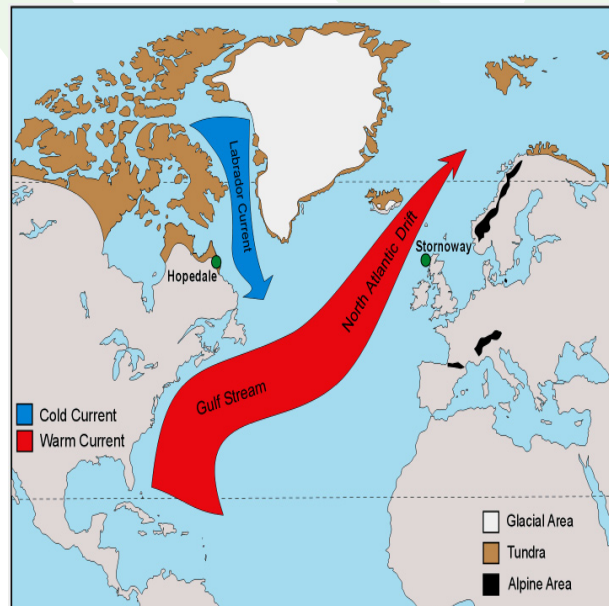


# Dive-Shield Eco-News

The Gulf Stream starts in the Gulf of Mexico and carries warm water east then north through the Straits of Florida and across the North Atlantic. Halfway across the ocean it splits into two, with one section flowing south towards Africa and another towards northern Europe. When the northern current reaches the Arctic, its waters have become colder and more saline, making them denser, which causes them to sink. A deep current of coldwater then flows back towards the Gulf of Mexico, where the process begins all over again.



Global warming is thought to slow this process, as freshwater from melting ice reduces the salinity of the Arctic waters, slowing down the rate at which it sinks.

Scientists from the UK's National Oceanography Centre in Southampton have measured the speed of current flow from North Africa to the Bahamas across latitude 25 degrees north, and on comparing the results with previous data have found that although the outward flow of the Gulf Stream has not changed the strength of the cold water returning from the Arctic has fallen by 30% since 1992.



## Weakening Gulf Stream

A report by Lee Garner

For as long as we can remember, the UK has had a milder climate than similar latitudes such as that at Labrador on Canada's east coast. The reason for this is the Gulf Stream, part of the great Atlantic conveyor that carries warmer water north from the tropics.

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Over the same period, the flow of warm water branching off the Gulf Stream towards Africa has increased by 3%. This suggests that the current's warm waters are being diverted to the south and away from Europe, so Europe's climate could become colder.

Though scientists do not think that the currents will stop completely, average temperatures in the UK could drop by between 4°C (7.2°F) and 6°C (10.8°F) in 20 years.

The Atlantic Ocean "conveyor belt" that carries warm water north from the tropics has weakened by 30 per cent in just 12 years, scientists have discovered. The findings, from the National Oceanography Centre in Southampton, give the strongest indication yet that the Europe's central heating system is breaking down under the impact of global warming. Scientists have long



predicted that melting ice caps could disrupt the currents that keep Britain at least 5C (9F) warmer than it should be, but the new research suggests that this is already underway. It points to a cooling of 1C (1.8F) over the next decade or two, and an even deeper freeze could follow if the Gulf Stream system were to shut down altogether.

The British Isles lie on the same latitude as Labrador on Canada's east coast, but are protected from a similarly icy climate by the Atlantic conveyor belt. Its currents carry a million billion watts of heat across the ocean the equivalent of the output of a million power stations. Though oceanographers still think it unlikely that the

currents will stop completely, this could reduce average temperatures by between 4C (7.2F) and 6C (10.8F) in as little as 20 years, far outweighing any increase predicted as a result of global warming. Even a lower fall in temperatures could mean Britain gets colder even as the rest of the world warms up, and would severely disrupt the Government's plans for mitigating the effects of climate change.

