Paper ID	216
Author(s)	Toru Ishii
Title	What the clear colors of the sea mean

Abstract

The Seto Inland Sea, including the waters around Teshima, is a closed sea area that was once considered the best fishing ground in the world. Its history is recent, having been created by the retreating glaciers of the Holocene epoch. This sea is affected by 50 billion m3 of land water per year, mainly from 664 rivers, and when it rains, the salinity immediately decreases and nutrient salts increase. The sea was also rich in a wide variety of biota, from freshwater to brackish to saltwater.

After the war, however, the mountains were planted with coniferous forests, replacing lucidophyllous forests. The coastline was reclaimed, tidal flats and seagrass beds were reduced, and the shoreline was hardened with concrete.

A thousand dams were built on rivers, and sand was mined from the seabed for construction materials. The Seto Inland Sea became eutrophic due to the increase in the coastal population and drainage, and red tides became a problem. In response, a law was passed in 1973 to regulate the total amount of nutrient salts in wastewater. However, the nutrients and sand carried from the mountains accumulate in dams and do not reach the Seto Inland Sea. In recent years, the seawater temperature has increased along with the air temperature, the bottom sediment has become muddy, the fish species have changed, and catch has decreased dramatically. Nevertheless, the transparency of the sea is higher than before. We will explore the meaning of this.

Keywords	Animals, Plants, Water, Waste, Humans

Paper ID	237
Author(s)	Hiroko Nakamura and Takehiro Tanaka
Title	40 Years of Eelgrass Restoration in Okayama, Japan

Abstract

Eelgrass meadows in Hinase, Okayama, once spanning 590 hectares in the 1950s, dwindled to just 5 hectares by the 1980s. In 1985, local fishermen began restoration efforts through seeding but faced initial challenges. Experimentation revealed oyster shells, readily available from local aquaculture, to be an effective seabed improver. Collaborations between fishermen, researchers, and engineers from 1994–1996 led to the publication of restoration guidelines in 2001, accelerating efforts. By 2007, meadows expanded to 80 hectares, and the "Amamo Club," a fishermen-led group, was established in 2009.

From 2010, local organizations and citizens joined the effort, with students participating in annual activities like seeding and cleaning. By 2015, meadows grew to 250 hectares, and intergenerational participation expanded with school programs and community support. Fishermen continued to engage in forest conservation activities that led to the preservation of coastal ecosystems and were joined by Satoyama groups in 2016, followed by agricultural groups in 2018. By 2021, eelgrass areas exceeded 270 hectares, with over 1.5 billion seeds sown, spreading restoration across Okayama's coastline.

In 2017, the Bizen Satoumi-Satoyama Brand Promotion Council was launched to integrate conservation with education, research, and tourism. This led to the opening of the Hinase Umi Lab (2021) and Satoyama-Satoumi Exchange Center (2022), hosting marine education programs for schools, companies, and families. Despite

challenges like the COVID-19 pandemic, the project has become a model of sustainable, community-driven marine restoration, combining resilience and collaboration to secure a healthier coastal ecosystem for future generations.	
Keywords	Plants, Water

Paper ID	215
Author(s)	MASASHI MIYAGAWA and YOSHIHIRO SUENAGA
Title	Environmental history and future prospects of seaweed and seagrass beds in the Seto Inland Sea.

Abstract

The Seto Inland Sea, a semi-enclosed body of water, is located in one of Japan's most densely populated regions, home to approximately 35 million people. Historically, eutrophication due to pollution from rapid economic growth caused a surge in red tides, significantly harming the fishing industry. To address this issue, we implemented unique environmental conservation methods specific to the Seto Inland Sea, achieving notable success. This effort also served as a large-scale experiment in artificially reducing nutrient influx. As a result, nutrient levels in the sea have decreased to the point where the area is now often described as oligotrophic. This reduction in nutrient levels has led to a decline in the high biological productivity seen during the eutrophication era, and fisheries production has continued its long-term decline. However, this decline in biological productivity is not solely due to nutrient depletion but is largely attributed to the decline of coastal vegetation ecosystems. The development of coastal areas during the high-growth period significantly reduced seagrass beds and tidal flats, which is believed to have impacted biological production. To address this, we developed a seagrass bed-building reef to restore seagrass beds, confirming its high effectiveness. We are now conducting research to use this method to restore algal beds in coastal areas, aiming to combat climate change by sequestering carbon dioxide and promoting local economies through carbon credits and measures against seaweed decline.

Keywords	Inland Sea, aquatic environment, aquatic ecology, seagrass beds, blue carbon