Who goes with the flow?

A great flow of tropical water pushes southwards along the edge of Western Australia's continental shelf, sending giant swirling eddies into coastal waters and out to sea. This is the Leeuwin Current – the longest boundary current in the world, and an enormous influence on the life cycle and distribution of many WA marine species.

Free ride

Carried within the warmer waters of the Leeuwin Current are the eggs, larvae and juveniles of various tropical fishes, invertebrates and corals.

At Ningaloo Reef in autumn each year there is a mass spawning of corals. Shortly after the spawning some coral larvae settle on the reef, while other larvae are swept up by a strengthening Leeuwin Current and transported down the coast.

This explains the existence of the coral reef systems at the Abrolhos Islands and further south around Rottnest Island, as well as the presence of tropical marine life along the temperate south coast of WA.

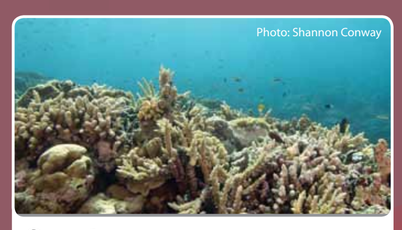


Photo: Shannon Conway

Coral

Some corals release eggs and larvae into the water in a coordinated event, called a mass spawning. At Ningaloo Reef this occurs in autumn each year, influenced by the full moon. The Leeuwin Current begins to strengthen at this time – and any eggs or larvae that have not settled on the reef are likely to be swept up by the current and transported down the coast.


Photo: Matthew Pember

Whale shark

The mass spawning of corals at Ningaloo Reef sparks a feeding frenzy that includes the massive whale shark – the largest fish in the world. More of these filter feeding sharks are seen in years when the Leeuwin Current is stronger.

Turtles

The Leeuwin Current can sweep turtle hatchlings hundreds of kilometres away from their northern nesting sites. Combined with winter storms, many hatchlings become stranded on beaches much further south.


Photo: Shannon Conway


Photo: M. Jenner, Centre for Whale Research

Pygmy blue whales

Various current systems (including the Leeuwin Current) interact around the deep, steep-sided Perth Canyon off the west of Rottnest Island and can cause upwellings of nutrient-rich water containing schools of krill. A preferred food source for pygmy blue whales, they gather here to feed, mostly between the months of December and May.


Photo: Henrique Kwong

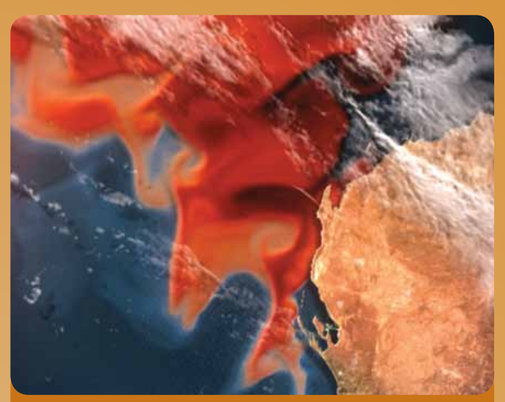
Western rock lobster

Western rock lobster larvae drift in the open ocean for nearly a year before winds and currents carry them back to the continental shelf and coastal areas. A strong Leeuwin Current normally results in higher numbers of young lobsters, called puerulus, settling on inshore reefs.


Photo: Barb Malc

Humpback whales

The Leeuwin Current acts as a 'highway' for Humpback Whales migrating from northern waters, where they mate and give birth, to their southern feeding grounds in Antarctica. Mothers and calves stop to rest at certain areas of the coast during the long trek.



The current and marine life

The Leeuwin Current is a warm, low nutrient ocean current that originates near North West Cape and flows southwards down the WA coast before turning east at Cape Leeuwin and continuing across the Great Australian Bight, even as far as Tasmania.

