



# NOAA FISHERIES

## Office of Aquaculture



**Ecosystem Services** include four categories<sup>3</sup>:

**Provisioning:** products obtained directly from the ecosystem (e.g., oysters harvested to eat).

**Regulating:** benefits obtained through the regulation of ecosystem processes (e.g., oysters contribute to water clarity and nutrient cycling).

**Supporting:** services necessary for the production of other services (e.g., oyster reefs and farms provide habitat for other species).

**Cultural:** nonmaterial benefits provided by an ecosystem (e.g., community identity associated with oyster fisheries.)

**Learn more:**  
[fisheries.noaa.gov/aquaculture](https://fisheries.noaa.gov/aquaculture)

# Shellfish Aquaculture and Cultural Ecosystem Services



*An oyster farmer places a bag of oysters on a shellfish farm in Wellfleet, Massachusetts. Shellfish farms can provide jobs and the opportunity to work outdoors or on the water. Credit: Adriane Michaelis/NOAA Fisheries*

## Cultural Ecosystem Services

Cultural ecosystem services, a category of ecosystem services, are the contributions ecosystems make to human well-being in terms of the **identities** they frame, the **experiences** they enable, and the **capabilities** they equip.<sup>1</sup>

### SHELLFISH AQUACULTURE

Shellfish aquaculture involves the cultivation or farming of shellfish, such as clams, oysters, and mussels. It is a growing industry across the coastal United States and its growth is in part due to the multitude of ecosystem benefits bivalve shellfish provide. Examples include improved water quality, shoreline protection, and habitat provision, in addition to providing a healthy source of protein.

Recent research shows that bivalve shellfish also provide cultural ecosystem services and related benefits (Table 1). These benefits - identities, experiences, and capabilities - exist at both the individual and the community level.

### IDENTITIES SHAPED THROUGH WORK WITH SHELLFISH

Fisheries provide a sense of place to working waterfront communities, in addition to shaping individual and community identities. Shellfish aquaculture can do the same, extending cultural and family heritages while helping to sustain working waterfronts and associated businesses. Farming shellfish also enables a sense of stewardship or caretaking both for the “crop” (i.e., the shellfish) and the waters where the farm is located.



*Shellfish farmers are caretakers and are often proud of the final product, like this freshly shucked farmed oyster. Credit: Adriane Michaelis/NOAA Fisheries*



A working waterfront in Ocean City, Maryland. Credit: Adriane Michaelis/NOAA Fisheries

## SOCIAL IMPACT OF AQUACULTURE

Cultural ecosystem services represent one approach to detail the ways that shellfish aquaculture can affect a community. To equitably and sustainably advance aquaculture, it is imperative to understand the social and cultural impacts of aquaculture siting and development.

NOAA scientists are working with industry members and engaging local stakeholders to document the ways that aquaculture has influenced local communities, as well as discuss potential future impacts.



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**TABLE 1. CULTURAL ECOSYSTEM SERVICES ENABLED THROUGH WORK WITH SHELLFISH**

Cultural ecosystem services enabled through work with shellfish are presented as associated identities, experiences, and capabilities.<sup>2</sup>

## Cultural Ecosystem Services Enabled through Work with Shellfish

Benefit Category	Sub-Category	
<b>Identities</b>	Contribution to community	Responsibility of care - environment
	Cultural heritage	Responsibility of care - husbandry
	Family heritage	Sense of belonging
	Novel occupation	Sense of place
	Occupation	Sense of purpose
<b>Experiences</b>	Adventure	Safety
	Aesthetic appreciation	Security and reliability
	Challenge	Shared experiences
	Independence	Social capital
	Innovation	Spiritualism
	Job satisfaction	Therapy
	Lifestyle	Transformation
	Pride	Variety
	Relationship with nature	
<b>Capabilities</b>	Income	Physical health
	Knowledge	Skills
	Mental health	



Some communities, like Cedar Key, Florida, are known for their farmed shellfish. Here, freshly harvested clams are stacked ready to move to the processor. Credit: Adriane Michaelis/NOAA Fisheries

### EXPERIENCES ENABLED THROUGH WORK WITH SHELLFISH

Beyond opportunities to spend time in nature, work in shellfish aquaculture challenges individuals and inspires innovative adaptations and technology. In some cases, farming shellfish represents a more stable source of income than other jobs that could provide similar levels of pride and satisfaction.

### CAPABILITIES ENHANCED THROUGH WORK WITH SHELLFISH

In addition to a source of income, shellfish aquaculture gives individuals the opportunity to improve their own knowledge, skills, and health and of those they train and with whom they interact.

### REFERENCES

1. Fish et al. "Conceptualising Cultural Ecosystem Services: A Novel Framework for Research and Critical Engagement."
2. Michaelis et al. "Cultural Ecosystem Services Enabled Through Work with Shellfish."
3. Millennium Ecosystem Assessment. "Ecosystems and Human Well-being."
4. NOAA Fisheries. "Fact Sheet: Aquaculture Provides Beneficial Ecosystem Services."