LIVING BREAKWATERS & TOTTENVILLE DUNE

CAC MEETING #03

Our Lady Help of Christians

2/10/16

NYC Parks

NY RISING

SCAPE TEAM

SCAPE / LANDSCAPE ARCHITECTURE
OCEAN AND COASTAL CONSULTANTS
PARSONS BRINCKERHOFF
ARCADIS
SEARC ECOLOGICAL MARINE CONSULTING
NEW YORK HARBOR FOUNDATION
LOT-EK ARCHITECTURE
MFS CONSULTING ENGINEERS
PRUDENT ENGINEERING

AGENDA

#01 INTRODUCTION & PROJECT OVERVIEW

#02 RECAP FROM NOVEMBER'S CAC MEETING

#03 DESIGN PROGRESS UPDATE

#04 Q&A

#05 BREAKOUT TABLES & INFO SESSION

#06 RECAP

WELCOME & INTRODUCTION

INTRODUCTIONS
COMMUNITY ADVISORY COMMITTEE

- James Pistilli (Co-Chair)
- Victoria Cerullo (Co-Chair)
- Debra Amoroso
- Phyllis Broughton
- Edward Canlon
- Catherine Cramer
- Kerry Halvorsen
- Albert Klingele
- Michael Kress
- Gloria Maldonado
- John Malizia
- Nicole Nigro
- Pamela Pettyjohn
- Anthony Reinhart
- Frank Santarpia
- Bill Shadel
- Diane Silverman
- Veronica Petersen
- Michele Moore
- Lauren Cosgrove

INTRODUCTIONS
PROJECT TEAMS

Government Partners

NY RISING

NYC Parks

DASNY

Environmental Review Team

AKRF

Hill International

Breakwaters Design Team

SCAPE / LANDSCAPE ARCHITECTURE PLLC

COWI

ARCADIS

LOT-EK

PARSONS BRINCKERHOFF

SeARC

PRUDENT ENGINEERING

MES

BILLION OYSTER PROJECT

New York HARBOR FOUNDATION

Peer Review

TETRA TECH

Dune Design Team

Stantec

RAGE

Naik GROUP

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Since we met last …

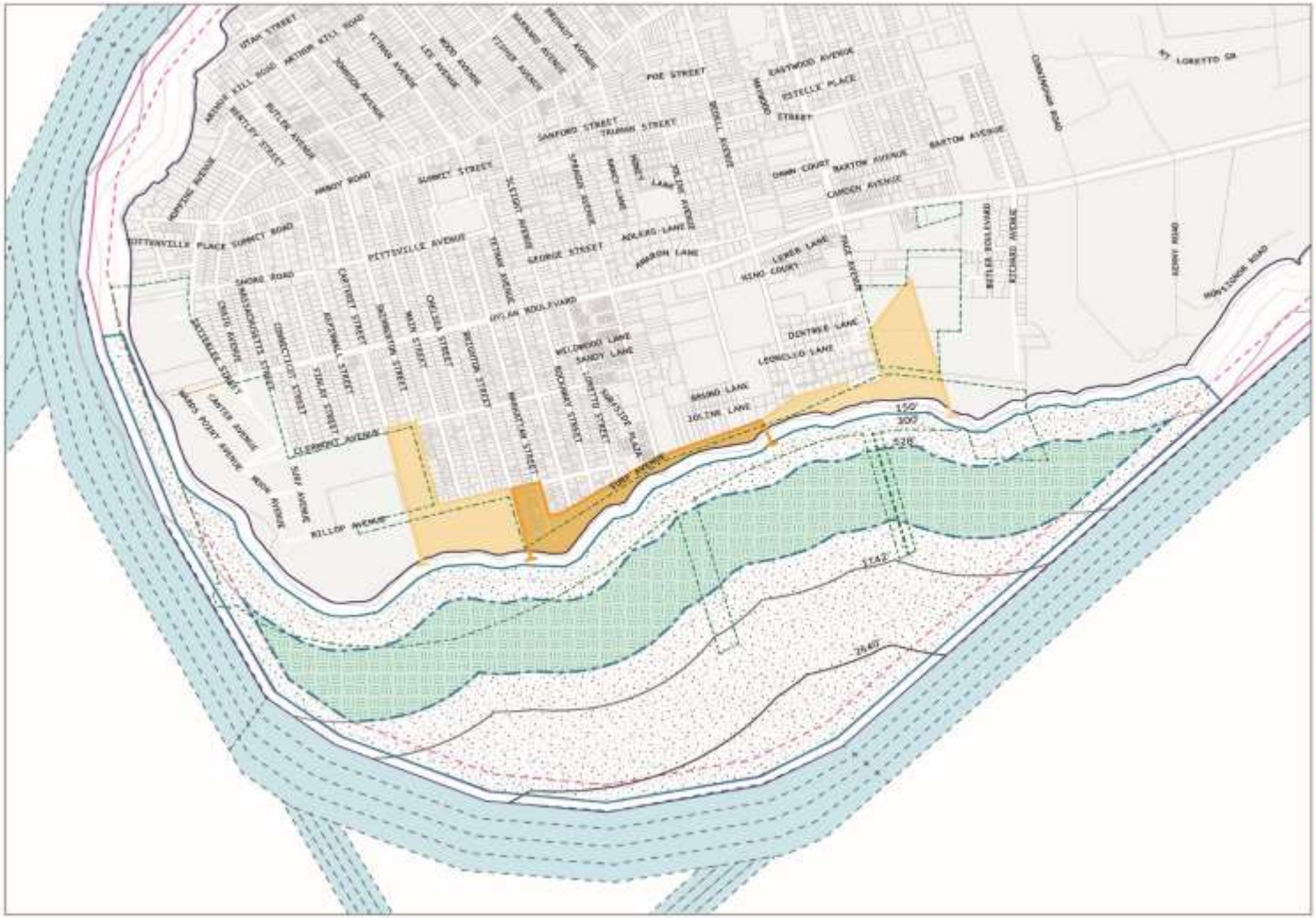
- ADCP units have been placed in the water off of Tottenville
- Dune survey close to completion
- Wave data transformed to the project site for modeling purposes
- Baseline modeling has begun
- Design team has begun to determine what the first breakwater scenarios to be modeled should be

Parks Update

- A post-storm survey of all of the berms (visual & topographic) will be performed
- Damaged trap bags will be repaired or replaced
- Work is schedule to begin within 30 days

Living Breakwaters and Tottenville Dune Site Map

Tottenville, Staten Island



RECAP FROM NOVEMBER'S CAC MEETING

Water Hub community input:

- Help inform the potential **programs** that are desired at the Water Hub
- Identify **potential sites** for the Water Hub to be located
- Give input to the design team on design considerations for the Water Hub (next phase of work)

WATER HUB PROGRAM CHARRETTE

THANK YOU!

