

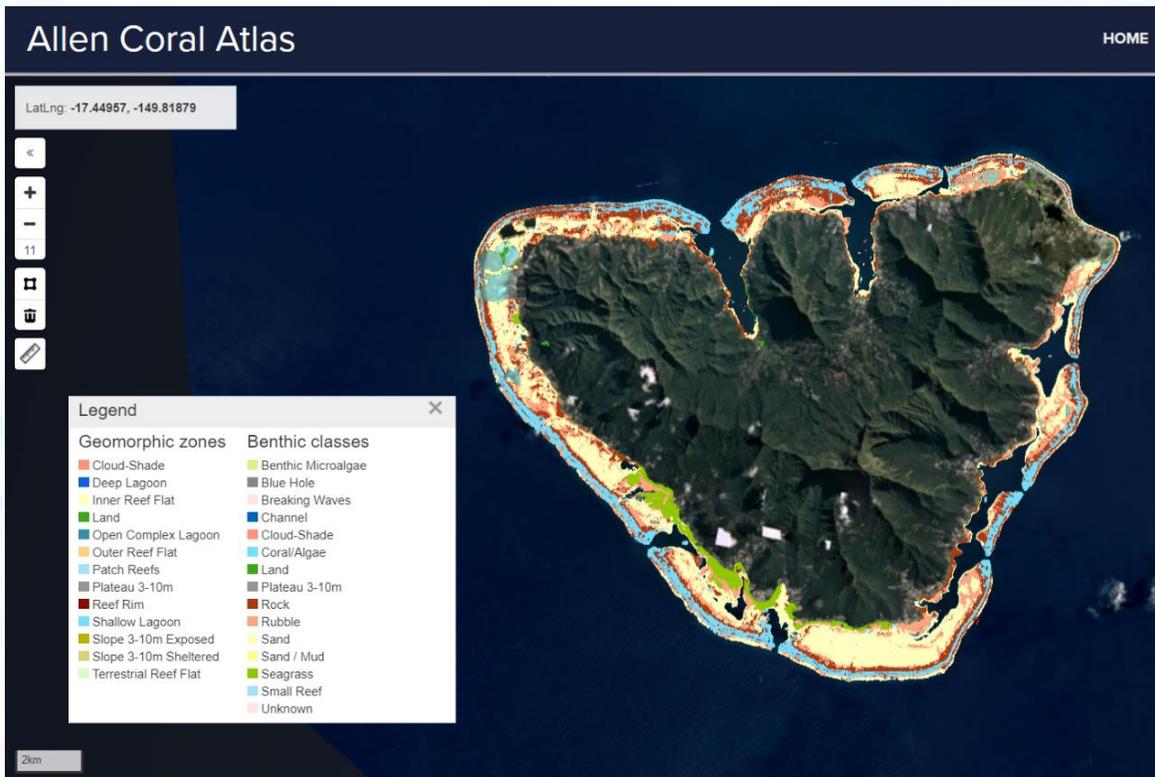


the weekly anthropocene



dispatches from the wild, weird world of humanity and its biosphere

By Sam Matey



New Maps: Allen Coral Atlas. Coral reefs are the most biodiverse sites in the ocean, covering a tiny percentage of their area but home to a quarter of marine species. In the Anthropocene, they are facing an array of threats, including ocean acidification, warming waters causing them to expel their photosynthetic symbiotes, plastic pollution spreading diseases, and overfishing and coastal development attacking their physical integrity. However, one international “dream team” of ecologists, biologists, and satellite imagery experts are trying to save the reefs by creating the first comprehensive atlas of the world’s reef. The Allen Reef Atlas (funded by Microsoft co-founder Paul Allen) uses data from 132 different satellites to map coral reefs at the extremely precise resolution of 12 feet per pixel. They have already mapped five test reefs (including French Polynesia’s Mo’orea, pictured above), and are rapidly ramping up their efforts, with a plan to map all coral reefs in the world by 2020. Once the mapping is complete, the reefs will be continually monitored for rapid changes that could be a sign of trouble brewing in the area. Also, the Atlas will help with the Gates Coral Lab’s efforts to find and propagate “super corals” that are naturally resilient to warmer oceans. This is spectacular news—the creation of a worldwide data set like this, with strong links to one of the strongest ongoing efforts to help coral survive warming seas, is the best news coral reefs have had in quite a while. For more, see goo.gl/aDzorS, allencoralatlas.org/, and gatescorallab.com/.



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New Wonders: Monterey Octopus Nursery. Scientists have discovered an immense “octopus nursery” on the seabed off the coast of Monterey, California, about 2 miles under the surface. The remote-controlled submersible *Nautilus* observed an estimated 1,000 octopuses (pictured, from the species *Muusoctopus robustus*) curled around their eggs and young in “inside-out” brooding postures. Interestingly, the water appeared to “shimmer” around where the octopuses were brooding, which different scientists ascribe to seeps of either warm water or natural gas. In a fascinating twist, this discovery comes only a few months after the first (and only other known) deep-sea octopus nursery was discovered off of Costa Rica. This means that such wondrous agglomeration of octopus mothers may be much more common than we think, and underscores just how little we truly know about our planet’s oceans. For more on this amazing discovery (and a video!) see goo.gl/YTV76W.

New Power Sources: HPEV Cells. Researchers at the U.S. Department of Energy have created a prototype “artificial photosynthesis device” that turns sunlight into two different forms of energy: electricity (like a conventional solar panel does) and hydrogen fuel. Their hybrid photoelectrochemical and voltaic (HPEV) cell is made of silicon and bismuth vanadate and is three times more efficient than previous attempts to build solar hydrogen generators. The researchers plan to continue developing the concept. Great news! For more, see goo.gl/6am2mb.



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New Protections: Nuru. The fall armyworm (*Spodoptera frugiperda*) reached West Africa in 2016. A deadly crop pest, the armyworm's caterpillars eat corn, sorghum, millet, and rice, and have already caused billions of dollars in damages. For the last few months, the UN Food and Agriculture Organization (FAO) is trying to gather data on the armyworm's spread with its armyworm monitoring app, FAMEWS. Now, it's added Nuru, an offline-capable add-on that uses machine learning to help individual farmers scan their crops for army worm damage. Nuru can count holes in a leaf in 600 milliseconds, gets better at identifying armyworm damage the more it is used, and when online, uploads all of its data to the FAO, who use it to map the spread of the armyworm. It also has an immediate benefit for farmers: when it detects armyworm damage, it gives information about what measures can be taken-and when it's online, it connects farmers to share information about the best remedies. This is a great example of how modern internet technologies can be leveraged to improve people's lives. For more, see goo.gl/393hVt.



New Action: EU Plastic Ban. In what is arguably the most important action on plastic pollution yet, the European Parliament has voted in a comprehensive ban on single-use plastics, as well as limitations on other types of plastics. The new legislation, which passed with 571 in favor to 53 against, decrees that single-use plastic products (including plastic cutlery, cups, plates, and cotton buds) will be banned in the EU from 2021. (The European Commission notes that single-use plastics make up 70% of all marine litter). Furthermore, the plastics "for which no alternatives exist" (such as food wrappings) are now required to have a 25% reduction in use by 2025. Plastic beverage bottles are required to be 90% collected and recycled by 2025, and cigarette butt use will be cut 80% by 2030. "We have adopted the most ambitious legislation against single-use plastics," said Member of the European Parliament Frédérique Ries (of southern Belgium, pictured), who proposed the bill. This is spectacular news, a huge step forward, and an example to the world of how to reduce plastic pollution! For more, see goo.gl/Rp9ZBw.