The Gulf Stream begins in the Gulf of Mexico and carries warm water north and east, through the straits of Florida and across the North Atlantic. Halfway across the ocean, it branches into two, with one current flowing south towards Africa and another drifting towards northern Europe. By the time the northern current reaches the Arctic, its waters have become colder and more saline, causing them to sink. A vast under-sea river of cold water then flows back towards the Gulf of Mexico, where the process begins again.

Global warming is predicted to disrupt this process, as extra freshwater from melting ice caps and glaciers reduces the salinity of the Arctic waters, stopping it from sinking, and breaking the circuit. To assess whether this is already happening, the Southampton team measured current flow across a latitude of 25 degrees north. The original Gulf Stream, cold water returning from the Arctic, and the southern branch of warm water all cross this line stretching from north Africa to the Bahamas. Measurements taken in 2004 were compared with data collected in 1957,

1981, 1992 and 1998. The results, published in the journal Nature, show that while the outward flow of the Gulf Stream has not changed, the strength of the cold water returning from the Arctic has fallen by 30% since 1992. Over the same period, the flow of warm water branching off the Gulf Stream towards Africa has increased by 30%. This suggests that the current's warm waters are being diverted to the south and away from Europe, with potentially serious consequences for the continent's climate.

HSE Warns Divers Against Dangerous, Illegal Fishing Methods

The Health and Safety Executive (HSE) has

warned divers of the risks of using unsafe electrical equipment underwater during commercial fishing operations. The warning comes after a multi-agency investigation into illegal diving for razor fish (spoots) off Argyll and Bute on the west coast of Scotland. The investigation revealed that some fishermen operating in the area are dropping electrified cables, which consist of several un-insulated metal electrodes, into the water that are then dragged by the vessel across the seabed stunning razor fish as they go. A diver who follows the path of the cable then collects the fish. However, if the diver comes into contact or even close proximity to the electrodes there is a real risk of electrocution. In an effort to curb this unsafe diving practice and illegal fishing method, HSE, the Scottish Fisheries Protection Agency (SFPA), Maritime and Coastguard Agency (MCA) and the

Police Marine, Air and Underwater Search Units (USU) launched Operation Spoots in June 2005. A police launch and divers departed Greenock, Grand Harbour, while a Police Air Unit helicopter flew over Kilbrannen Sound and reported a suspect vessel with a diver seen in the water. The launch headed to the location but the vessel's crew may have spotted the helicopter and as a result immediately sailed back to Carradale Harbour.

A second suspect vessel, however, was identified and the police launch carrying a diver and two HSE Inspectors was dispatched to make a high-speed approach. As the launch came within sight of the fishing vessel a crew member was seen to move to the stern and throw something overboard. The vessel was approached, hailed and warned that HSE inspectors would be boarding. The location of the diver in the water was identified and the police deployed a heavy shot-line to mark the location of the dropped object as two HSE Inspectors boarded and started their investigation. The crew was asked if they were using electrical cables for fishing and after being informed that a USU was available and prepared to dive, he admitted to dumping the electrical cables and using them for catching razor fish.

After isolating the generator used to charge the cables, a USU diver searched the seabed and found that the shot-line had landed on top of the electric cables, which were then recovered. Meanwhile, onboard the vessel, HSE discovered the illegal diver was also the skipper which meant that if he had been injured there was no means of rescuing him from the water. Fur-

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thermore, this would have prevented the boat from being operated since the sole remaining crewman could not sail it single handed. As a result of the operation, a Prohibition Notice was served on the vessel operator, which immediately brought to a halt the dangerous diving practices and effectively prevented the boat from being used in a similar manner until the Notice had been satisfactorily complied with. Operators fishing for razor fish using similar methods are reputed to earn £1,500 – £2,000 per day; thus prohibiting the operation will have considerable financial repercussions for the boat's owners. Breaking the terms of an Enforcement Notice is punishable by fines not exceeding £20,000 on summons or an unlimited fine on indictment. As a follow-up to Operation Spoots, HSE, together with the MCA and Police held a meeting with boat owners, operators and divers in the Carradale area. The meeting offered an opportunity to listen to their concerns and to devise a way to work in partnership to tackle health and safety risks posed by the use of divers in commercial fishing activities. However, if necessary, HSE will come down hard on all boat operators who persist on putting divers' safety at risk by using such dangerous and illegal fishing methods. Commenting on the operation, Frank Murray, HSE Principal Inspector of Diving, said: "The close cooperation for this operation between HSE and the other responsible agencies is seen as a great success and heralds future similar operations. We are determined that dangerous commercial diving operations will be vigorously tracked down and stopped."



