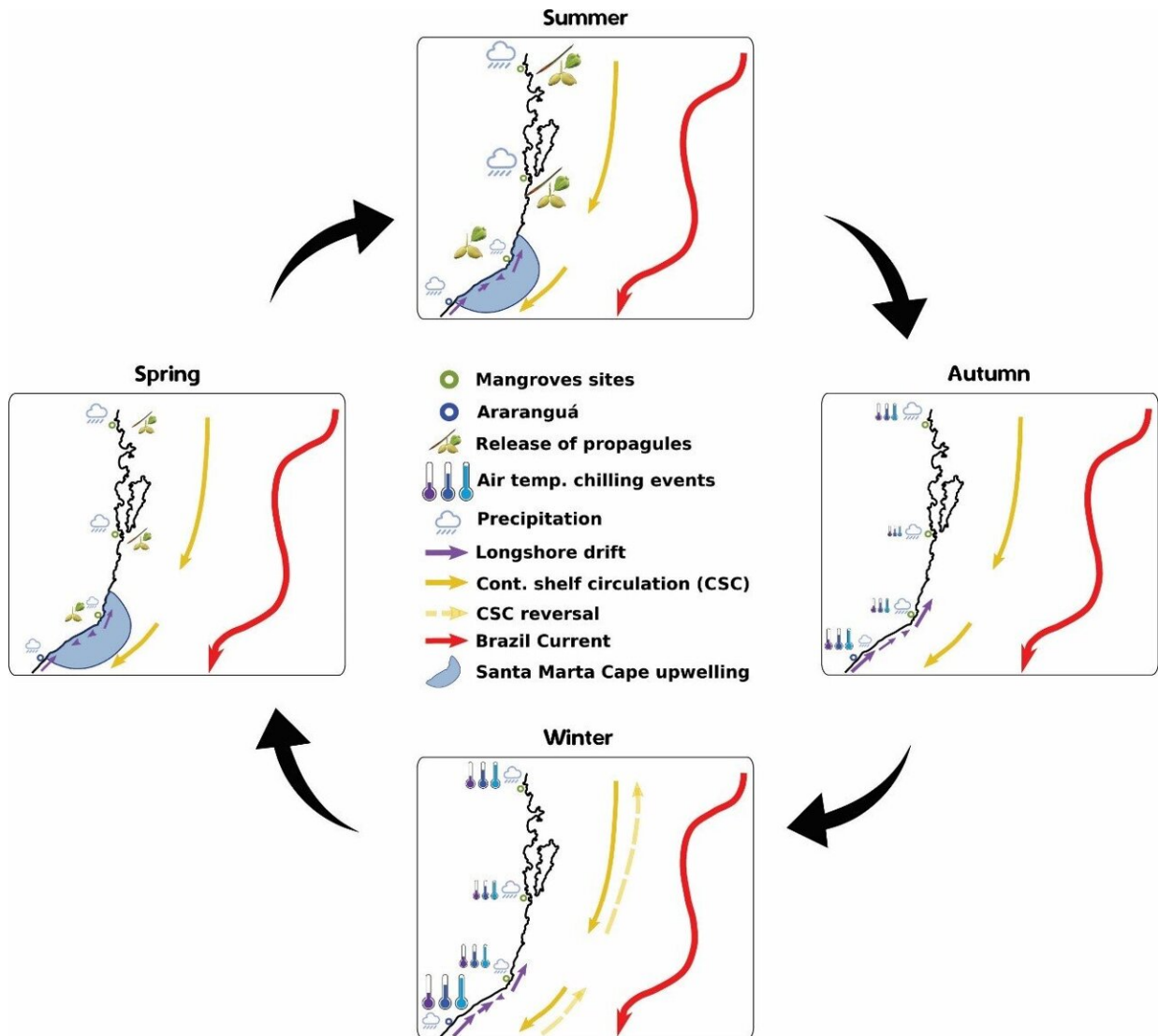


Researchers crack mangrove puzzle

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Mangrove spreading in 4 seasons. Credit: (c) Ari Ximenes

Mangrove ecosystems are distributed around the world, along tropical and subtropical coastlines. However, they do not extend beyond certain latitudes, even though the sites seem suitable for them. VUB researcher Ari Ximenes, with researchers from ULB and UCL, has now cracked this question among mangrove bio-geographers, by studying sites off the eastern coast of South America.

Ximenes says that their "results show that here, several factors combine to prevent the southward spread of mangrove species. The northward longshore drift that prevails throughout the year is the biggest factor. Another factor is the chilling temperature. The winters are often just a little too cold, and during spring and summer you often have cold water upwelling, which can affect the viability of the propagules."

Mangrove forests are of great ecological and socio-economic importance. They have an important place on the international climate agenda due to their pronounced carbon storage capacity. These tree and shrub species can also be found on the eastern South American coast. But barely 75km south of the southeastern American mangrove border there, where the Araranguá river flows into the Atlantic Ocean, there are no mangrove forests. This is puzzling, because the landscape form of the estuary actually appears suitable for mangroves.

For his doctorate, Ari Ximenes, of the VUB Laboratory for Plant Biology and Nature Management, Ecology and Biodiversity, analyzed important environmental variables, such as observation records of air temperature, precipitation and assessment of the adjacent ocean circulation, under the supervision of Professors Farid Dahdouh-Guebas (VUB and ULB) and Nico Koedam (VUB). This shows that seasonal atmospheric and oceanographic factors determine mangrove expansion on the eastern South American coast independently of other factors such as soil, and landscape form. This prevents mangrove forests from spreading further south in eastern South America.

Ximenes says that "studies of the range limits of mangrove forests are extremely important for monitoring the effects of climate change, as [mangrove](#) species could expand their range due to rising temperatures."

The study, of which Ximenes is lead author, was published in *Estuarine, Coastal and Shelf Science*. He conducted the research in collaboration with Leandro Ponsoni of the Université Catholique de Louvain, Catarina Lira of the Botanical Garden of Rio de Janeiro, Farid Dahdouh-Guebas (ULB-VUB) and Nico Koedam (VUB). The research was funded by CNPq from Brazil and FNRS from Belgium. Nowadays, Ximenes works as a scientist at the Center for International Forestry Research (CIFOR) where he continues to research [mangrove forests](#) and global wetlands.

More information: Arimatéa C. Ximenes et al, Seasonal atmospheric and oceanographic factors influencing poleward mangrove expansion in the southeastern American coast, *Estuarine, Coastal and Shelf Science* (2021). [DOI: 10.1016/j.ecss.2021.107607](https://doi.org/10.1016/j.ecss.2021.107607)

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