Shellfish Association of Great Britain

The Future of the UK Shellfish Industry: Opportunities Amidst Changing Climates

Introduction

The global shellfish industry is facing mounting challenges due to climate change, particularly in Southern Europe, where countries like Spain dominate mussel production. Rising sea temperatures, altered algae blooms, and increased freshwater runoff have severely disrupted shellfish farming, leading to record-low harvests. In 2023, Spain—the largest mussel producer in Europe and the second largest in the world—experienced historically low yields, while Italy, the EU's third-largest producer, is on the brink of declaring a state of emergency for its shellfish industry.

Amidst these challenges, the UK shellfish industry stands at a potential turning point. Just as the UK's wine sector is expected to benefit from a warming climate, the country's cooler and more stable waters could offer a favourable environment for shellfish farming. As climate change reshapes European aquaculture, the UK has a unique opportunity to expand its role as a key producer. However, realising this potential will require strategic investment and government support. With this in mind, there is an urgent need for DEFRA to champion sustainable aquaculture development, ensuring the UK shellfish industry is well-positioned to thrive in the years ahead.

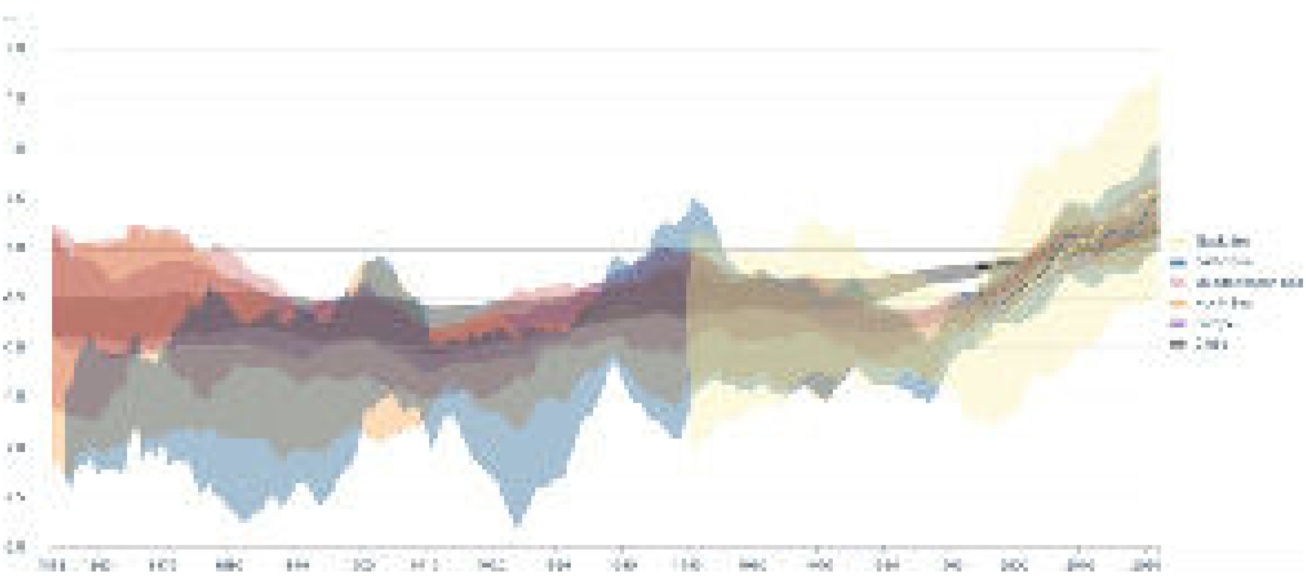

***Fig. 1**. Decadal average sea surface temperature anomaly in different European seas: Time series (1870-2022) of decadal average observed*

Impact of Climate Change on Southern European Shellfish Production

Spain and Italy together account for approximately 60% of Europe's total mussel production.

In 2023, Spain's mussel production was severely affected by a marine heatwave, particularly in the Ebro Delta region. Water temperatures peaked at nearly 31°C, causing mass mussel die-offs. Initial estimates indicate losses of around 150 tons of commercial mussels and 1,000 tons of young stock, amounting to millions of euros in economic damage. The Ebro Delta, which typically produces around 3,500 tons of mussels annually, suffered a substantial drop in output, significantly impacting Spain's shellfish sector.

Beyond direct mortality, changing climate conditions are also reducing the availability of natural feed in the water, which is critical for mussel growth. This decline in plankton abundance is leading to lower mussel meat yields, further exacerbating economic losses. As a result, mussel growers in the region were forced to replace their losses by purchasing stock from Italy and Greece to meet customer demand. This growing reliance on external suppliers underscores the vulnerability of Southern European shellfish production and raises concerns about long-term sustainability in the face of worsening climate conditions.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Evol. 2020/11
ES	208.849	203.890	162.249	220.644	225.566	216.023	241.871	242.735	228.222	204.492	-2%
FR	69.098	81.659	77.958	63385	59.913	51.027	51.668	49.109	60.721	61.378	-11%
IT	79.520	63257	64235	63.700	52.526	57.806	62:502	61.941	53.324	50913	-36%
NL	36.700	40.000	37.112	54.100	54.211	53.175	43.969	45.482	38.094	32.420	-12%
DK	34.983	39.963	38.300	43.093	47.089	44.943	43.058	42.248	43.630	28.548	-18%
EL	17.240	16.679	18.720	16.752	18.645	23.359	19.240	22.003	23.733	19155	+11%
IE	22.671	19.984	18.949	12222	18.645	16.156	17.110	13.889.	15.184	14.729	-35%
DE	20.830	13883	5.036	5.280	25.476	66.748	16.856	15.864	22.037	13490	-35%
	6.156	6.153	7.618	6.945	7.720	9118	7.936	5.681	7.513	5.624	-9%
EU-27	496.047	485.468	430.177	486.121	507.396	538.355	504.210	498.950	492.458	430.749	-13%

Note: Green for positive evolution (2011-2020) and red for negative evolution

Table 1: Evolution of mussel production in main producing European states (source: EUROSTAT)

Opportunities for the UK Shellfish Industry

Climate Shift Favors UK Production

With governments worldwide struggling to tackle the escalating climate crisis, global temperatures are set to rise further. This trend will continue to disrupt industries that rely on stable environmental conditions, including shellfish aquaculture.

