

## Shellfish water microbiology



### Key message

The outcomes of the 2019/20 classification showed that 59% of shellfish growing waters had the highest possible microbiological standards of water quality (Class A). This was an improvement from 40% reported in 2011. Only one region contained shellfish areas with the lowest standard (Class C).



### Background

Shellfish, such as mussels and oysters, filter large volumes of water to obtain food. During this process they can concentrate organisms (bacteria and viruses) in their bodies, some of which may be harmful to humans (pathogens). Such organisms can be present due to contamination with sewage or animal faeces (faecal contamination). If raw or lightly cooked shellfish contaminated with a pathogen was eaten by a consumer, it could cause illness, such as vomiting and diarrhoea.

Levels of faecal contamination in shellfish collected from production areas (PAs) are monitored by Food Standards Scotland (FSS)

as prescribed in the European Regulation (EU) 2017/625. *E. coli* is used as an indicator of this contamination and, as such, of water quality.

Classifications are awarded according to the FSS Protocol for Classification and Management of *E.coli* results (FSS, 2019a). There are three classes of water quality within the classification system - A, B and C, with A being the highest quality (cleanest waters) and C the lowest.

Depending on class, treatment of shellfish may be required before it is placed on market. Shellfish from class A waters may go directly to consumer without any further treatment, while

shellfish from class B waters must undergo purification (by placing in tanks with clean water for a specific time) or cooking, and shellfish from class C waters must be cooked. Harvesting will be prohibited from areas where *E. coli* exceeds certain levels prescribed in the regulation.

FSS works with the Scottish Environment Protection Agency to identify any areas showing signs of deteriorating water quality.

## Results

Eight Scottish Marine Regions (SMRs), Shetland, West Highland, Outer Hebrides, Argyll, Forth and Tay, Clyde, North Coast, Solway, had classified shellfish PAs. The 2019/20 classification for each of these locations (2016- 2018 data) is shown in Figure 1. Only SMRs with five data points were included in the regional assessment. Of the eight SMRs with shellfish PAs, six had sufficient data points, Solway and North Coast had insufficient data.

The percentage of each classification category was calculated for each SMR, and is shown in Figure 2. Shetland contains the highest percentage (89%) of Class A shellfish PAs. The only SMR to contain any Class C areas is Argyll (2/11 PAs). Water quality will depend on the impact from human and animal pollution sources, which will vary depending on location.

Shellfish water quality was assessed for Scotland's Marine Atlas (Baxter *et al.*, 2011). The 2009/2010 classification showed that 40% of PAs were Class A all year round. In the current assessment, 59% of all PAs across Scotland were Class A, which is a marked improvement.

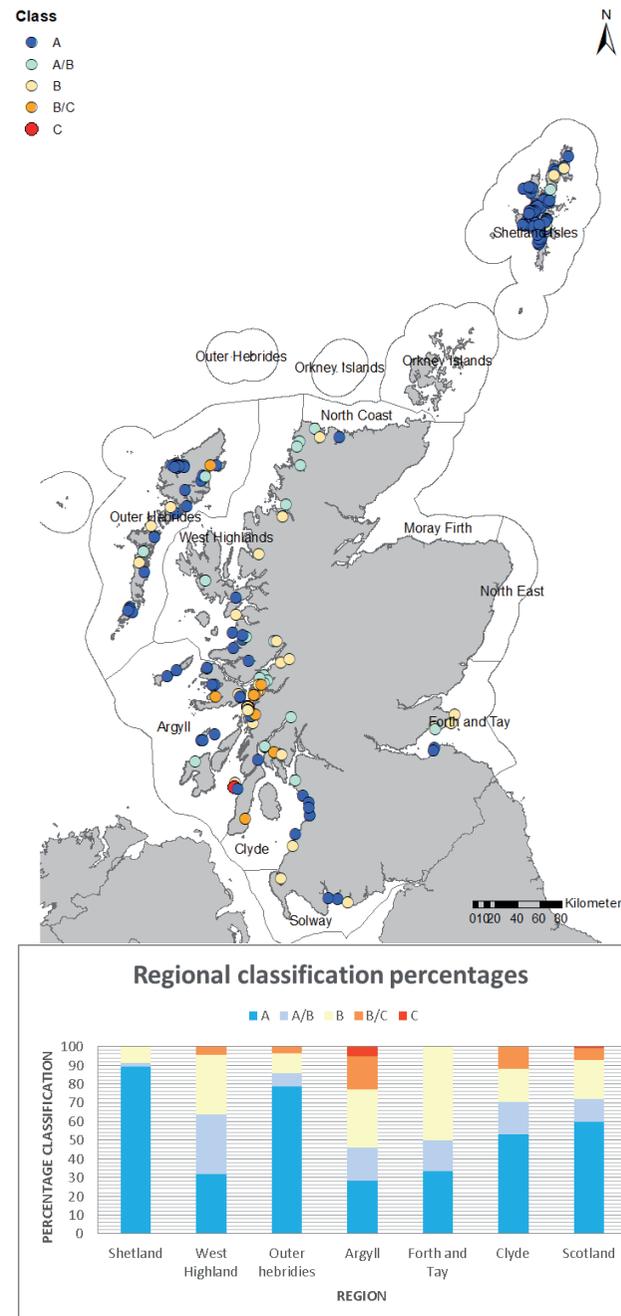


Figure 2: Percentage of classification categories of shellfish production areas in six SMRs and for Scotland. Class A is highest quality and Class C the lowest.

