# NOWRA Position Paper:

# Causes of Seagrass and Manatee Loss in the Indian River Lagoon

Evidence-Based Analysis for Environmental Scientists, Policymakers, and Conservationists

## Introduction

The Indian River Lagoon (IRL), stretching along Florida's east coast, is recognized as one of North America's most biodiverse estuaries. Its ecological health is vital for a range of species, notably seagrasses and the threatened Florida manatee (Trichechus manatus latirostris). Seagrass meadows provide food, shelter, and nursery grounds for marine life, while manatees rely on these habitats for sustenance. Over recent decades, both seagrass coverage and manatee populations have experienced significant decline, raising urgent concerns for scientists, policymakers, and conservationists. This position paper analyzes the primary causes of these losses, focusing on pollution sources and their relative contributions, the impact of water temperature, and the comparative statistics of manatee mortality due to physical and environmental factors.

## Discussion

### 1. An Evolving Landscape

Onsite and decentralized wastewater treatment systems are the only available option for greater than 25% of new and existing infrastructure in the United States. These systems serve individual homes, commercial establishments including high strength wastewater applications like restaurants or schools, and cluster systems serving subdivisions and small towns and are subject to environmental pressures and different levels of regulatory oversight.

Technological innovation and difficult sites are defining features of the field. Treatment processes, monitoring equipment, and design strategies have evolved rapidly, offering opportunities for enhanced efficiency, reliability, and environmental performance. However, utilizing these innovations requires a workforce that is educated in the basic techniques and all tools, methodologies, and regulatory standards. Initial and ongoing training ensures that professionals are equipped to navigate this evolving landscape, integrating best practices and new techniques into their daily work.

## 2. Regulatory Oversight and Risk Management

The regulatory framework governing onsite and decentralized wastewater systems is complex and needs to be flexible enough to utilize new and emerging techniques and changing policy priorities. Regulations may pertain to soil limitations, effluent quality, system sizing/location, maintenance, and installation requirements. Unfortunately, many regulatory frameworks are inflexible and too cumbersome to adapt to the continually advancing range of technologies or techniques available to help address difficult sites. Staff that are well grounded in the scientific and technical basis for regulatory requirements are more likely to recognize and allow new technologies that provide a new way to achieve the regulatory goal.

Professional development provides regulatory professionals with up-to-date knowledge of emerging technologies and techniques and the skills to interpret and implement them effectively. Training courses, certification programs, and in-person workshops help ensure that practitioners and regulators alike can explain, defend, implement, and adapt policies and practices while maintaining standards and compliance. A proactive approach reduces the risk of costly errors and enhances accountability within the sector.

## 3. Protecting Public Health and Environmental Quality

At its core, wastewater treatment at any level is a public and environmental health discipline. Malfunctioning onsite and decentralized systems can result in the contamination of drinking water sources, outbreaks of waterborne diseases, and the degradation of ecosystems.

Professional development equips practitioners with the scientific and technical knowledge necessary to protect public health and the environment. Topics such as pathogen transport, nutrient dynamics, system hydraulics, and soil science are continually evolving, and new and better options must be integrated into practice. Ongoing learning ensures that professionals are prepared to design, install, monitor, and maintain systems that meet the safety and sustainability standards.

## 4. Enhancing Professionalism and Ethical Responsibility

The onsite and decentralized wastewater field is rooted in a tradition of service—service to individuals, businesses, communities, the environment, and to future generations. Professional development is a hallmark of professionalism, signaling a commitment to excellence, accountability, and ethical stewardship. It creates pathways for career advancement, fosters a culture of innovation, and builds public confidence in the sector.

Professional development also promotes ethical decision-making. As practitioners encounter complex scenarios—balancing cost, performance, and community concerns—they must draw upon a solid foundation of knowledge, critical thinking, and ethical principles. Ongoing education reinforces these values, helping to mitigate conflicts of interest and ensure that the interests of public health and environmental protection remain paramount.

## 5. Addressing Workforce Shortages and Succession Planning

Many regions face shortages of skilled professionals in the onsite and decentralized wastewater sector, with impending retirements posing additional challenges. Professional development supports workforce development by attracting new talent, retaining experienced staff, and facilitating succession planning. Mentorship, apprenticeships, and structured training programs help transfer institutional knowledge and best practices, ensuring continuity and resilience in the sector.

## 6. Pathways for Professional Development

A robust professional development framework in the onsite and decentralized wastewater field may include a variety of formats:

- Workshops, conferences, and seminars featuring the latest research, regulatory updates, and emerging technologies
- Online learning platforms, webinars, and self-paced modules catering to remote or rural professionals
- Peer-to-peer learning, mentorship, and knowledge-sharing networks
- On-the-job training, site visits, and hands-on demonstrations

Employers, regulators, NOWRA and its state affiliates should collaborate to ensure that high-quality professional development opportunities are available to all practitioners, regardless of geographic location or organizational size.

## 7. Overcoming Barriers to Participation

Despite its recognized importance, professional development in the onsite industry has faced barriers such as cost, time constraints, and limited access in rural or underserved areas. Now, with NOWRA and its state affiliates' online resources, requiring ongoing training is much more affordable and easily accessible to everyone, with very minimal downtime. What is vital moving forward in the onsite industry is to foster a culture that values and rewards lifelong learning at all levels of the profession.

## Conclusion

The onsite and decentralized wastewater field is confronting both challenges and opportunities. Workforce and professional development stands as the cornerstone of a resilient, adaptive, and effective workforce. By investing in a comprehensive training program and ongoing professional development, we empower practitioners to deliver safe, sustainable, and innovative wastewater solutions that protect public health and the environment. Stakeholders, including government agencies, employers, and professional associations, must prioritize participation in these programs.

In a world where change is the only constant, the commitment to workforce training and lifelong learning is not only prudent, but also imperative. Those who manage and oversee onsite and decentralized wastewater systems bear a profound responsibility to their customers, communities, and the environment. Through workforce and professional development, we can meet this responsibility with knowledge, integrity, and confidence, ensuring that the essential work we do remains a force for public good and environmental stewardship for generations to come.

*This position paper was approved unanimously at the November 20, 2025, NOWRA Board of Directors meeting.*