

# Alternative Foundations and Installation Methods

## Offshore Wind Noise Reduction Workshop

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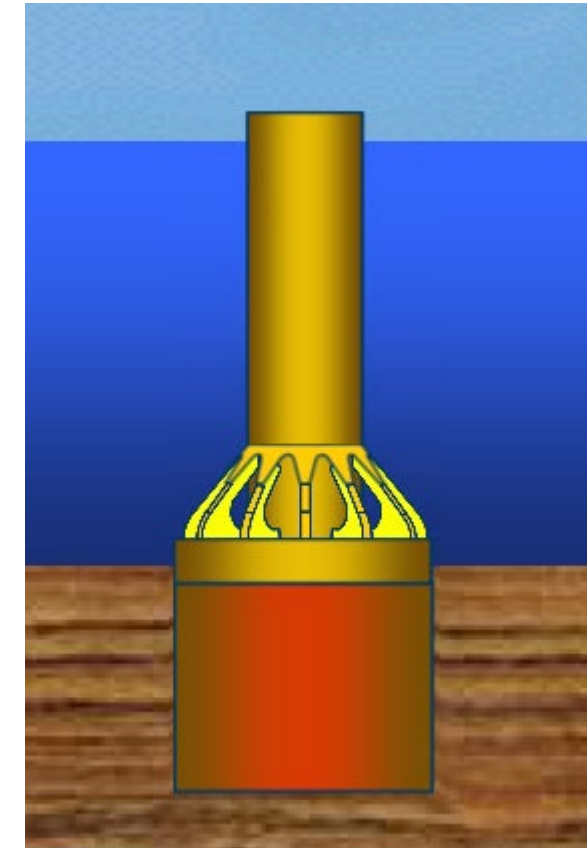
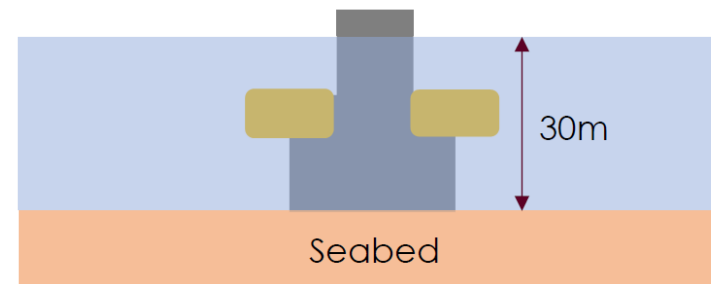
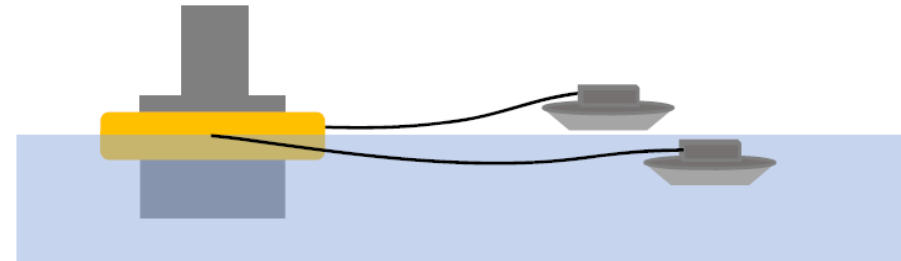
# Summary of R&D for monopile alternatives

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- NOWRDC and WETO portfolios
  - <https://nationaloffshorewind.org/project-database/>
- Suction bucket foundations
- Vibratory installation
- Gravity based structures

## Vibratory-Installed Bucket Foundation for Fixed Foundation Offshore Wind Towers

- NOWRDC funded project
- Monobucket caisson
- Vibratory installation
- Suction bucket
- Wet-tow
- Barge transport
- Avoids impact hammering noise





## Tri-Suction Pile Caisson TSPC Foundation Concept

- NOWRDC funded project
- Central column alternative to jacket
- Simple fabrication
- Avoids monopile hammering noise