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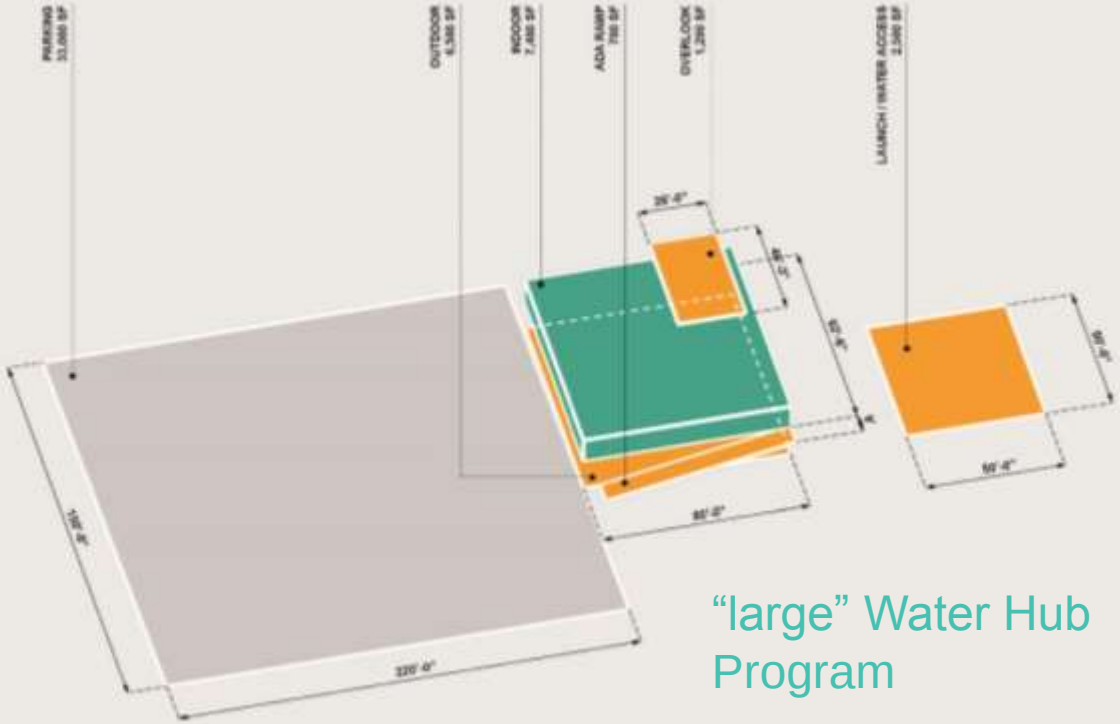
"small" Water Hub Program

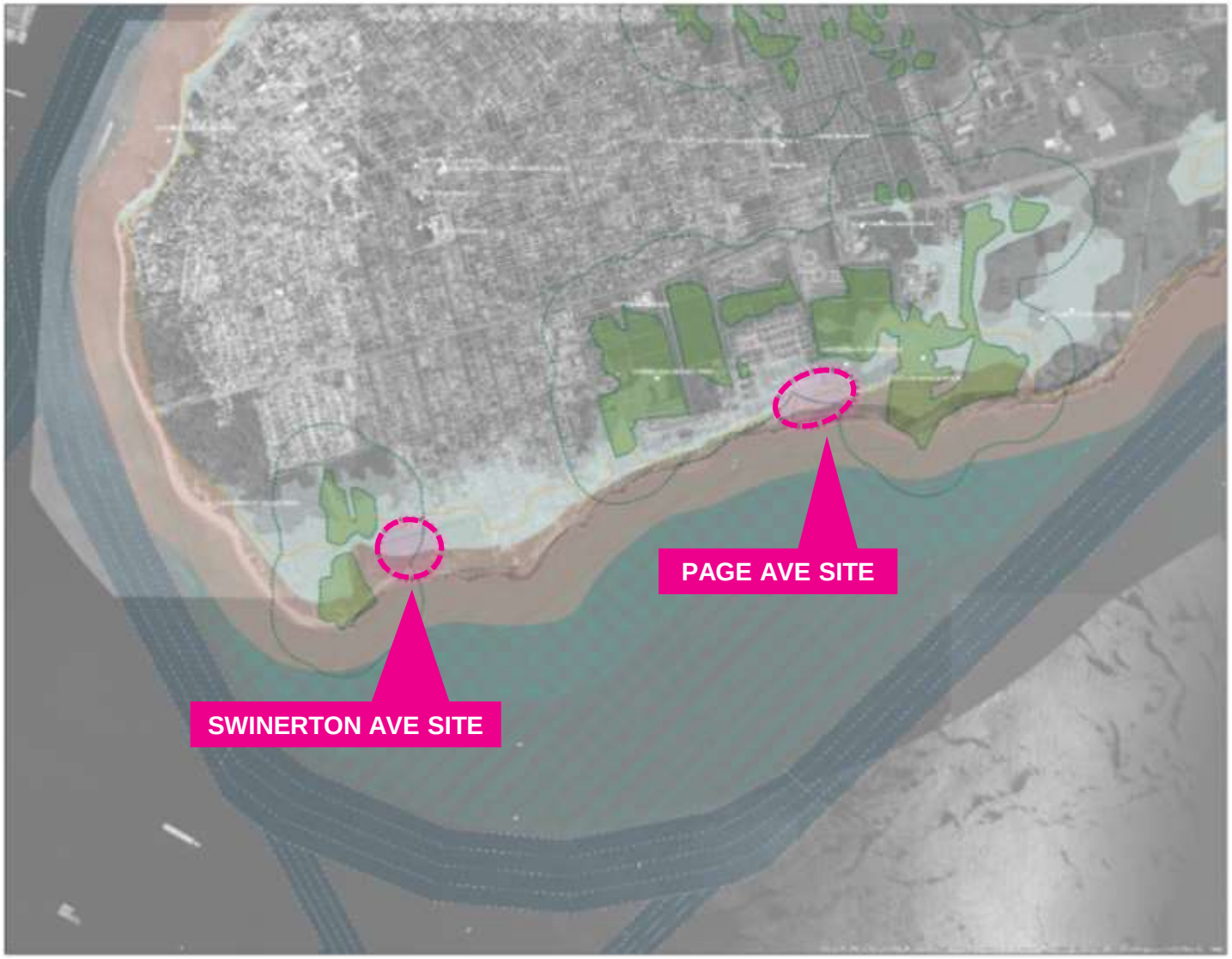


"large" Water Hub Program

WHAT WE HEARD…

Desired Program:

- **Multipurpose spaces**
- **Flexible indoor / outdoor spaces**
- **Engagement with the shoreline**
- **Educational spaces for learning**



WHAT WE HEARD…

Desired Location:

- Create a link between Conference House Park and Mt. Loretto
- In a public area

WHAT WE HEARD…

Desired Location:

- **Create a link between Conference House Park and Mt. Loretto**
- **In a public area**

More info & discussion at the Water Hub table!

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DESIGN PROGRESS UPDATE

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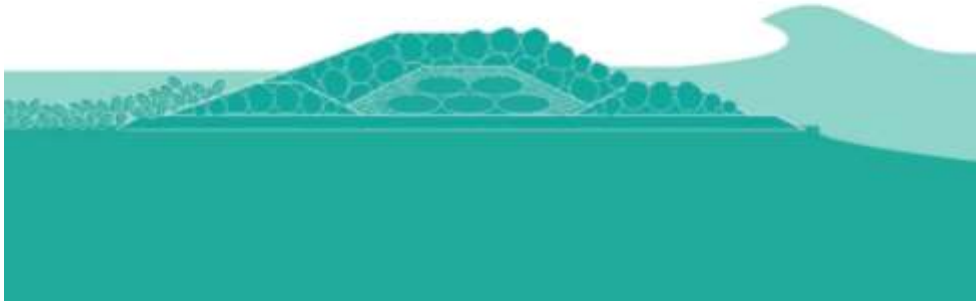
IT IS NOT JUST ABOUT TWO PROJECTS …

+



DUNE (proposed)

LIVING BREAKWATER (proposed)

Image: SCAPE Team, Rebuild by Design

IT IS PART OF A LAYERED APPROACH!

