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Communicating coral: Art and science for global reef action

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Coral reefs are experiencing unprecedented rapid decline. Art can act as a beacon to engage audiences, influence policy, and inspire global action.

Coral reefs are the frontline sentinels of planetary change, revealing the consequences of a warming world before they fully unfold. Today, they are among the most threatened ecosystems on Earth due to climate change and other environmental insults such as overfishing, pollution, and coastal development.

Once rare, mass coral bleaching events now occur frequently and at global scales, leaving degraded ecosystems unable to recover (*1*). These biodiversity hotspots provide food security, coastal protection, cultural identity, and livelihoods for hundreds of millions of people worldwide (*2*) making conservation and restoration efforts a top priority. Addressing the reef crisis requires collective action marked by robust public policy and public engagement (*3*). Reef conservation can benefit from grassroots movements, citizen-led initiatives, and digital platforms that mobilize collective action at meaningful scales (*4*).

Art has long played a role in mobilizing public attention around environmental and social issues. Agnes Denes (*5*) grew two acres of wheat on a landfill in Manhattan, juxtaposing natural cycles with urban development and consumerism. Olafur Eliasson and Minik Rosing's Ice Watch installed massive blocks of glacial ice in European cities, allowing them to melt before passersby as a visceral demonstration of climate change (*6*). These projects succeeded because they connected with audiences while linking distant or abstract crises to immediate, tangible experiences. In the context of reefs, similar artistic interventions can render the largely unseen underwater world into something visible and accessible. When paired with scientific data, interactive design, and clear calls to action, coral-inspired art installations in cities worldwide can amplify public understanding and galvanize support.

Coral reefs are not only a source of aesthetic inspiration but also a poignant symbol of nature's fragility and resilience (*7*). Art can offer more than reflection; it can serve as a powerful tool to inspire, educate, and drive collective action. Artistic initiatives addressing the coral reef crisis are not new, but their scope and impact have often been local or disconnected from one another. While these projects successfully blend ecological restoration with public engagement, their impact is usually limited to specific regions.

UNESCO's Art for Climate Action has shown how art can translate complex scientific concepts into accessible narratives, enriching engagement and opening new pathways for scientists to share their findings. Integrating scientific and artistic approaches can create more inclusive and resonant conservation narratives (*8*). Documentaries such as "Chasing Coral" or David Attenborough's "Ocean" have reached global audiences, combining stunning imagery with urgent scientific messaging. Music and dance can create deep emotional resonance and foster personal connections to environmental issues. Incorporating coral reef narratives into mainstream media, from books, to motion pictures and virtual experiences, has the power to embed reef conservation into the global consciousness.

Design in its many forms holds transformative power. Graphic design can distill complex ecological data into striking messages. Product design can embed reef awareness into consumer goods and biomimetic technologies. The fashion industry, with vast cultural reach, can amplify reef narratives through textiles and campaigns that connect ecological beauty with lifestyle choices, while promoting sustainable materials that reduce marine harm. Landscape design can extend reefs into public spaces by integrating coral-inspired forms into parks and waterfronts. Together, these practices shape culture, reaching millions and integrating reefs into everyday imagination, conversation, and decision-making.

The concept of "functional beauty" links aesthetics with ecological function (*9*). Rather than focusing only on bright colors or forms, art and design interventions can highlight the roles and relationships of less showy species. Seeing beauty in ecological processes fosters deeper connections between aesthetics, knowledge, and conservation. These approaches also raise questions of scalability and inclusivity. Because perceptions of beauty are culturally constructed, certain reef organisms may be ignored. Addressing these biases requires systematic study of public preferences and deliberate choices by artists and communicators. Done well, art-science collaborations can broaden perspectives and expand conservation potential.

More slowly than they should, scientific institutions are nonetheless embracing art more meaningfully. The Schmidt Ocean Institute hosts an Artist-at-Sea Program to foster creative interpretations of science. Parley for the Oceans integrates art into its campaigns to communicate complex science in accessible ways. Other collaborations have scaled visions of reef futures to global audiences.

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Fig. 1. Water People illustrates the interconnectedness of reefs and humans. Credit: Christina Mittemeier.

These works translated forward-thinking research into vivid illustrations that engaged policy-makers and communities alike.

For many people far removed from tropical and subtropical coasts, reefs are abstract and unfamiliar, whereas for most indigenous coastal communities, they are not only critical to food security but also central to their identity and cultural heritage (*10*). These communities are too often excluded from decision-making and face social and economic challenges that often overshadow environmental concerns. Early consultation with affected communities to create feedback mechanisms are essential to ensure equity and legitimacy. By involving local voices as co-creators rather than passive recipients, these initiatives avoid reproducing top-down approaches. Education, art, design, and creative practices can amplify these efforts, transforming passive awareness into active stewardship.

The impact of art and design on reef conservation ultimately depends on their power to mobilize collective action. The Coral Art-Science Consortium (*11*) is a new nonprofit initiative led by scientists and artists from multiple nations dedicated to protecting coral reefs through storytelling, collaboration, and environmental awareness. Examples of ongoing collaborative efforts include sculpture, painting, textiles, photography, film, and other visual and creative arts (*11*). The consortium represents an early step toward a global movement that may take many forms including synchronized events, coral-themed festivals, virtual exhibitions, and participatory projects. By fostering shared responsibility, the consortium has the potential to transform isolated efforts into a cohesive cultural response. Local events could help build networks around specific coastal challenges. Empowering collectives in the Global South, where most reefs are located, is essential to avoid overlooking local needs. Financing such ambitious efforts will require not only public and private investment but also creative alternatives, some of them emerging from members of our consortium. For example, (i) innovative financing mechanisms, including digital art markets and emerging nature-positive investment models, may provide new sources of support for coral reef stewardship, restoration, and resilience initiatives, and (ii) artists can advance environmental action by exploring frameworks that recognize nature's rights to royalties, generating sustainable funding streams for marine ecosystem protection and recovery.

Ultimately, the coral reef crisis demands multifaceted solutions. Science provides data and strategies for conservation and restoration, while art and design bring emotional resonance. Together, they create a narrative that transcends jargon and politics, reaching hearts as well as minds. Online activism campaigns and citizen science platforms broaden participation, including bringing indigenous voices to enable communities worldwide to contribute to monitoring and advocacy. All partners should stand together at the forefront of this global communication effort. Reefs are more than ecosystems; they are living works of art shaped over millions of years. Preserving them requires every tool at our disposal, including human ingenuity.

In reimagining the future of coral reefs, we reaffirm the profound bond between people and nature. We call for an interdisciplinary alliance among scientists, artists, policy-makers, educators, and communities to expand awareness of the reef crisis and transform public perception from neglect to curiosity, from curiosity to inspiration, and ultimately from inspiration to action.

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