# RCAM Technologies

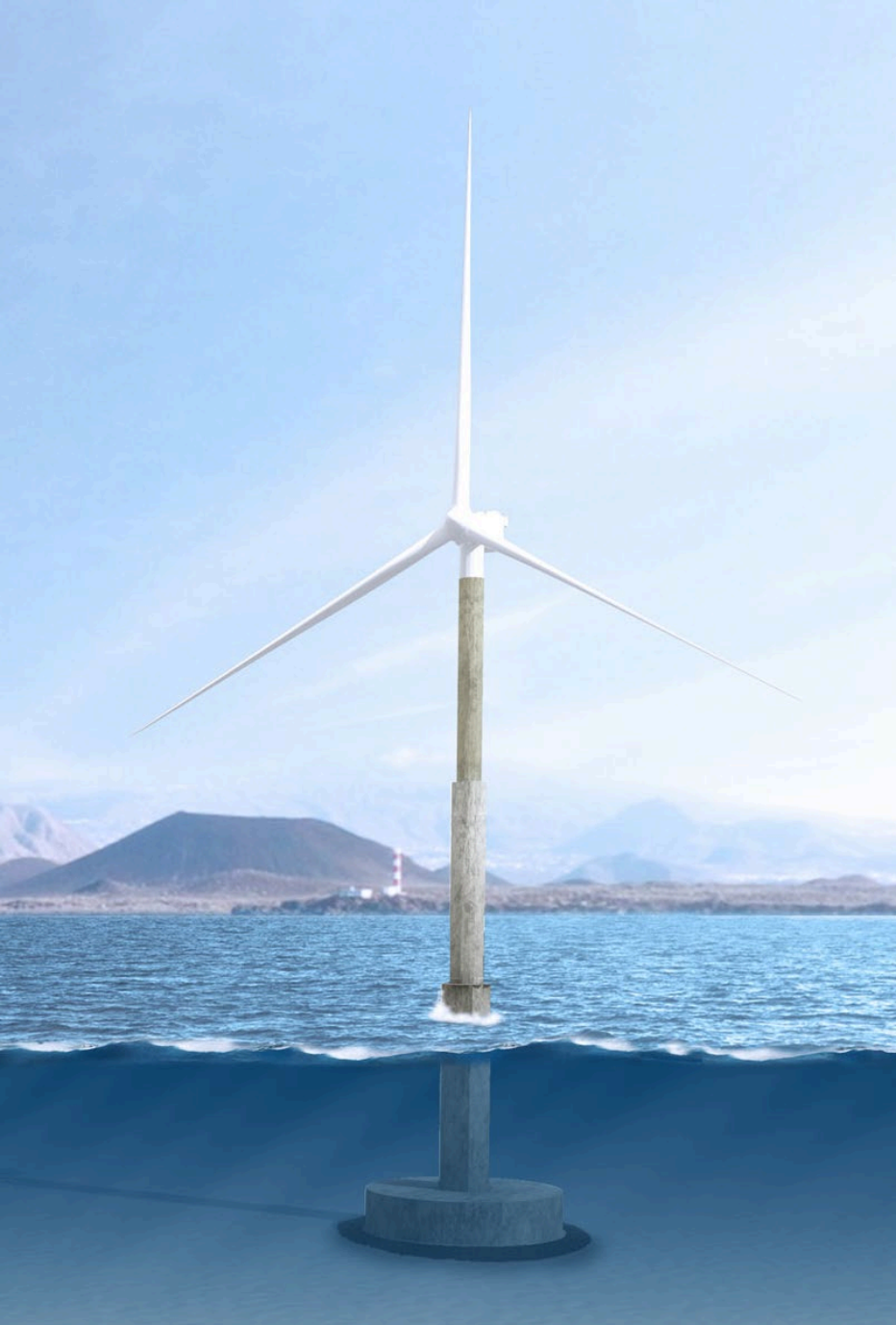
## A Low-Cost Modular Concrete Support Structure and Heavy Lift Vessel Alternative

- NOWRDC funded project
- Concrete tripod
- Pre-cast concrete, 3D concrete printing
- Suction pile, driven pile, or GBS
- Avoids monopile hammering noise



## Self-Installing Concrete Gravity-Base Substructure Sizing for 15MW Turbine

- NOWRDC funded project
- Gravity-based foundation
- Fully assembled quayside
- Wet-towed with a TIM
- Avoids monopile hammering noise



# Tufts

## Effect of Fatigue on the Capacity and Performance of Structural Concrete

- WETO funded project
- Use of concrete for offshore wind support structures
- Concrete designs avoid monopile hammering noise
- Long lifespan, durability, local content, nature inclusive design
- <https://www.energy.gov/eere/wind/articles/researchers-study-concrete-alternative-steel-wind-turbine-foundations-and-towers>