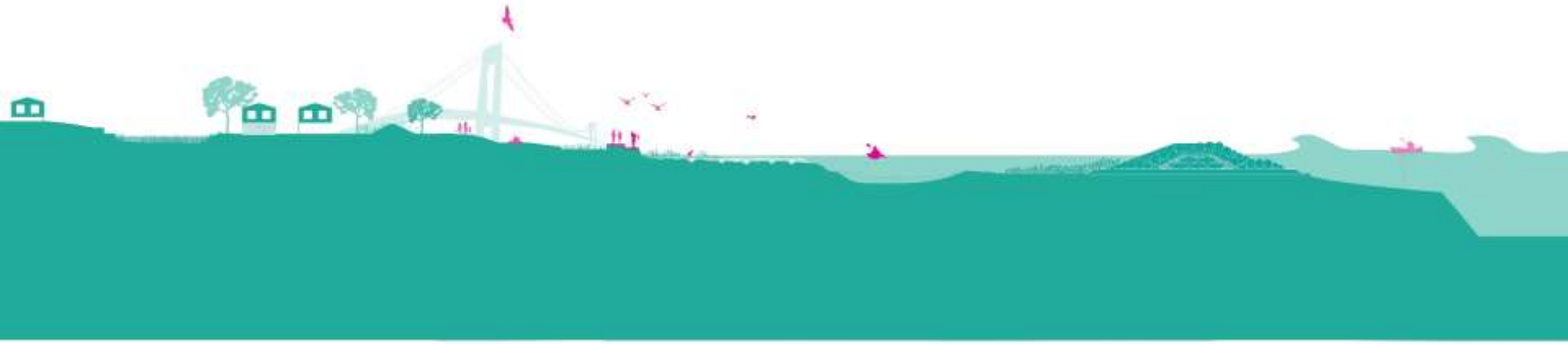


Image: SCAPE Team, Rebuild by Design

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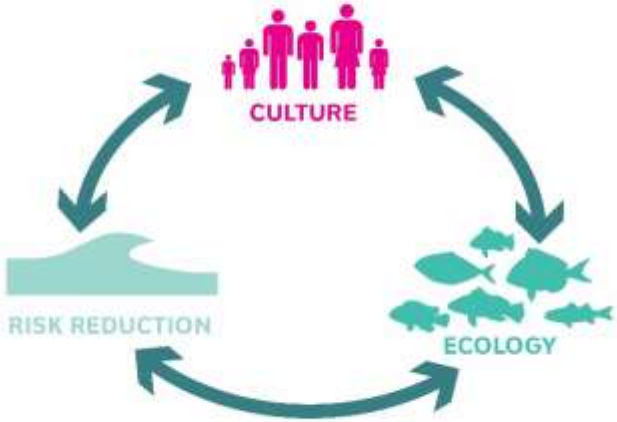

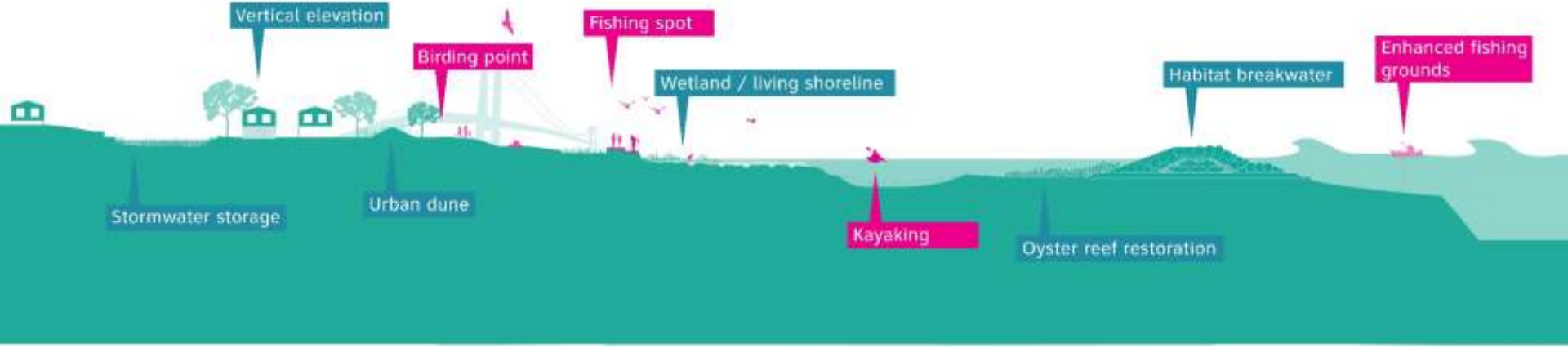

Image: SCAPE Team, Rebuild by Design

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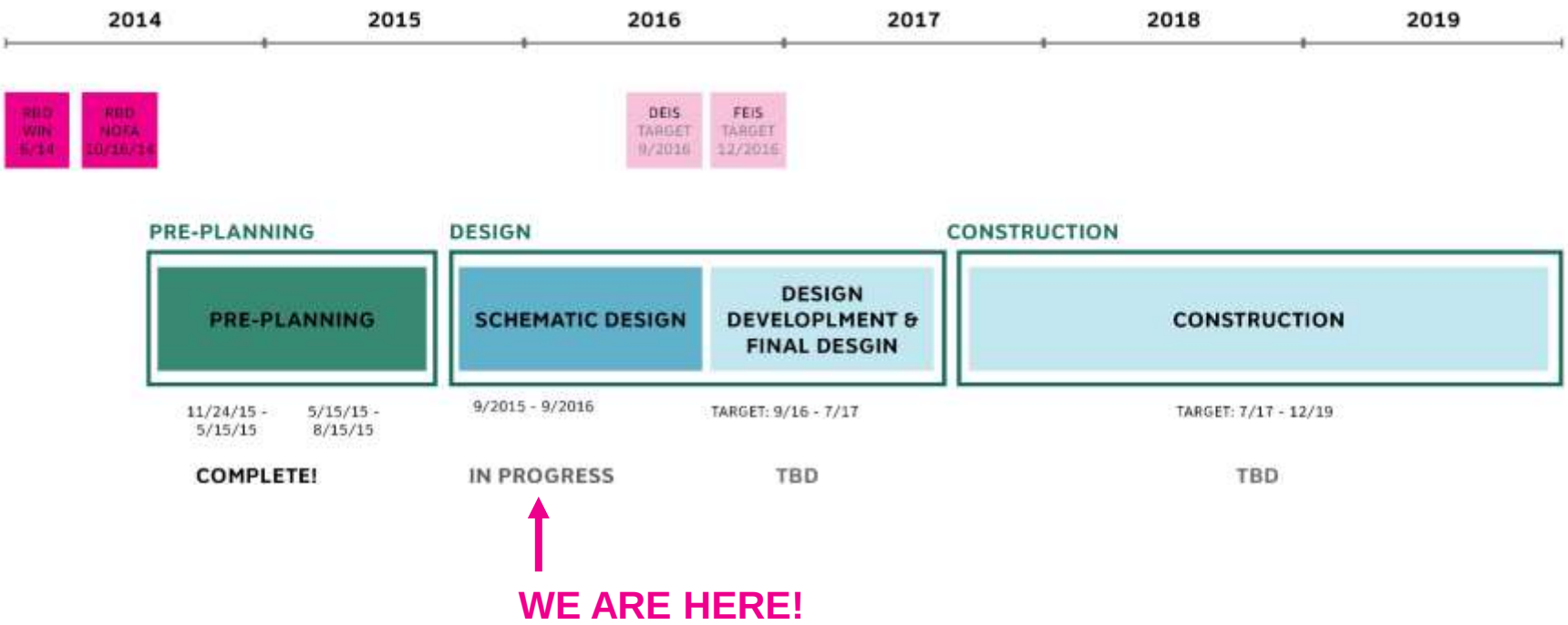
Design Progress Update

