

COCKLES

Co-Operation for Restoring Cockle Shellfisheries
and its Ecosystem-Services in the Atlantic Area

Understanding the value of some
ecosystem services from cockles

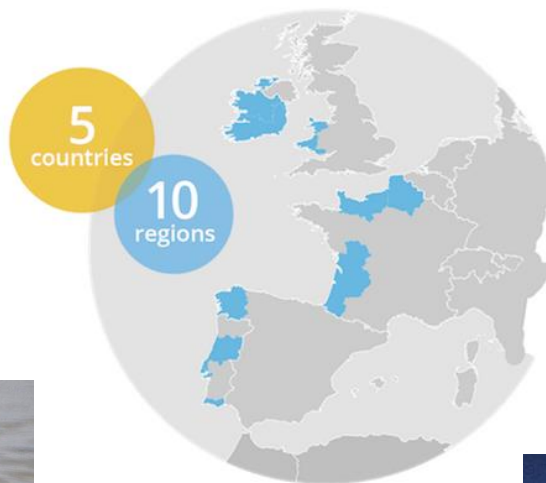
UKCEH and COCKLES partners

FINAL VIRTUAL CONFERENCE

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The common cockle provides a wealth of services to coastal communities in the Atlantic Area.



Food



- Human have consumed cockles since Neolithic times.
- Part of an international industry, which supports long-established livelihoods in coastal communities.
- A tonne of fresh living cockle: 1,000 € to 5,700 €

Shell by-products

- Cockle shells can be used for: chicken grit, aggregate and ornamental uses.



Cockles affect marine processes (Regulating services)

From cockles underwater:

Water filtration

- Healthy and productive cockle beds can filter large volumes of water and improve water quality.

Erosion control

- The burrowing action of cockles can make the bottom sediment more or less prone to erosion.



From harvesting cockles:

- Cockles lock up **carbon** in their shell.
- Both **nitrogen** and **phosphorus** are assimilated by cockles for tissue and shell growth.



These processes can remove nutrients and reduce eutrophication and harmful algal blooms in coastal waters.

Supporting services

Food source for wildlife

- Cockles are also an important food source for many wading birds, especially in winter.
- As well as for finfishes and other marine animals, both during the planktonic (larvae) and benthic (juveniles and adults) cockle life stages.



A strong place-based identity, around the history, heritage and cultural associations of people with this important shellfish.

- Rich and diverse examples among the 5 countries.
- cultural associations with cockles differed among countries.
 - Northern countries more historical
 - Southern countries deeper in present culture



Cockle cultural services can be grouped under 7 categories.

We found over 230 examples

Inspirational



Aesthetic



Spiritual & religious



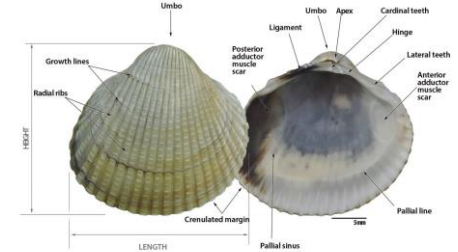
Recreation & ecotourism



Sense of place



Educational



Cultural heritage



Harvest-based services

Currency	€	(drop-down menu)
Year	2019	

Input your data here			
Site	Country (drop-down menu)	Year	Fresh weight (t) (TWW)
	UK	2018	8,100.00
	Spain	2009	3255.329
	Portugal	2005	2391
	Ireland	2007	643
	France	2013	2,749.69

- The user enters data in spreadsheets Harvest-based services:

- Location
- Year
- Fresh weight of cockles

The user choose the currency and the preferred year for economic valuation.

Harvest-based services

Outputs									
Landing (Live animals)		Shell		N remediated		P remediated		Carbon removed	
Amount (t)	Economic value	Amount (t)	Economic value for aggregate (central estimate)	Amount (t)	Economic value	Amount (t)	Economic value	Amount (t)	Economic value (central estimate)
	€		€		€		€		€
8,100	6,437,133	3,260	4,589,257	25	321,114	3	25,950	449	112,627
3,255	14,053,514	1,310	1,844,388	10	118,054	1	10,429	180	40,535
2,391	3,027,380	962	1,354,681	7	92,135	1	7,660	132	29,772
643	1,472,968	259	364,308	2	25,529	0	2,060	36	8,007
2,750	9,891,250	1,107	1,557,905	8	101,625	1	8,809	152	34,239

- The outputs on several services will be automatically calculated:
 - Market values = the economic values of live animals
 - Non-market values = Potential ecosystem services values: price of shell as aggregate, the price of nitrogen and phosphorous removal as well as carbon sequestration in the cockle shell and flesh.



In-situ services

The user enter information specific to their site into the in-situ sheet:

Input your data here								
Location	year	Site	m ² Site area	% Percent age of site area at this density	mm Size class of cockle	n cockles m ⁻² Density: Number of cockle per size class per m ² (if no such information, leave it blank (not zero)	g.m ⁻² Biomass per size class per m ² (if no biomass given leave it blank (not zero)	log of mg.m ⁻³ Chlorophyll-a concentration (to retrieve concentration click on the link below and find the site on the map) map of Chl-a
Arcachon	2018	Banc_dArg	10000	100	smaller than 10 mm	0		0.443
Arcachon	2018	Banc_dArg	10000	100	10 - 15 mm	0		0.443
Arcachon	2018	Banc_dArg	10000	100	16 - 20 mm	0		0.443
Arcachon	2018	Banc_dArg	10000	100	21 - 25 mm	150		0.443
Arcachon	2018	Banc_dArg	10000	100	26 - 30 mm	0		0.443
Arcachon	2018	Banc_dArg	10000	100	31 - 35 mm	0		0.443
Arcachon	2018	Banc_dArg	10000	100	36 - 40 mm	0		0.443
Arcachon	2018	Banc_dArg	10000	100	greater than 41 mm	0		0.443
Aveiro	2011	Barra	20000	100	smaller than 10 mm		1	0.672
Aveiro	2011	Barra	20000	100	10 - 15 mm		1	0.672
Aveiro	2011	Barra	20000	100	16 - 20 mm		1200	0.672
Aveiro	2011	Barra	20000	100	21 - 25 mm		3400	0.672
Aveiro	2011	Barra	20000	100	26 - 30 mm		0	0.672
Aveiro	2011	Barra	20000	100	31 - 35 mm		0	0.672
Aveiro	2011	Barra	20000	100	36 - 40 mm		0	0.672
Aveiro	2011	Barra	20000	100	greater than 41 mm		0	0.672

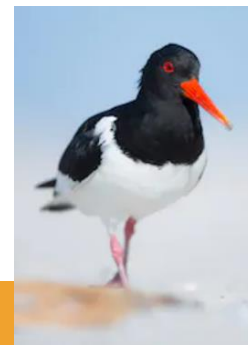


In-situ services

The outputs specific to the site will be automatically calculated:

Outputs				
l.d^{-1}	t.d^{-1}	t.y^{-1}	t.y^{-1}	n
Volume of water (liter) cleared per day at a site	Amount of phytoplankton (tonne) cleared per site in a day	Amount of phytoplankton (tonne) cleared per site in a year	Potential Nitrogen (tonnes) removed in a year	Estimated number of oystercatcher feeding at this site over a winter period
12,729,679	35	12,886	180,401	10
169,676,660	797	291,015	4,074,206	70

- Volume of water cleared
- Amount of phytoplankton cleared
- Potential Nitrogen removed
- Potential number of oystercatcher feeding at this site.



Ecosystem services leaflets





Thank you for listening