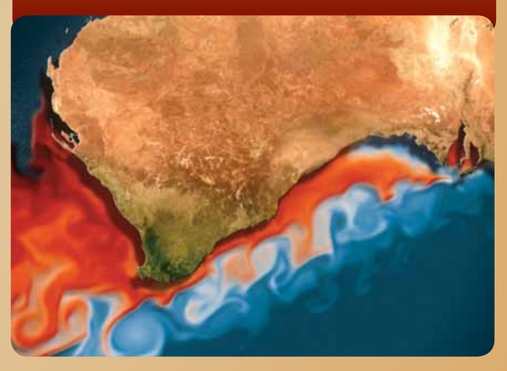
These clear, warmer, nutrient-poor waters support a high variety of marine species (biodiversity) but very low amounts (biomass) of finfish.

The current plays an important role in the spawning and distribution of coral as well as that of other tropical organisms, in the life cycle of western rock lobster and southern bluefin tuna, and in the distribution of seagrass and algae, sea birds, and coastal scallop and finfish stocks.

Just right

The Leeuwin Current transports warmer waters south but does not flow at the same strength during the year. Stronger in the colder half of the year (April to September), the warm water temperatures maintained by the current throughout winter enable tropical species to thrive much farther south of their normal range – and further south than elsewhere in the world.

As they are unlikely to breed in cooler temperate waters, the continued presence of these tropical species in the south-west of WA depends on the arrival of eggs, larvae or juveniles from Ningaloo Reef and the Abrolhos Islands, carried south by the Leeuwin Current.



Samson fish

Samson fish migrate from southern Australia during the summer to form spawning aggregations in the waters west of Rottnest Island. They finish spawning when the Leeuwin Current begins to strengthen – transporting eggs and larvae, and some exhausted adults, back to southern waters.


Photo: Russell Cocker


Photo: Tim Leary

Pilchards/sardines

Pilchards prefer to stay close to home, so a weaker Leeuwin Current ensures their eggs and larvae are not transported too far away from where they were spawned.

Western Australian salmon

During the summer and autumn, big schools of salmon migrate west along the southern coast of Australia to spawn in waters off the south-west corner of WA. The Leeuwin Current carries the larvae eastwards, where they settle in nursery areas along southern WA and the coast of South Australia.

A temperate response

By the time it reaches Cape Leeuwin, the Leeuwin Current has lost several degrees in heat. Only the toughest tropical eggs, larvae and juveniles have survived the journey this far – leaving the waters of the south coast mainly to temperate organisms.

Here, the influence of the Leeuwin Current is felt in other ways – the warmer waters are likely to act as a spawning trigger for temperate marine species, carrying their eggs and larvae south and east into coastal nursery areas.


Photo: Henrique Kwong

Australian herring

Australian herring also migrate from the southern coast of Australia to the south-west corner of WA to spawn. Depending on the strength of the current, eggs and larvae may be carried only as far as the southern Western Australia nursery areas or in stronger years much further east to South Australia and Victoria.

Mud crabs

An abnormally strong Leeuwin Current in 1999 and 2000 swept mud crab larvae 1,000 kilometres southwards into south-west estuaries. Normally only found north of Shark Bay, the crabs were able to grow into adults but the environmental conditions, particularly water temperature, did not let them reproduce.


Photo: Clay Bryce

Southern bluefin tuna

Between September and March, southern bluefin tuna migrate to their single known spawning ground in tropical Indian Ocean waters, between Java and northern Western Australia. As they grow, the young tuna ride the strengthening Leeuwin Current southwards down the WA coast to the Great Australian Bight and beyond.


Photo: OCEANA, Keith Ellenbogen

Wyndham
Derby
Rowley Shoals
Broome
80 Mile Beach
Dampier Archipelago
Port Hedland
Karratha
North West Cape
Exmouth
Ningaloo Reef
Carnarvon
Denham
Shark Bay
Abrolhos Islands
Geraldton
Jurien
Rottnest Island
Perth
Mandurah
Bunbury
Busselton
Margaret River
Albany
Cape Naturaliste
Cape Leeuwin
Esperance
Recherche Archipelago
LEEUWIN CURRENT

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