- Schedule
- Existing conditions surveys, modeling & analysis completed
- Design considerations
- Modeling Approach



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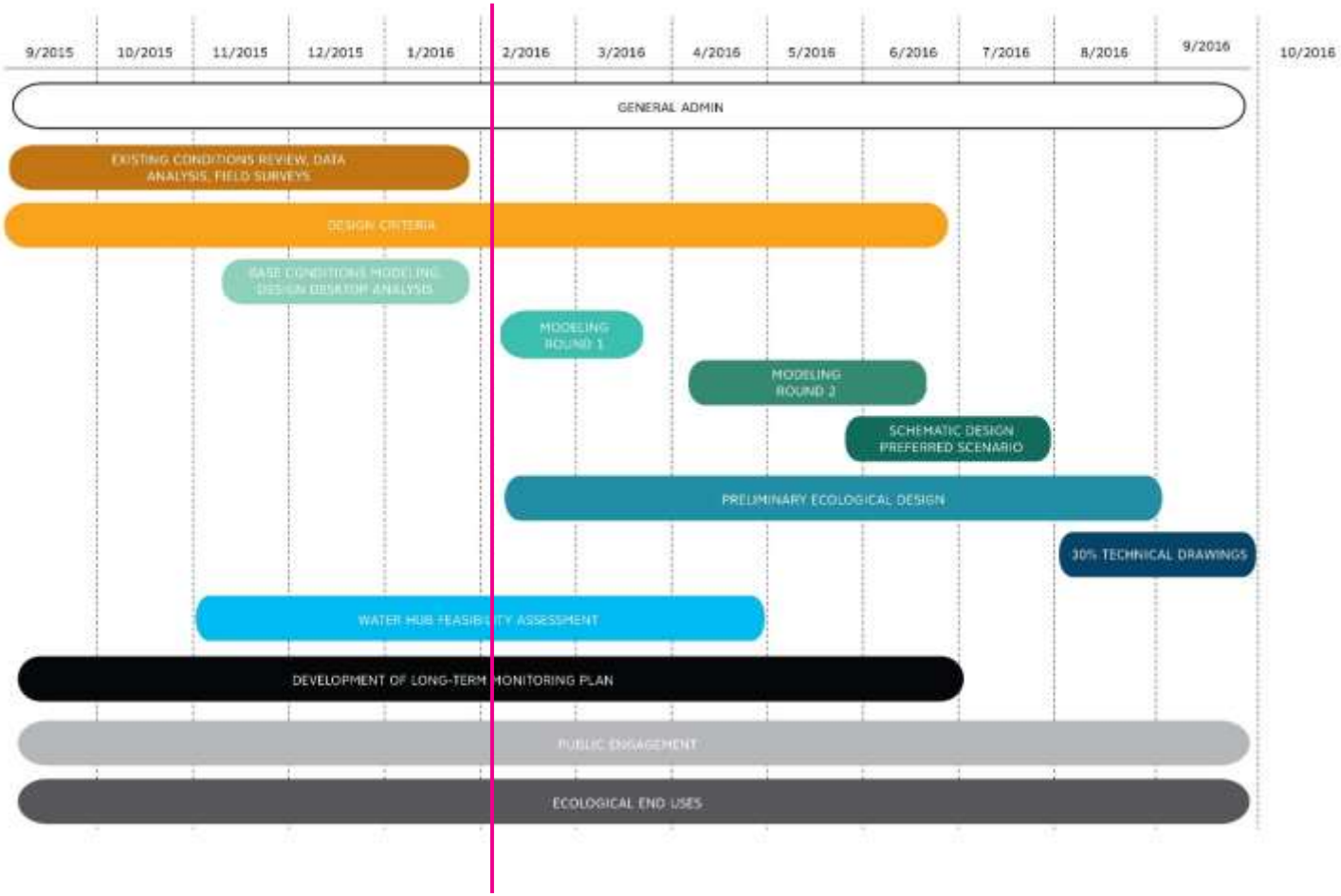
LIVING BREAKWATERS SCHEDULE

WE ARE HERE!



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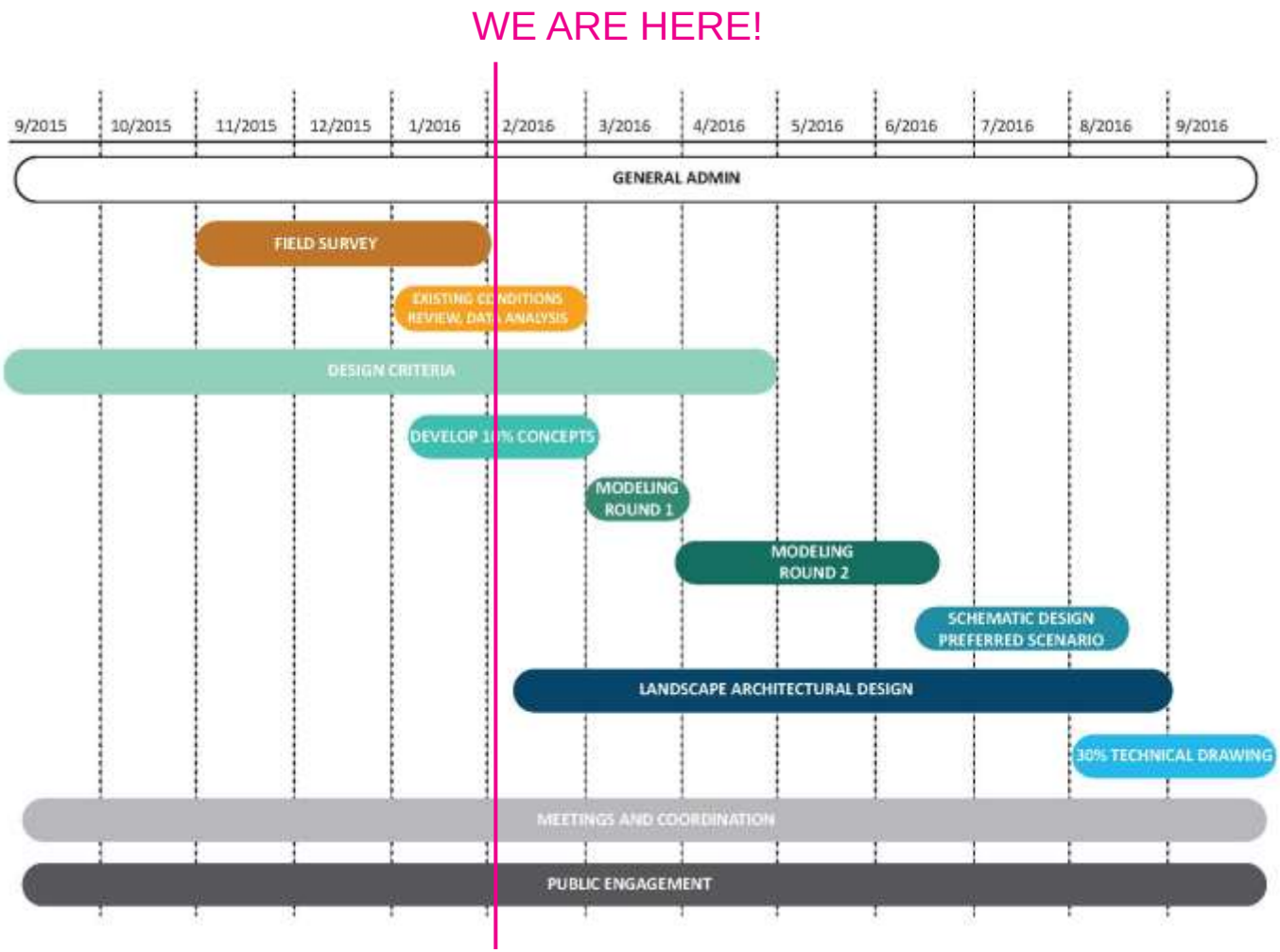
TOTTENVILLE DUNE SCHEDULE