## Africa

Scientists Say Fissure Could Become New Ocean

Scientists from Britain, France, Italy and America. have been observing the 60km (37-mile)-long, 4m (13ft)-wide fissure that formed in just

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three weeks after an earthquake on September 14, 2005. The fissure split open in the Afar desert 1,000km (621-miles) northeast of Ethiopia's capital, Addis Ababa and it is estimated that it will take a million years to fully form into an ocean. Cindy Ebinger of the Royal Holloway University in London said, "It's the first large event we've seen like this in a rift zone since the advent of some of the space-based techniques we're now using, and which give us a resolution and a detail to see what's really going on and how the earth processes work". "We believe we have seen the birth of a new ocean basin", said Dereje Ayalew head of earth science at Addis Ababa University, who leads the team of 18 scientists studying the phenomenon. "This is unprecedented in scientific history because we usually see the split after it has happened. But here we are watching the phenomenon". The fissure is the start of a long process, eastern Ethiopia will eventually split off from the rest of Africa and a sea will form in the gap. The Afar desert is being torn from the continent by about 20mm (0.8-inches) per year.

## Indian Ocean

### Record Great White Shark Migration

A tagged female great white shark called Nicole after the Australian celebrity Nicole Kidman has been tracked for 19,000km (11,800 miles) as she travelled across the Indian Ocean from South Africa to Australia and back again in less than nine months.

Tagged with a radio transmitter, which communicated with a satellite, this the first time a shark has been known to travel this far in the open ocean. The study was conducted by researchers from the Marine and Coastal Management organization of the Wildlife

Conservation Society in New York, the University of Cape Town and the University of Pretoria in South Africa. Data transmitted by Nicole's tag showed that she spent more than 60 percent of her time swimming at the surface while she was in the open ocean. She often dived to great depths, sometimes as deep as 900m (3,000ft), but she kept almost to a straight route. Was she using her eyes to locate the moon and sun, or the Earth's magnetic field? –we do not know.

Tracking data in South Africa shows that sharks of both gender including juveniles make frequent migrations but these are generally up and down the South African coast and are thought to be related to the availability of food. Many of them return to the same spot off the Cape of Good Hope. Photo-identification records of the South African great white shark population show that Nicole has appeared in her South African home waters only between June and December since 1999 This suggests that her migration may be a regular occurrence and experts speculate that the shark was searching for a mate



rather than for food as there is plenty of prey for food in South African waters. However, Nicole is only 3.8m (12.5ft)-long. This is shorter than the length at which great white sharks are believed to reach sexual maturity, suggesting that she is not ready for mating.

### Where next?

Great white sharks are considered to be temperate water sharks but 'Tessa', a 4m (13ft) adult female tagged with a pop-off tag by a team of international and New Zealand scientists at New Zealand's Chatham Islands has travelled into waters previously thought to be mostly uninhabited by these creatures. The scientists expected her to head south or southwest to feed on sea lions, or head towards Australia but she travelled more than 1,000km (620 miles) north towards the tropics. The tag popped off about 800km (500 miles) off New Zealand's East Cape and showed that Tessa had swum this distance at the equivalent of half a kilometre per hour. Tessa must have taken a roundabout route because great white sharks normally swim at 3-4km per hour.

