

# Tracking the leatherback

Giant leatherback turtles in UK waters? Expect to see more in the future says Graeme Hays.

It's mid-August and we're flying over the Welsh coast as part of our aerial survey programme. A few hundred metres from Rhossili beach on the Gower peninsula we spot a two-metre-long leatherback turtle swimming strongly into Carmarthen Bay.

The shores of the UK and Ireland might seem like a strange place to go looking for turtles – surely the place to find turtles is in the tropics? But every year giant leatherback turtles come to our shores. Where they come from and why they come here have been central questions for my research group in Swansea University in recent years.

Leatherback turtles are critically endangered with precipitous declines in populations in some parts of the world. These are attributed to a combination of collection of eggs for human consumption and incidental mortality of adults and juveniles in various types of coastal and open-ocean fishing gear.

Learning about leatherback movements

## Leatherback turtles come to the UK and Ireland to feed on dense jellyfish blooms.



Graeme Hays and PhD student Vicky Hobson, talking about leatherback turtles at the Welsh National Eisteddfod.

is of more than just intrinsic scientific interest: it may also help conserve the species by identifying high-risk areas for fishing.

To understand leatherback turtle movements, we initially attached satellite tags to nesting females in the southern Caribbean in 2002 and 2003. We followed nine turtles for up to 18 months using tags developed at the Sea Mammal Research Unit in St Andrews.

To our surprise turtles dispersed widely throughout the North Atlantic. Some remained in the tropics, but others rapidly

travelled up to northern latitudes, some approaching close to the UK and Ireland.

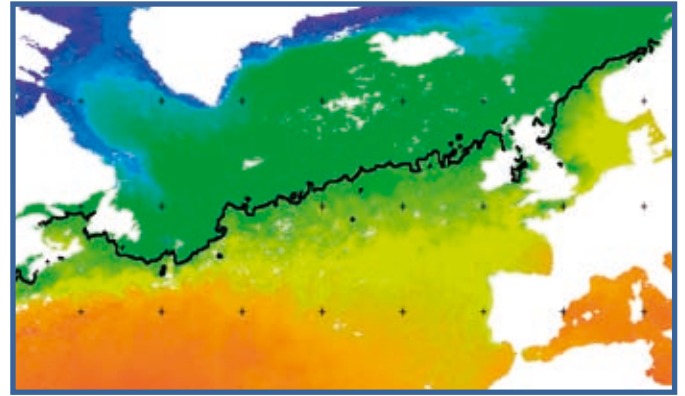
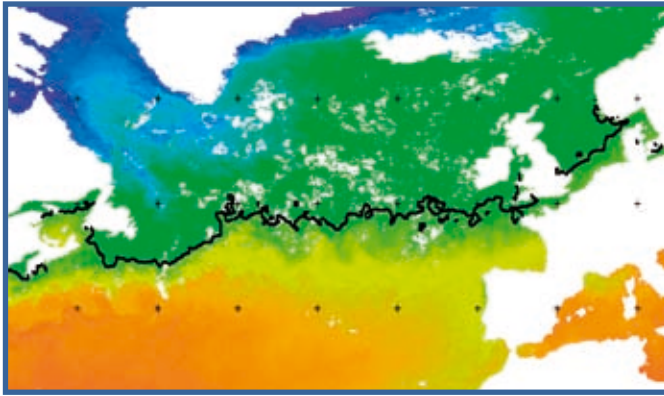
It was clear from these studies that leatherbacks travelled to high latitudes as a result of directed travel – they did not wander around the Atlantic and eventually roll up in northern waters. Clearly there must be some underlying reason for these extended movements.

In 2003, we began an aerial survey programme in collaboration with University College Cork and with funding from the EU, to investigate why turtles travel to cold northern waters. We wanted to assess jellyfish distribution, the leatherback's main source of food.



Left: Fancy a bite? *Rhizostoma* jellyfish, which weigh up to 30kg, are prime food for leatherback turtles. This jellyfish was washed ashore on a Gower beach. Right: Ocean giant: a leatherback turtle equipped with a satellite tag to record its movements for up to 18 months.

The position of the 15°C surface isotherm in 1985 (left) at its most southerly and in 2000 (right), at its most northerly.



‘Counting jellyfish from the air – you must be mad!’

This was the message that greeted us when I explained our sampling plans to plankton biologists.

Yet the traditional tool of the plankton biologist – towing nets behind ships – has proved remarkably unsuccessful with jellyfish because they are extremely patchily distributed. We needed to develop a new approach to sampling. Aircraft cover more ground and potentially get around patchiness problems.

But can you count jellyfish from the air? Apparently not, according to popular belief.

Our first aerial survey of the Welsh coast quite literally changed our view. We estimated that we saw more than 200 million jellyfish on that first flight (plus or minus a few million). The jellyfish were giant white jellyfish of the genus *Rhizostoma* – prime food for a leatherback turtle.

The aerial survey approach clearly worked well for this species of jellyfish, and we proceeded to fly thousands of miles to establish the jellyfish distribution in the Irish Sea. Repeated aerial surveys during 2003, 2004 and 2005 always showed that the *Rhizostoma* jellyfish congregated in two hotspots on the Welsh coast – Carmarthen Bay in the south and Tremadog Bay in the north.

These high concentrations of jellyfish might be expected to lead to localised residence of leatherback

turtles

in these bays. But

how to test this idea? Certainly

we saw a few leatherback turtles on our

flights – always in the jellyfish hotspots

– but our leatherback sightings were rare,

understandable given that the species is

critically endangered. We needed more eyes

scanning the sea for us.

Luckily, there is a UK database of leatherback sightings made by the public going back many years. Analysis of this database confirmed our prediction – the jellyfish hotspots were indeed also hotspots for leatherback turtle sightings.

So it seems that leatherback turtles come to the UK and Ireland to feed on dense jellyfish blooms. But why don't they stay here all year round?

Sightings of leatherback turtles occur mainly in August and September – when the water is warmest. Our satellite tag results painted a similar picture – our tracked animals always turned south once they encountered water around 15°C. While leatherbacks are seasonal visitors to our

## ‘Counting jellyfish from the air – you must be mad!’

shores, limited by water temperature, data suggests that their range is expanding due to climate change.

Using remote sensed imagery supplied by the NERC Earth Observation Data Acquisition and Analysis Service (Plymouth Marine Laboratory), we traced the position of the summer 15°C isotherm over the last few decades. The analysis revealed that this isotherm, which essentially approximates the northerly limit of leatherbacks, has moved north by around 330 kilometres in the last 20 years.

The implication is that the UK and Ireland are progressively lying further within the normal range of the species.

So the messages are clear – if you visit

the coast in the summer, keep your eyes peeled for leatherback turtles, and if you are flying low over the ocean (less likely admittedly for most people) look out for jellyfish aggregations. If you see either leatherbacks or jellyfish, please let us know via our online reporting form:

[www.turtle.ie/](http://www.turtle.ie/) ❖

### FURTHER READING

Swansea University turtle research:  
[www.swan.ac.uk/bs/turtle/](http://www.swan.ac.uk/bs/turtle/)

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Graeme recently received a NERC urgency grant for an application entitled: *Extraordinary and unprecedented abundance of the oceanic jellyfish in the Irish Sea.*