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PLUS 101 MORE IDEAS THAT WILL CHANGE THE WORLD



OYSTERS FIGHT CLIMATE CHANGE

An unexpected miniature hero will help save the planet in 2015

By **Jonathan Grabowski**

O

YSTERS WILL BECOME HEROES in 2015, as oyster reefs become front-line troops in the battle to reduce the effect of human activity on the natural world. Oyster reefs are examples of important coastal ecosystems – the group also includes coral reefs, mangroves, salt marshes and sea grasses – that provide disproportionately high levels of ecosystem services. They support a wide diversity of species,

enhance water quality, cycle nutrients, sequester carbon and stabilise our shorelines by reducing erosion.

Many of these critical estuarine habitats are highly imperilled by human activity. According to a report by US environmental organisation The Nature Conservancy, oyster reef habitats have already been reduced by 85 per cent globally and are particularly vulnerable because they are destructively harvested by oyster fisheries.

Now, led by the US, oyster reefs are starting to be rebuilt – and in 2015 they will become more biodiverse. Governmental and non-governmental agencies will be boosting oyster-reef restoration projects in 15 states, along the west coast of the US, in the Gulf of Mexico and across the eastern seaboard.

Restoration efforts will be aimed at ecosystems rather than small patches of habitat. The projects will involve ecologists, economists and social scientists working together to develop a quantitative framework that balances the return on investment from restoration and conservation efforts with associated costs. The focus will be on reefs that can provide the greatest socio-economic and environmental benefits. This will reduce environmental injustices. Disadvantaged people often live nearest to regions where habitat degradation and loss is highest, and coastal communities are particularly vulnerable to natural disasters such as

hurricanes and flooding. In 2015, restoration efforts will be targeted towards the most endangered and impoverished coastal communities.

As humans modify the environment, a key question is which species will thrive and which will be pushed towards extinction. This question is particularly important for species such as oysters because they engineer habitats that are used by a vast array of other resident and transient fauna. Reefs provide refuge for other molluscs, crustaceans and juvenile fishes. Oysters are especially vulnerable to climate change as oceans become more acidic, and declines in oyster reefs affect these other species too. Early research suggested that oysters and bivalves in general are among those species most negatively impacted by ocean acidification. Yet my colleague Justin Ries and his team are beginning to disentangle the more subtle effects of acidification on these aquatic communities, such as how it influences predator behaviour and consumption of prey, and the results are more promising.

At the University of North Carolina, Tony Rodriguez and his colleagues have recently found that intertidal oyster reefs in North Carolina can grow far faster than previously thought, and are highly capable of keeping up with sea-level rises. Further collaboration among ecologists, ecosystem scientists and geoscientists will continue to advance our understanding of how oyster reefs and the communities they support can adapt to acidification and other environmental stresses. These will enhance reef-restoration efforts and help recover ecosystem services. *Jonathan Grabowski is associate professor, Marine Science Center, Northeastern University in Boston*

RECHARGE

Power lines will be perches, if researchers at MIT can commercialise its bird-like drones that can draw energy from the lines' electromagnetic radiation when they sit on the cables.