However, the UK's cooler and more stable waters offer a significant opportunity for expansion in mussel and oyster farming. If the decline in Spanish and Italian production continues as projected, a substantial gap in the EU's shellfish market could emerge, positioning the UK as a key alternative supplier. Expanding the industry now could establish the UK as a reliable producer, ensuring long-term market stability and economic benefits.

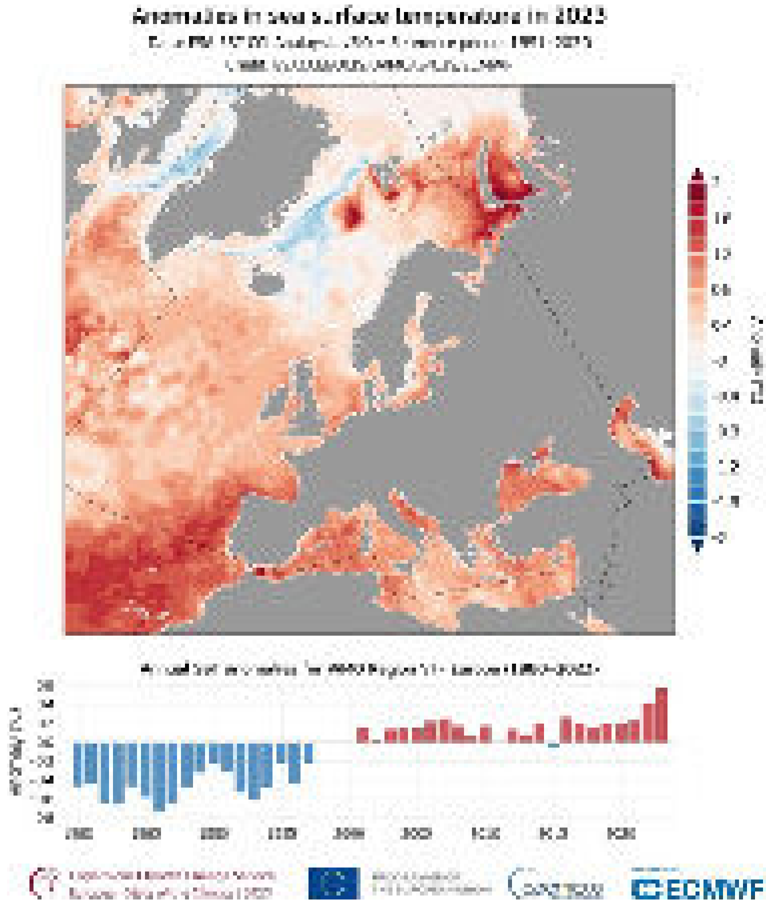

Fig 2. *(Top) Annual average sea surface temperature anomalies (°C) for 2023, relative to the average for the 1991–2020 reference period. (Bottom) Annual average sea surface temperature anomalies (°C) for 1980 to 2023, relative to the average for the 1991–2020 reference period. Data source: ESA SST CCI Analysis v3.0. Credit: ESACCI/EOCIS/UKMCAS and C3S/*

Government and DEFRA Support

Despite the UK's potential to increase shellfish production, realising this opportunity will require proactive government support. The Department for Environment, Food & Rural Affairs (DEFRA) must address several domestic challenges that currently hinder aquaculture growth. These include restrictive policies, concerns over water quality, competition for marine space, and a complex licensing system that slows industry development. To capitalise on climate-driven market shifts, the UK must invest in sustainable aquaculture practices, research, and modern infrastructure. Streamlining licensing processes, improving water quality monitoring, and providing financial incentives for shellfish farmers could accelerate industry growth. With strategic government intervention, the UK could strengthen its position as a leading European shellfish producer, securing economic and environmental benefits for coastal communities.

Challenges and Considerations

Sustainability and Environmental Concerns

Mussel farming is one of the most sustainable forms of protein production, requiring no feed inputs and producing minimal carbon emissions. Expanding the UK's shellfish industry would provide a low-impact, climate-friendly alternative to more resource-intensive seafood production.

Economic and Market Factors

The viability of an expanded UK shellfish industry will depend on economic and market conditions. Competition from EU countries, fluctuating demand, and trade barriers post-Brexit could influence the industry's success. Additionally, investment in export infrastructure, marketing strategies, and trade agreements will be necessary to secure international buyers and establish the UK as a preferred supplier within the European market.

Conclusion

Summary of Potential

The UK has a unique opportunity to expand its shellfish industry as climate change disrupts traditional production areas in Southern Europe. With cooler, more stable waters, the country is well-placed to fill gaps in the EU market, provided that key challenges—such as regulatory barriers, environmental sustainability, and infrastructure needs—are addressed.

To fully capitalise on this opportunity, further research, industry collaboration, and strong government support are required. DEFRA and other regulatory bodies must prioritise investment in sustainable aquaculture, streamline policies, and enhance environmental protections. By taking proactive steps now, the UK can secure a thriving, resilient shellfish industry for the future while ensuring ecological sustainability.