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SURVEYS COMPLETED

- Geotechnical Borings
- Shoreline Structures Survey
- Beach Profile Transects
- Benthic / Fish Survey
- Adjacent Artificial Habitat Survey
- Landside Topographic Survey

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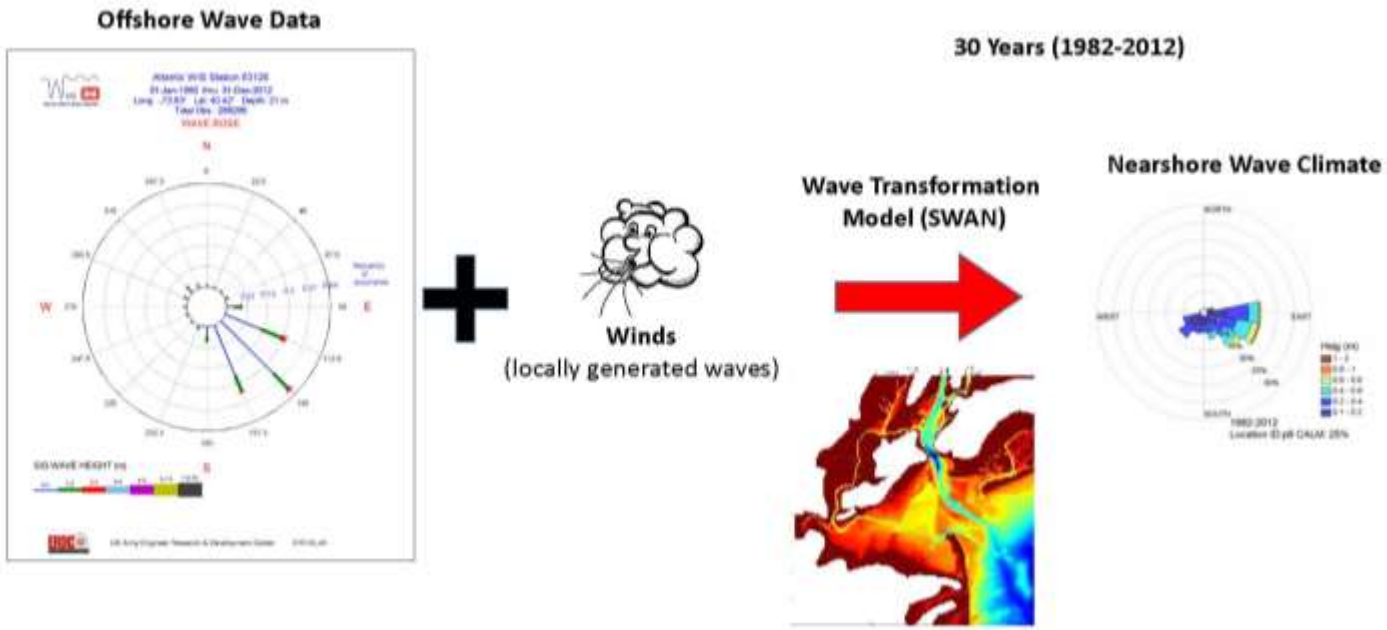
UNDERSTANDING THE LOCAL "WAVE CLIMATE"

- **Local Wave data is needed to inform design and modeling**
- **No long-term observed wave data for this site was available**
- **Offshore WIS (Wave Information Study) station has hourly data**