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## Indonesia

### Whale Shark Killed

A 7½ m (25ft) whale shark tagged with an electronic tracking-device off Ningaloo north-west Western Australia is believed to have been caught and possibly eaten in Indonesia. Satellite data has shown that the tracking device has been on land on an Indonesian island for more than three months. The animal was being tracked in a joint project involving the Western Australian government and appears to confirm that there needs to be international action to protect these beautiful creatures.

### Tsunami Aid in Aceh 'May Cause Overfishing'

The tsunami of December 2004 destroyed much of Aceh's coastline, killing thousands and destroying fishing boats. Many aid organisations arrived to help, many of them providing new fishing boats but they now realise that if the local fishing fleets become too large, fish stocks could be put at risk. The waters off Aceh are rich in tuna, which can fetch a high price commercially but the number of boats provided by aid organisations is increasing rapidly and because they are all of a similar small size they will all be operating in the same waters - close inshore.

## Australia

### New Species of Box Jellyfish Discovered

Box jellyfish are found many parts of the Pacific Ocean including Hawaii but off Australia they are encountered in nearshore waters from Exmouth in Western Australia to Gladstone in Queensland between November and May, they are possibly the world's deadliest creature. Up till now they were not thought to occur offshore but recently scientists

have discovered a new species in the outer regions of the Great Barrier Reef about 10 days after each full moon. This new species of jellyfish is thought to have stung a 27-year-old snorkeller on the face at Ribbon Reefs, east of Cooktown because the man required hospital treatment for Irukandji syndrome - there is no anti-venom.

### Minister Awards Cape To Cape Beach Clean Up

On October 24, 2005 Minister of Environment Dr Judy Edwards attended a presentation in Busselton reporting on the results of the Cape to Cape Beach Clean Up which was held along the Cape's coastline on October



. Dr Edwards said that the statistics on marine debris were shocking and the need to protect local marine life which can easily become entangled or ingest marine debris was extremely important. Dr Edwards congratulated the volunteers who participated in the clean up and also presented Cape to Cape Beach Clean Up organiser Heidi Palmer with an Award of Appreciation for her efforts to help protect the marine environment. Over 100 volunteers collected over 1,022 kg of rubbish and over 8,200 individual pieces of marine debris off the coastline in blustery winter conditions. The marine debris has been analysed and collated and will be used at a public workshop to be held on October 28th at 6.30pm at the Margaret River Community Centre, 33 Tunbridge Street.

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The workshop's main goals are to correctly identify the most common items, which were found on the beaches, find out what they are used for and then work on ways to change design or the way they are used to stop them from becoming marine debris in the first place. Volunteers and the general public are all invited to attend, as well as representatives from WAFIC, Recreational Fishing, Fisheries, DPI, CALM, the Busselton Dunsborough Shire, Augusta Margaret River Shire and Keep Australia Beautiful Council.

For more information on the Cape to Cape Beach Clean Up Workshop please contact Heidi Palmer on 0418 923 802 or email \n heidi@tangaroablue.com. This e-mail address is being protected from spam bots, you need JavaScript enabled to view it

## Protesters' Vessel Rammed

Greenpeace protesters have managed to locate Japanese vessels slaughtering whales in Australian territorial waters but one was rammed by the Japanese when the protesters tried to interfere. The six Japanese vessels were found in the Southern Ocean where they had killed at least three minke whales that morning. A helicopter filmed the killing and butchering of a minke whale on the factory ship while two more catcher-vessels



approached with harpooned whales. The Greenpeace vessels, Arctic Sunrise and the Esperanza, tried to block the catcher-vessels from reaching the loading ramp of the factory ship but as well as fending them off with water-cannons, one catcher-vessel crashed into the Esperanza and tried to push it out of the way,

# Philippines

## Greenpeace Says Sorry For Reef Damage

Greenpeace has apologised to the Philippines government for damaging 160 square metres (191 square yards) of coral when its 55m (180ft)-flagship, the motor-assisted schooner Rainbow Warrior II ran aground on a reef in Tubbataha Reef Marine Park. Greenpeace was fined PHP640,000 but blamed what it described as inaccurate navigational charts provided by the Philippines Government. Jeez, all they had to do was ask any local diver where to go!

