

# NOW-R<sup>2</sup>: Identifying Priority Practice Needs on the Horizon for Onsite Wastewater Recycling

Jacob K. Stanley

Center for Reservoir and Aquatic Systems Research, Baylor University

# Why Horizon Scanning?

What are the world's biggest issues?

Who is going to solve them?

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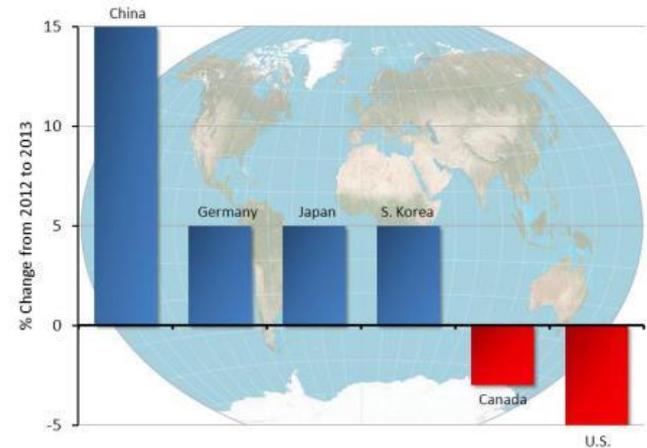
## The 20 big questions in science

From the nature of the universe (that's if there is only one) to the purpose of dreams, there are lots of things we still don't know – but we might do soon. A new book seeks some answers

Hayley Birch, Colin Stuart and Mun Keat Looi  
The Observer, Sunday 1 September 2013



## Scientific R&D Spending



Source: Cell, 2013 Jul 3;154(1):16-9.

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## Policy: Set research priorities in a time of recession

Patrick Cunningham<sup>1</sup>

23 October 2013

Rigorous analyses are needed to establish the benefits of the knowledge economy, says former

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# Previous Examples:

## Global Horizon Scanning Project

- The Global Horizon Scanning Project aims to identify important and timely environmental quality research needs
- Research questions identified, if answered, would markedly advance toward more sustainable environmental quality over the next decade
- Unique partnership with SETAC (and ACS ENVR and AGRO Divisions in NA)



*Global. Transparent. Inclusive. Multidisciplinary. Multisector.*

# Previous Examples: Understanding Needs, Challenges, Opportunities, Vision and Emerging Roles in Environmental Health



What are the key challenges and opportunities facing environmental public health practitioners?

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# UNCOVER-EH Problem Statements for Onsite Wastewater Recycling

Onsite wastewater management is differentially implemented (e.g., design parameters), administered and assessed.

Lack of collaboration during onsite wastewater management policy development (“delegation without consideration”) results in gaps in programmatic capacity.

There is a lack of data to support transitions from prescriptive to performance-based standards for onsite systems.

Adverse health outcomes are presented from aging wastewater infrastructure associated with and because of increasing rural to urban demographic transitions and urbanization.

New onsite technologies lack sustainable onsite wastewater implementation and performance data, including during droughts and flooding, to address emerging threats.

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# What are the Key Practice Needs for Onsite Wastewater?



## Needs for Onsite Wastewater Recycling Research

Unique Partnership with NOWRA

Steering Committee with Diverse Representation

Followed established survey and workshop synthesis methods

Phase 1: Survey

- input from hundreds in business, government, academic, NGOs

Phase 2: Synthesis workshop at 2021 Mega-Conference in San Marcos



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# Identifying Problem Statements

- Assess the current and emerging challenges impacting decentralized wastewater and professionals working in the area.
- Identify essential information for ensuring decentralized wastewater is prepared and ready to address current and emerging challenges.
- Develop problem statements from survey responses
  - Should be concise
  - Should be specific
  - Should be measurable
  - Should not include recommendations or identify interventions

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## We asked professionals two questions...