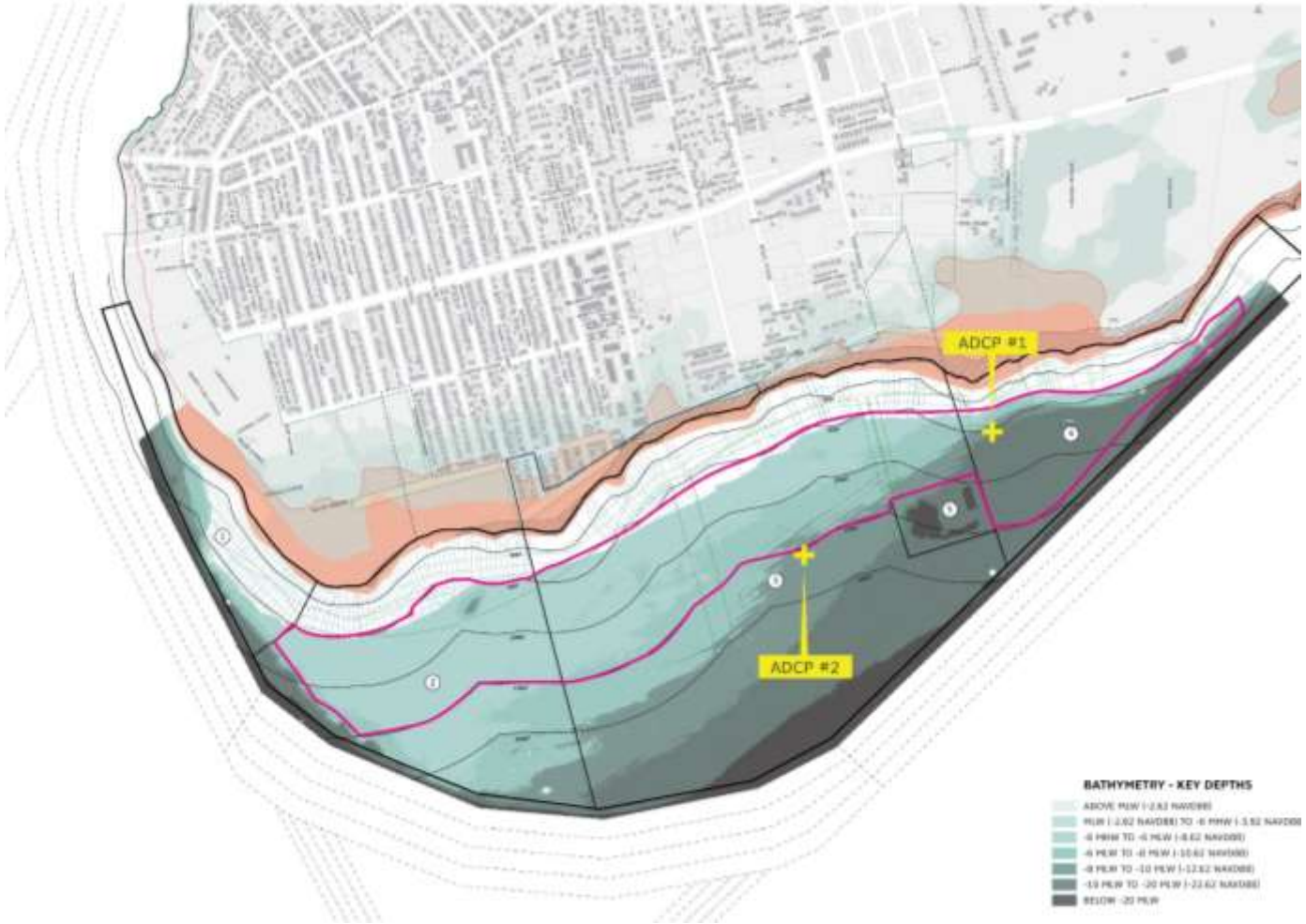
WAVE TRANSFORMATION MODELING



- **Offshore wave data was combined with wind information and local bathymetry**
- **Now have 30 years of hourly wave data for the site!**

More info at the Breakwater Design table!

ADCP PLACEMENT



- Acoustic Doppler Current Profiler
- 2 placed offshore of Tottenville
- Collect daily wave and current information
- 10 minute and hourly intervals

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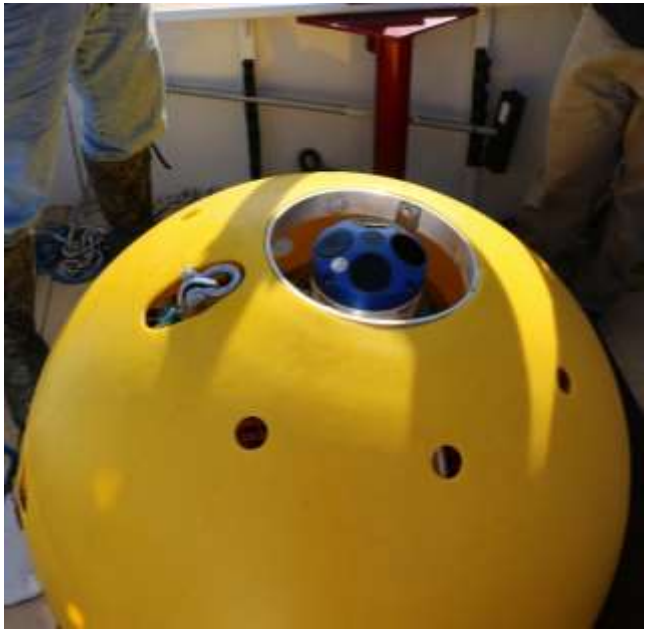

ADCP PLACEMENT

More info at the Ecological Design table!

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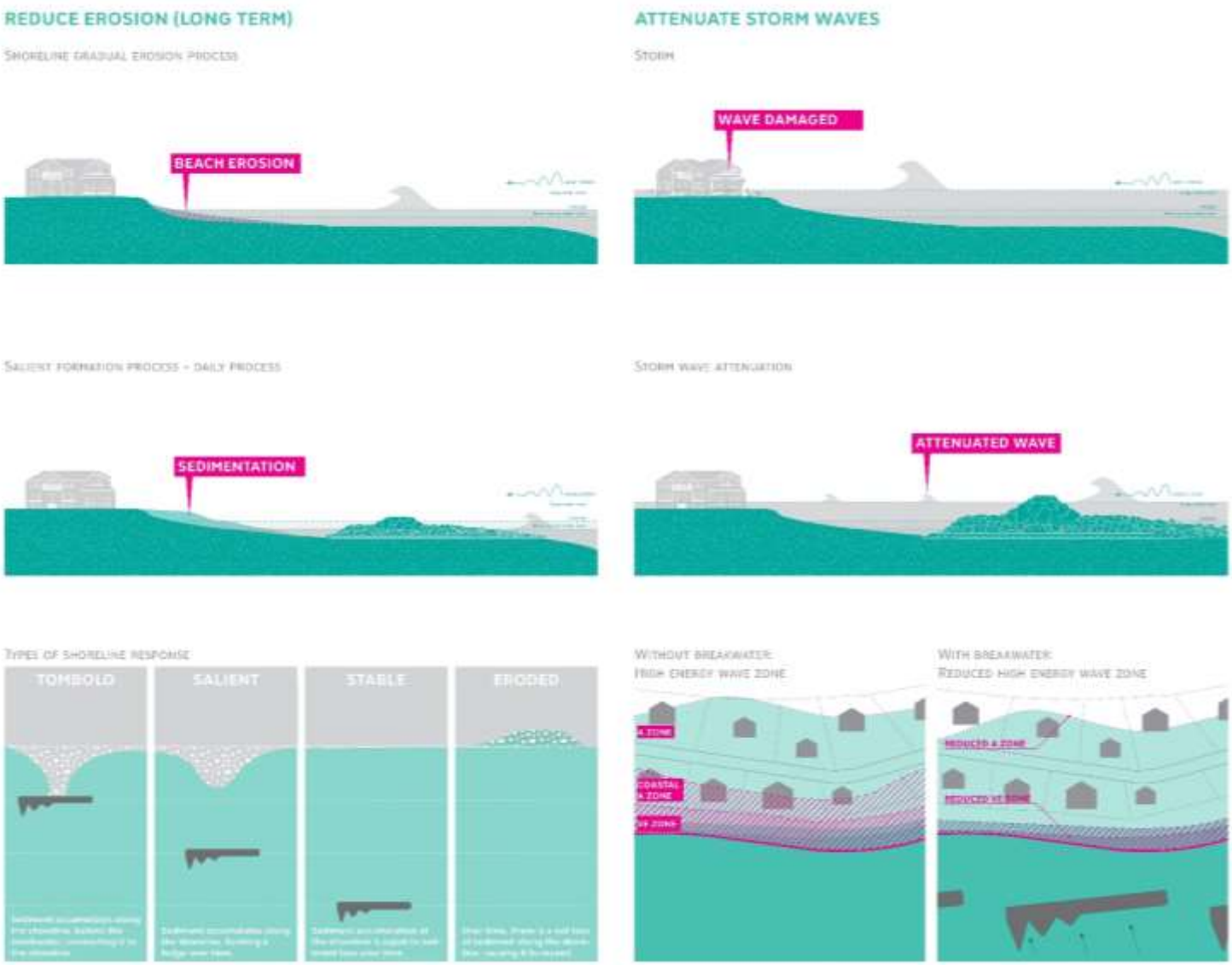
ADCP PLACEMENT

More info at the Ecological Design table!