The full details of the results of the E.coli monitoring are already published. E.coli results are also available on the Scotland's aquaculture website and on the FSS website.

## **Conclusion**

The overall microbiological water quality of shellfish PAs is good, with 59% Scottish PAs being designated as Class A. Shetland had the highest percentage of Class A products (89%). For five of the six SMRs assessed, over 50% were designated Class A or A/B, with Class A products being of sufficient microbiological quality to be placed directly on the market without further processing.

## **Knowledge gaps**

There are several regions with either no data or very few data points. This is due to the location of classified shellfish areas as FSS only monitor areas with classified shellfish harvesting activity. There are also 2 SMRs (Solway and North Coast) that have insufficient data for a regional assessment.

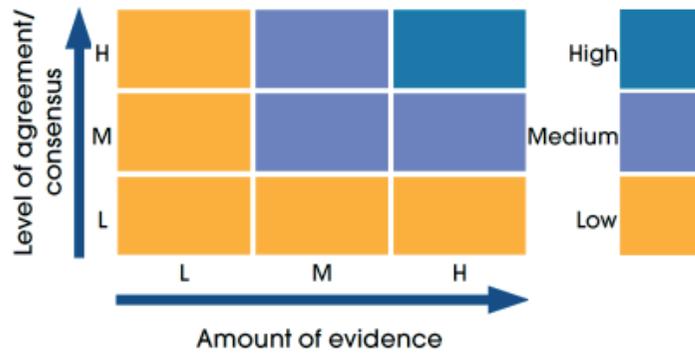
## **Status and trend assessment**

Traffic light assessments are not appropriate for this assessment due to the lack of assessment criteria and the small number of production areas in each SMR.

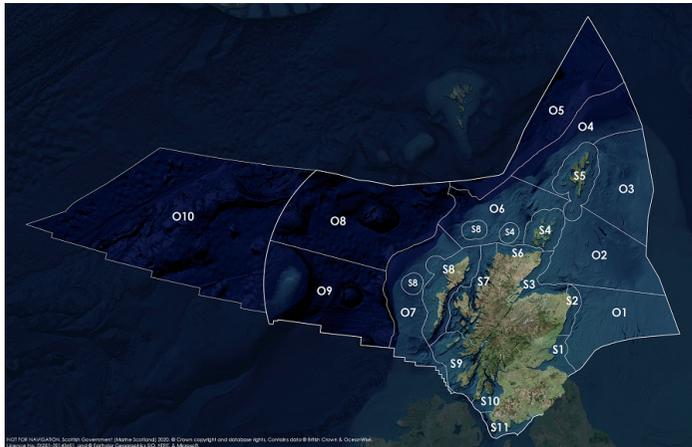
## Status and trend assessment legend

Status assessment (for Clean and safe, Healthy and biologically diverse assessments)		Trend assessment (for Clean and safe, Healthy and biologically diverse and Productive assessments)	
	Many concerns		No / little change
	Some concerns		Increasing
	Few or no concerns		Decreasing
	Few or no concerns, but some local concerns		No trend discernible
	Few or no concerns, but many local concerns		All trends
	Some concerns, but many local concerns	<b>Confidence assessment</b>	
	Lack of evidence / robust assessment criteria		
	Lack of regional evidence / robust assessment criteria, but no or few concerns for some local areas		Low
	Lack of regional evidence / robust assessment criteria, but some concerns for some local areas		Medium
	Lack of regional evidence / robust assessment criteria, but many concerns for some local areas		High

## Overall confidence



## Assessment regions

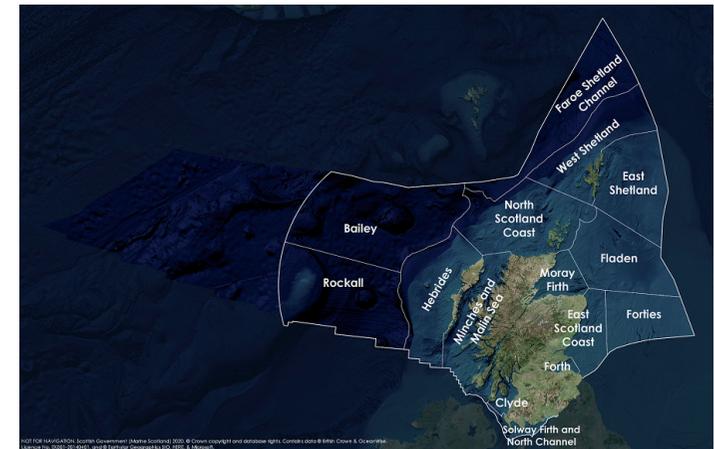


The Scottish Marine Regions (SMRs; S1 - S11) and the Scottish Offshore Marine Regions (OMRs, O1 - O10)

Key: S1, Forth and Tay; S2, North East; S3, Moray Firth; S4 Orkney Islands, S5, Shetland Isles; S6, North Coast; S7, West Highlands; S8, Outer Hebrides; S9, Argyll; S10, Clyde; S11, Solway; O1, Long Forties, O2, Fladen and Moray Firth Offshore; O3, East Shetland Shelf; O4, North and West Shetland Shelf; O5, Faroe-Shetland Channel; O6, North Scotland Shelf; O7, Hebrides Shelf; O8, Bailey; O9, Rockall; O10, Hatton.



Biogeographic, Charting Progress 2 (CP2) Regions. These have been used as the assessment areas for hazardous substances.



Scottish Sea Areas as used in Scotland's Marine Atlas 2011. These are sub divisions of the biogeographic, or Charting Progress 2 (CP2), Regions.