# Belize

## Feeding Whale Sharks

Researchers from the Wildlife Conservation Society using electronic tagging on whale sharks on the Belize Barrier Reef have found that the world's largest fish dives to depths of over 1,000m (3,300ft)-deep in search of food. Scientists have long puzzled over why tropical whale sharks have an insulating layer of fat just below their skin and now they know at that depth the water is only just above freezing.



# India

## New Channel "Ecological Disaster"

Environmentalists are warning that the £300m project to dredge a shipping channel between India and Sri Lanka will be an ecological disaster, destroying coral reefs, the sea grass eaten by rare dugongs and fish stocks with the siltation. Unlike a canal on land, the dredging will never end. The channel will have to be constantly dredged to keep it open - spreading sediment that will eventually smother the coral reef systems, and prevent sunlight getting through. Sri Lankan environmentalists are furious that India did not consult their government for approval of a project that will have a severe affect on Sri Lankan waters and claim that it will be a white elephant. The finished channel, 167km (104 miles)-long and 300m (984ft)-wide, will shorten the sailing time of ships from the Arabian Sea to the Bay of Bengal by about 30 hours. Compare this with the Panama and Suez canals that save weeks of sailing and once you add in the cost of pilotage, a lot of commercial vessels will not use it.

# Pacific

## Research

Scientists have been tracking migration routes by implanting fish with tiny electronic tags, which are either scanned by sensors spread over the ocean floor or send data to a satellite when they swim on the surface. As well as giving a census of fish and their movements, it is hoped to collect enough data to control fishing fleets when species whose survival is threatened, need protecting. One bluefin tuna swam the Pacific three times in 600 days showing that American and Japanese bluefin tuna stocks were both the same.



# Asia

## Post-tsunami Research

Months after the December 26, 2004 Indian Ocean tsunami, scientists have found a 'dead zone', one devoid of fish at

its epicentre. Scientists who accompanied television crews from the BBC and Discovery Channel to investigate the earthquake, which had a magnitude of 9.3 on the Richter Scale, found that the upper tectonic plate had been lifted to produce a cliff 12m (40ft) high and hundreds of kilometres long. The energy released in displacing such a large amount of water produced the tsunami that travelled around the world three times. Other scientists using sensitive instruments on land have found that some islands in the area had been uplifted by 1.65m (65 inches). Having cut slices through the coral reef that has now been lifted above the sea, they are able to identify when tsunamis have occurred in the past.

# USA

## Groundbreaking Technology

In a groundbreaking event that maximises scientist's time and resources, scientists on land are supervising a research ship and its remotely operated submersible at sea. The brainchild of Robert Ballard who is director of an archaeological oceanography programme at the University of Rhode Island, scientists at universities in Rhode Island, Washington and New Hampshire, watch high definition video images on large plasma television screens as an unmanned

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submersible searches around 'Lost City' – an area of hydrothermal vents and a forest of limestone chimneys on the seabed at the Mid-

Atlantic Ridge. The scientists' tell engineers on the ship where to send the ROV and its high-definition video cameras, and what to explore next. Using this system, scientists do not have to waste time waiting for things to happen on the ship and if necessary, specialists can be gathered to study the pictures. With fibre optic cables, satellite feeds and high-speed Internet connections, video images transmitted by the ROV's cameras are transmitted in less than 1½ seconds to the scientists on land. When working the ROVs can operate around the clock, while the scientists work six-hour shifts. At the same time the images are being shown at museums, science centres, public aquariums and children's clubs across America.

## Dive Shield, Padi Aware & National Geographic

We're all concerned with the way that the eco system has been affected by divers and want to ensure that the reefs are here for future generations. Join the Dive-Shield eco-initiative. Consider the issues of site-to-site bacteria transfer and help Dive-Shield stop bacteria before they stop divers diving.

[project.dive@dive-shield.com](mailto:project.dive@dive-shield.com)

Report by Mark Landers.



# DIVE-SHIELD

Dive Health Initiative

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