DEVELOPING DESIGNS

How do breakwaters work to reduce risk?



More info at the Breakwater Design table

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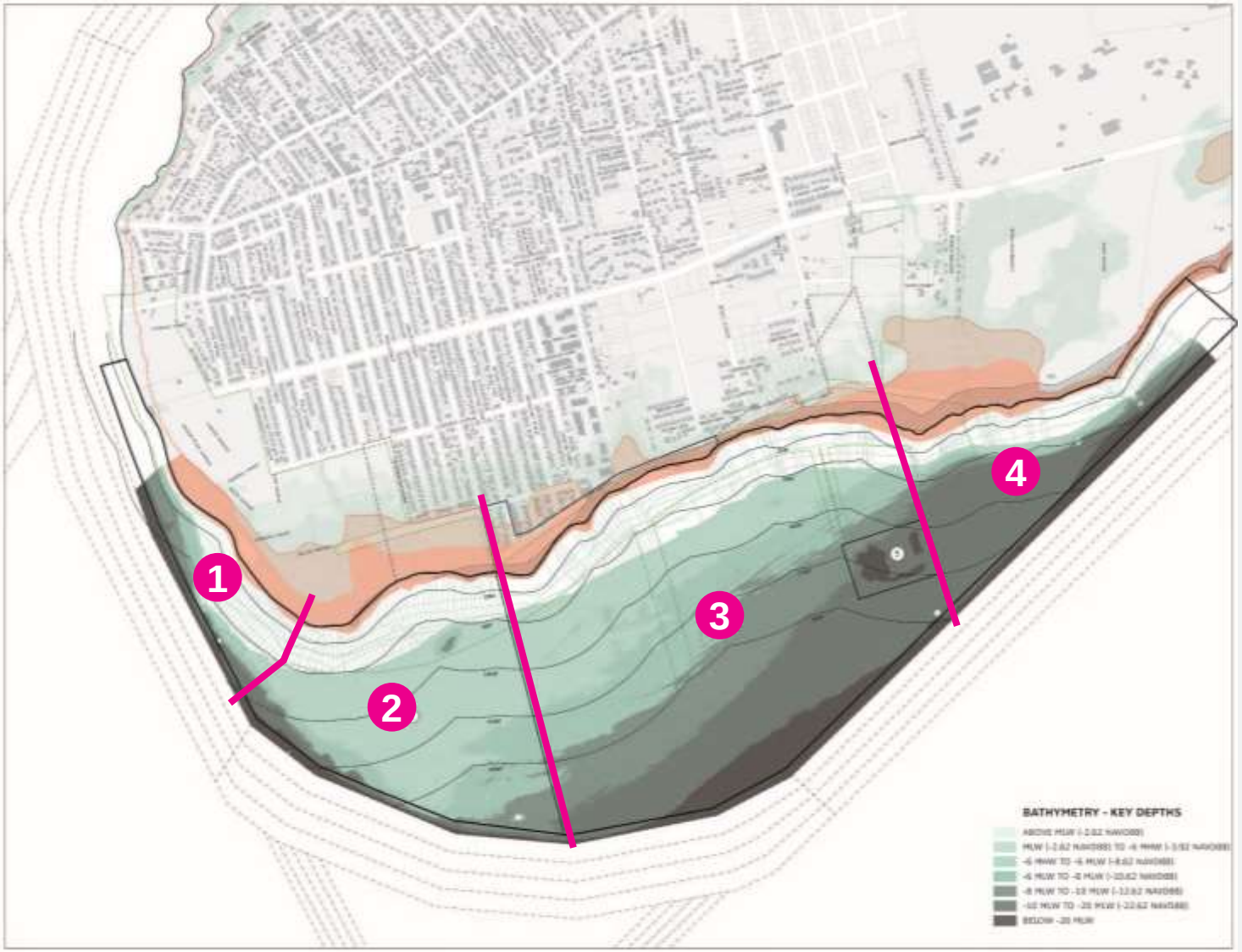

UNDERSTANDING THE PROJECT SITE

What do we need to consider where?

Potential Project "ZONES"

More info at the Breakwater Design table

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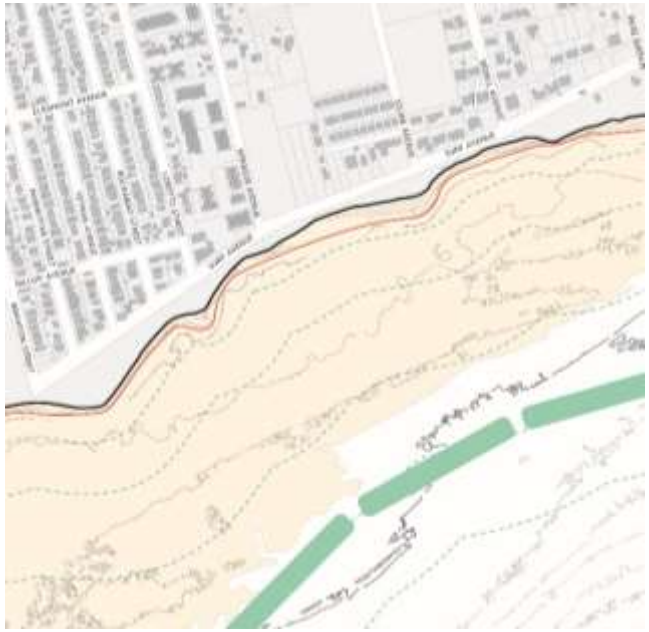

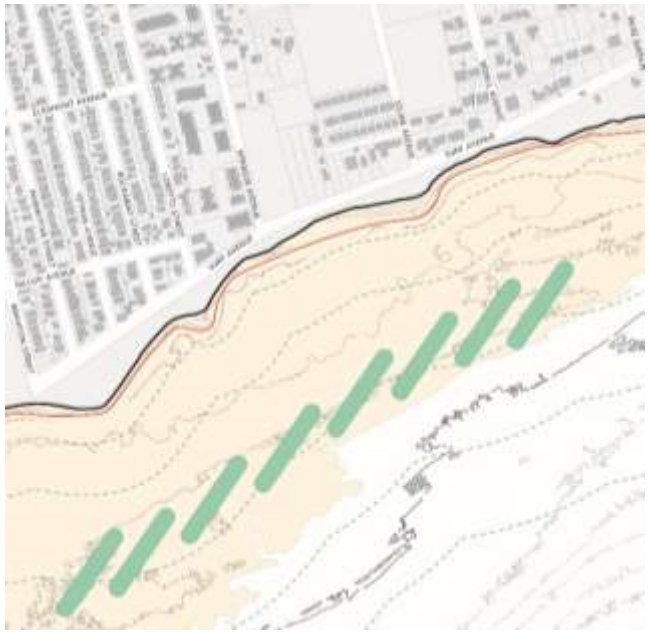

POTENTIAL BREAKWATER STRATEGIES

Need to consider

- **Distance to shore**
- **Segment length**
- **Spacing between segments**
- **Shape**
- **Orientation / configuration**
- **Water depth**

