# **SEAHIVE: A Shoreline Protection System That Supports Environmental Restoration**





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#### Wave-energy dissipation

Perforations on the side faces of SEAHIVE units form interconnected channels allowing water and dissipating wave energy through turbulence. Laboratory tests at the UM SUrge STructure Atmosphere INteraction (SUSTAIN) Facility showed that the system provides better protection against wave action and thus storm surge than vertical seawalls and trapezoidal submerged breakwaters.



#### **Durable and cost-effective**

The SEAHIVE system design optimizes material use, while its material minimizes environmental impacts and extends service life. The mixtures explored are expected to be sustainable (50% less CO<sub>2</sub> than conventional cement) and durable. Manufacturing is done using conventional concrete casting techniques or extrusion.







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# **Habitat creation**

The structural complexity of the SEAHIVE system combined with the use of ecofriendly materials increases the system's potential for habitat creation. SEAHIVE elements are manufactured using reinforced concrete using non-corrosive reinforcement and Portland Limestone Cement (PLC) with high replacements of supplementary cementitious materials (SCMs).



# **Modular and adaptive**

The design of the SEAHIVE units and system can be adapted to the site conditions and is applicable onshore and offshore. The system can be tuned to generate a desired dissipation capacity and slope. SEAHIVE units can be stacked horizontally or vertically with voids varying in diameter or filled with granular material for energy locations or left open for maximum dissipation.







