# Sediment Literacy: Empowering Future Generations for Sustainable Interactions with Natural Resources in an Increasingly Complex World

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**Introduction:** Sediments are fundamental to ecosystems and human development. As demands on rivers, oceans, and coastal areas grow - from transportation and hydropower to fisheries and cooling networks - conflicts over their use grow, driven by climate change and competing interests. At the same time, misinformation, the lack of willingness to engage deeply with complex topics, and the rapid spread of polarizing narratives through social media hinder public understanding of these challenges. To address this, basic sediment literacy is not only essential for understanding processes that enable informed and sustainable decisions in the management of rivers and oceans. It empowers individuals and communities to engage critically in decision-making, fostering sustainable interactions with natural resources in an increasingly complex world.

**Methods:** Education plays a vital role in addressing these issues, aligning with the principles of good governance. Institutions have a responsibility not only to ensure transparency and accessibility of information but also to actively disseminate and contextualize this information for diverse audiences. Knowledge transfer between scientists, policymakers, stakeholders, and citizens must be prioritized to foster shared understanding and collaboration.

This contribution draws on the author's background in risk communication and disaster risk reduction to propose strategies for fostering sediment literacy. International examples of successful formats for promoting risk literacy and geological literacy - including interactive workshops, community engagement initiatives, and participatory learning models - are explored [1]. These examples provide a framework for developing literacy programs that are both impactful and adaptable to various contexts.

The potential of artificial intelligence (AI) to deliver tailored educational content is also emphasized. AI can be leveraged to create age-appropriate materials, analyze learning outcomes, and adjust content to meet the needs of different demographics. This technology holds promise for enhancing engagement and ensuring that educational initiatives resonate with their intended audiences. Additionally, the role of digital platforms such as Instagram and TikTok is critically evaluated. While these tools have the potential to engage younger audiences, their effectiveness depends on their integration with other educational approaches, such as museum exhibits and school curricula development. Questions remain about how these methods can complement one another and whether their combined use can create a more comprehensive educational strategy.

**Results:** The proposed approaches demonstrate significant potential for equipping individuals with the knowledge required to navigate the complexities of sediment management. By integrating AI-driven tools with traditional and digital educational platforms, these initiatives create accessible and engaging content tailored to diverse audiences. International case studies illustrate how participatory learning can deepen understanding and prepare society to address the challenges associated with water body management and sediment dynamics. These strategies provide actionable frameworks for fostering public awareness and improving decision-making processes in various contexts related to sediments as a natural resource.

**Discussion:** Education is a cornerstone in all sustainable resource management, bridging the gap between technical expertise and public engagement. In addition to advancing understanding of sediment dynamics, effective educational strategies align with the principles of good governance. Institutions have an obligation to provide transparent, accessible, and contextualized information, ensuring that the public can actively participate in sustainable decision-making processes. By emphasizing their responsibilities, institutions can build trust and collaboration among stakeholders. Without such efforts, even the most robust management measures risk failure due to public resistance. Leveraging AI and innovative educational methods, sediment literacy becomes a pathway to informed decisions and sustainable practices.

**References:** [1] UNDRR, *PreventionWeb* (2025). Disaster Risk Reduction Resources. Available at: https://www.preventionweb.net/ (Accessed: January 2, 2025).