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COMMITTEE MEMORANDUM

TO: Sustainability and Resiliency Committee

FROM: Jimmy L. Morales, City Manager

DATE: October 23, 2019

SUBJECT: **DISCUSSION ON ARTIFICIAL REEFS**

BACKGROUND

At the City Commission meeting on May 16, 2018, the Mayor and City Commission referred a discussion to the Sustainability and Resiliency Committee (SRC) on artificial reefs. The item was sponsored by Commissioner Ricky Arriola. At the SRC meeting on November 28, 2018, the University of Miami's Laboratory for Integrative Knowledge (ULINK) Coastal Resilience Team presented a partnership project with the City of Miami Beach to develop and test coastal resilience strategies that combine grey and green infrastructures to reduce the vulnerability of coastal communities.

The project was divided into two phases:

- Phase 1: Develop and test restoration strategies that combine gray (cement-based) and green (nature-based) defenses to protect our coast. Status: Completed (Attachment A – progress report).
- Phase 2: Complete a vulnerability and physical modeling to move the project into implementation and deployment. Status: in progress.

The researchers will use the knowledge gained to design plans for an artificial reef deployment in Miami Beach and implement a communications strategy to inform stakeholders on the benefits of nature-based coastal protection strategies for coastal resilience (Attachment B). The second phase of the project will be fundamental to apply lessons learned for the large-scale funding needed to deploy an artificial reef to enhance coastal resilience at meaningful scales.

ANALYSIS

City staff has been working with the ULINK Coastal Resilience team in order to implement the second phase of this project. City staff, ULINK Coastal Resilience, Miami-Dade County's Regulatory and Economic Resources (RER) and the U.S. Army Corps of Engineers (USACE) teams have discussed the development and implementation of a pilot project that looks at artificial reefs and natural reefs restoration in Miami Beach to reduce storm surge risk. The pilot will test the performance of coral fragments mounted onto modules under natural conditions and then, coral survivorship and growth will be monitored at pilot sites (Attachment C).

The ULINK Coastal Resilience team used their one-of-a-kind wave tank at the SUSTAIN lab to test different man-made reef designs (including different berm heights and shapes, as well as different coral species, sizes) under simulated storm wind and wave conditions in order to determine the best structures to be placed during the pilot. Along with the model being tested at the SUSTAIN lab, the ULINK team will be able to compare the results under the modelling and under natural conditions. The pilot will provide first-ever actual measurements of reductions in wave energy as a result of deployment both with and without restored coral.

The goal is to have a pilot installed offshore within the next 12 months. The Environment and Sustainability Department has been working with the ULINK team and the environmental agencies on permitting and site selection. The construction is currently unfunded and ULINK is seeking funding.

CONCLUSION

The following is presented to the members of the Sustainability and Resiliency Committee for discussion. Staff recommends the SRC accept the pilot in concept so staff can finalize the site location and proceed with proving permitting assistance and project installation.

ATTACHMENTS

A- Progress report
B- ULINK fact sheet
C- Field Deployment of Coral-Breakwater Hybrid Reef

SMT/ESW/FCT