*Within the next 5-10 years, what decentralized wastewater issues or challenges will require new or modified programs or technologies?*

*What resources or tools will you need to do your job in the future?*

Priority Problem Statements Identified Across Five Themes

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# Technology, Infrastructure and Reuse

Needs to address aging decentralized wastewater infrastructure exist, but community (e.g., individual, schools, small businesses) needs and locations are not understood within and among States and Territories

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# Technology, Infrastructure and Reuse

Decentralized technologies must advance to meet water conservation and reuse needs, particularly with clustered systems, but technologies are advancing faster than policies and community acceptance

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# Technology, Infrastructure and Reuse

Technology is not being consistently, efficiently and equitably employed to address differential conditions, including environmentally sensitive areas, soils, dynamic flows and strength

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# Technology, Infrastructure and Reuse

Current disinfection strategies and verification approaches are not consistently and effectively applied to protect public health and the environment

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# Technology, Infrastructure and Reuse

Because watershed development can result in water quality impairments, technologies are not consistently available and implemented to address different system densities, area limitations and site-specific conditions (e.g., soils, slope, distance from water table/surface waters)

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# Technology, Infrastructure and Reuse

Septage, FOG etc disposal, which typically uses WWTPs or landfills (e.g., for dewatered material), is increasingly a challenge due to changing capacity, practice and policy

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# Technology, Infrastructure and Reuse

Information is lacking on septage capacity, processing and resource recovery to enable compliance.

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# Technology, Infrastructure and Reuse

Site limitations and increasing regulations are increasing the cost of systems.

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# Technology, Infrastructure and Reuse

There are significant economic limitations to providing situationally appropriate solutions for adequate technology solutions, maintenance programs and regulations in the decentralized industry.

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# Technology, Infrastructure and Reuse

Automation and remote sensing data to improve performance, management and longevity to validate protection of public health and the environment is lacking.

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# Technology, Infrastructure and Reuse

Information on performance and management of existing onsite systems is not available.

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# Information Systems and Data

A jurisdiction level inventory of the entities authorized to manage decentralized systems (e.g., co-ops, Private, local government) is lacking.

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# Information Systems and Data

A comprehensive understanding of what factors that impact appropriate density for decentralized systems (e.g., 1/4 acre, 1/2 acre soil, slope) is not available.

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# Information Systems and Data

Septic system data from the American Community Survey is not being leveraged to improve management within the onsite wastewater community.

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# Information Systems and Data

Adequate data related to existing, new and repaired systems at local, state, and national levels for policy decisions is lacking.

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# Information Systems and Data

Home owners are the most responsible party for resilient decentralized systems and are the least knowledgeable about the operation and maintenance of these systems.

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## Emerging Issues

If wildfires are more prevalent, onsite systems increasingly made of plastic are susceptible to destruction, yet FEMA payouts for onsite systems are not sufficient.

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## Emerging Issues

Water shortages will require higher quality treatment for reclamation or reuse.

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## Emerging Issues

Communities impacted by climate change, coastal areas dealing with salt water intrusion, storm surge, and increased precipitation are not consistently, effectively and equitably adapting

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## Emerging Issues

Inequity of funding between centralized and decentralized wastewater recycling systems is not being addressed.

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## Emerging Issues

Challenges with changing wastewater characteristics for non-biological contaminants are not well understood for regulatory activities.

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## Emerging Issues

Regional national resource shortages of necessary materials for construction (e.g., aggregate, sand, topsoil) is becoming a challenge for onsite wastewater.

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# Garnering Support

In much of the US there are inadequate inventories, mechanisms and funding directed to upgrade decentralized properties.

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# Garnering Support

There is a deficiency in knowledge about benefits and drawbacks of decentralized systems and management among the public, users, policy makers, and related industries.

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## Garnering Support

There is a lack of an adequate national regulatory framework and guidelines for how septic systems are regulated.

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# Garnering Support

The decentralized industry is lacking sustainable funding mechanisms for enforcement programs to monitoring and manage systems.

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# Garnering Support

There is a shortage of larger entities willing to manage systems, which is creating a need for other models.



## Needs for Onsite Wastewater Recycling Research

Next steps...

Preparing manuscripts for publication

Dissemination of findings key stakeholders, funders