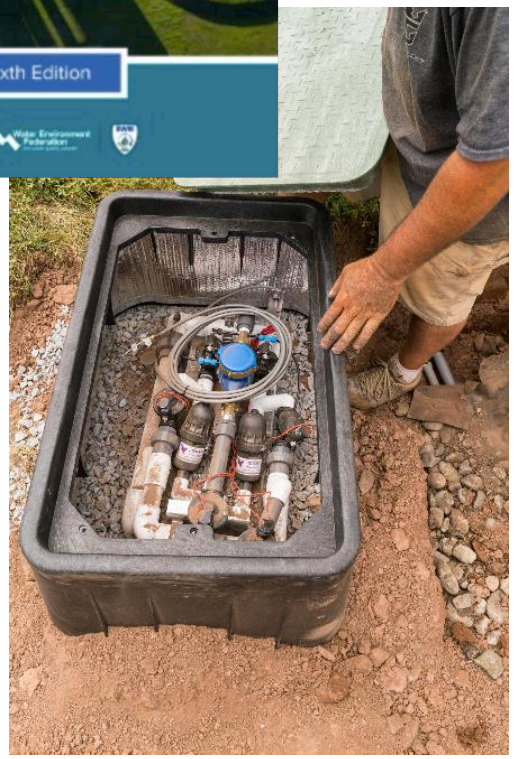
2010s- Training and capacity building

2010'S AND BEYOND

Bob Rubin:

- 2010s- Conducting research on:
  - Low-energy wastewater treatment with energy and nutrient recovery
  - Behavioral Economics
  - Examination of codes, rules, and regulations based on new science
- Emergence from a siloed approach toward comprehensive environmental management and resource recovery





2010's and Beyond

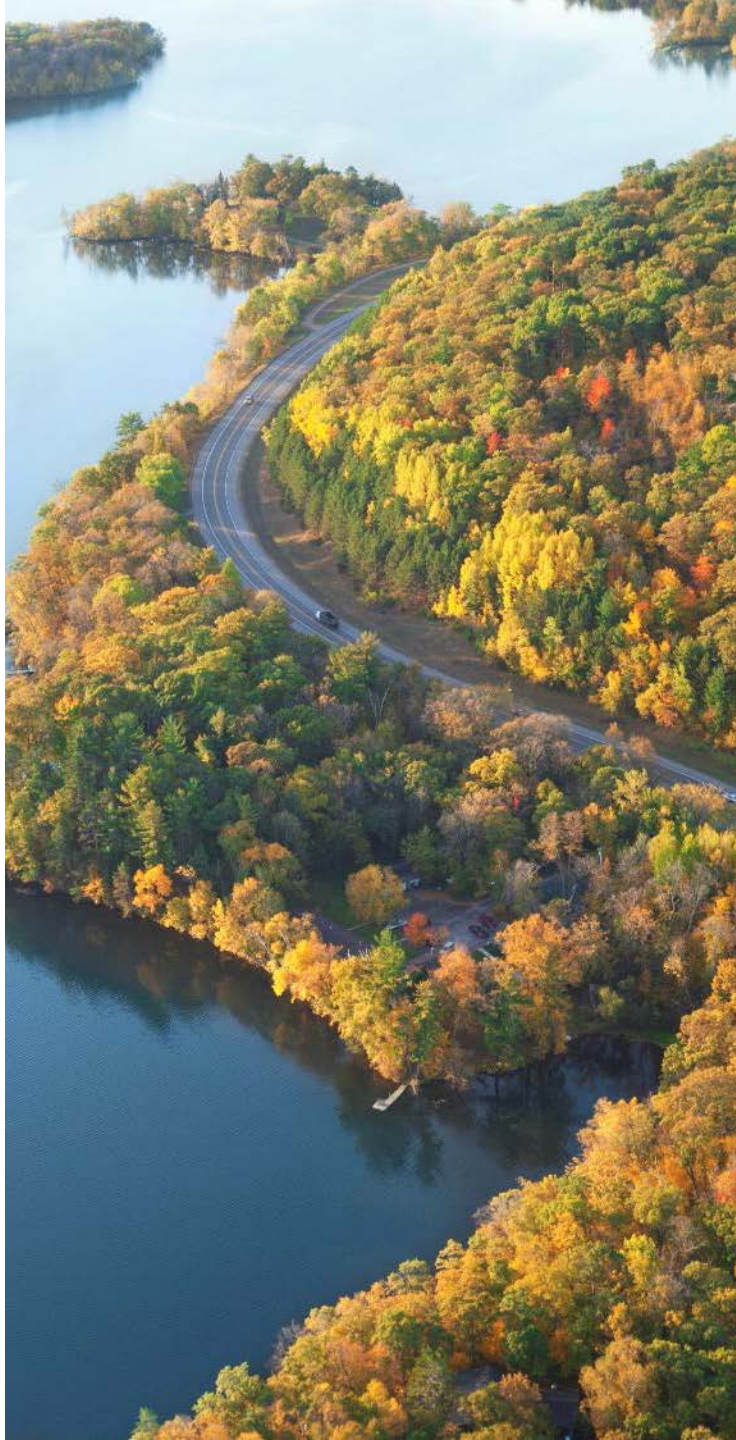
Jim Bell:

- 2010s- Became more involved with NOWRA and SORA
- 2015- President Elect for NOWRA
- 2017- President of NOWRA
- 2018- Past President of NOWRA
- 2019- Retired from full-time employment to part-time

2010'S AND BEYOND

Mary Clark:

- 2010s- Vermont I/A System Manager, Staff Hydrogeologist
- 2018- SORA President
- 2019- Focus on water/wastewater infrastructure for small communities
- 2019 and beyond- Stay involved with SORA and EPA MOU Partners work
- 2019 and beyond- Work in our garden and hang out in our wood/wetlands



THE FUTURE: 2020'S AND BEYOND

- One Water
- More research
- Manage technology
- Better connected Environmental Engineering curriculums and degrees
- Connect with rural economic development projects to support decentralized infrastructure solutions
- Improve public perception of potable water reuse

ROLES FOR ALL PROFESSIONALS

Establish	• Establish criteria (performance and prescriptive IAW community needs, state mandates, etc.)
Review	• Review to determine adequacy of design and management needs for systems in service area
Advise	• Advise elected and appointed officials of long term management requirements associated with their decisions
Assure	• Assure sustainability of programs

QUESTIONS?