More info at the Breakwater Design table

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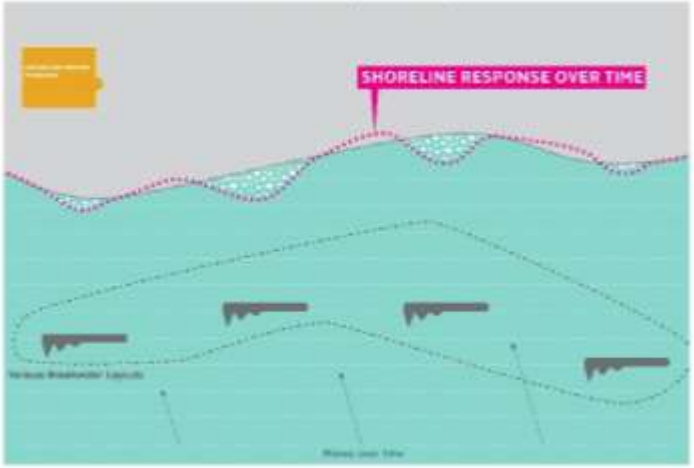
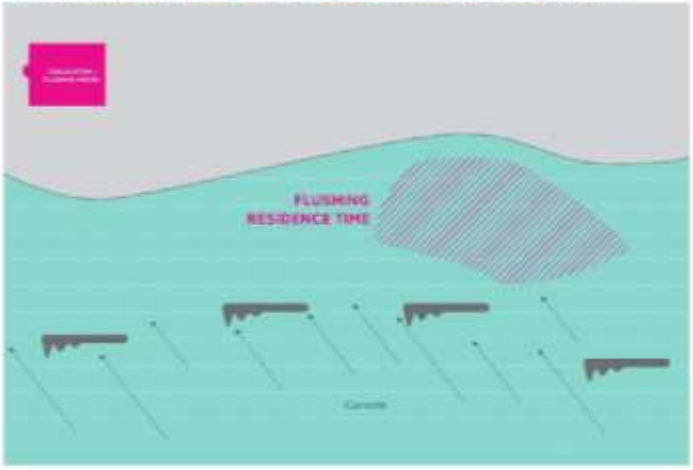
SHORELINE CHANGE MODELING (GENESIS)



WAVE CLIMATE - WAVE TRANSFORMATION MODELING (REF-DIF)

BEACH PROFILE RESPONSE MODELING (SBEACH)

CIRCULATION: INITIAL WATER QUALITY MODELING (DELFT)



BREAKWATER MODELING METHODOLOGY

Four computer models to look at:

- **Shoreline Change**
- **Beach Profile Change**
- **Wave Transformation**
- **Water Circulation**

More info at the Breakwater Design table

DEVELOPING DESIGNS

WHAT IT TAKES TO DESIGN A DUNE

1. Conditions Assessment
   a) Review Historic Data
   b) Collect and Analyze Existing Data

2. Determine Design Criteria

3. Preliminary Structure Geometry/Landscape Architectural Design

4. Preliminary Modeling

5. Model Refinements

6. Coordination!

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WHAT IT TAKES TO DESIGN A DUNE

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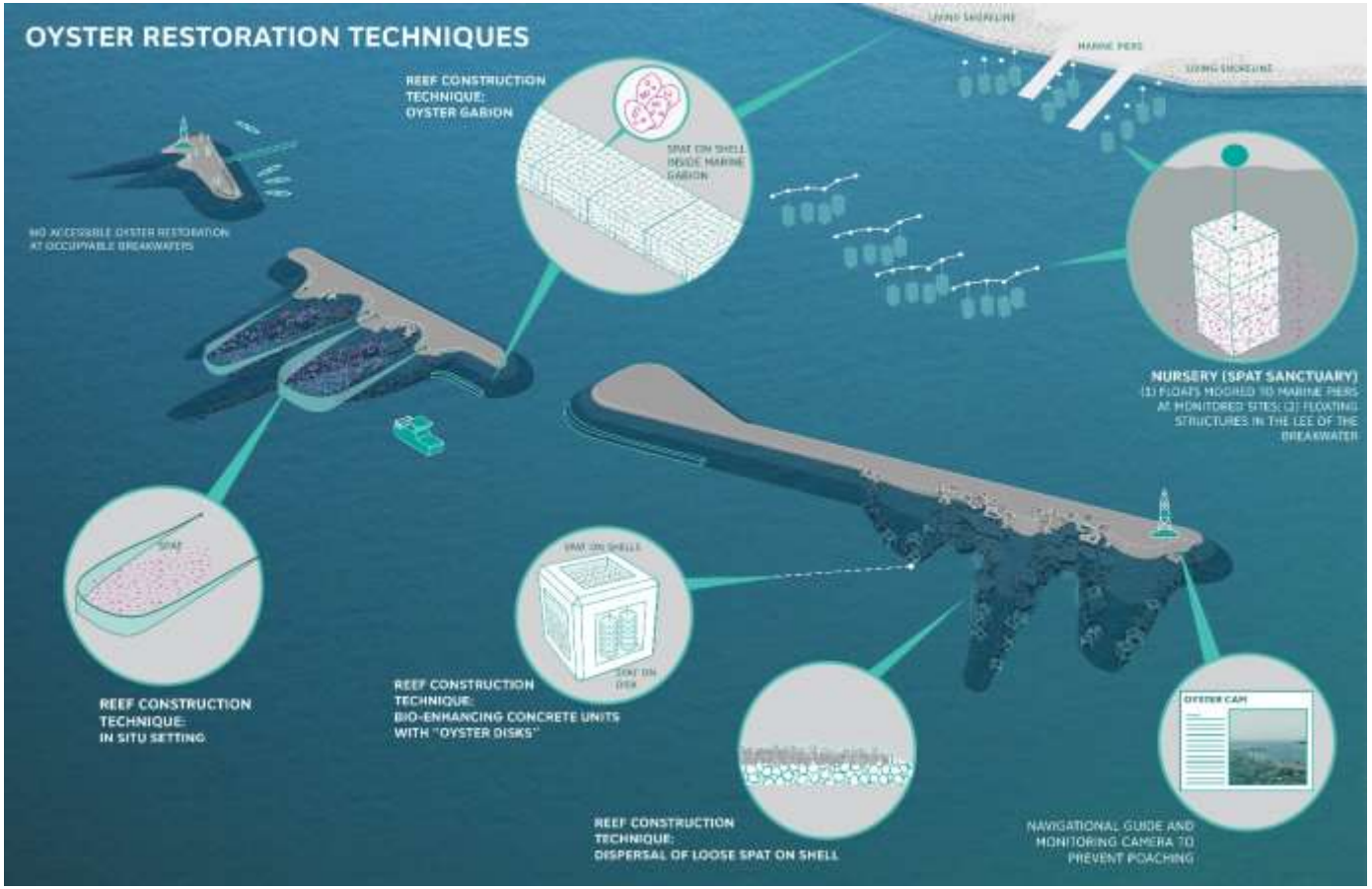
SPAT NURSERIES

- **Goal is to add more oyster larvae to the water column**
- **Great Kills Harbor (Richmond County Yacht Club) & Tottenville (TBD)**

More info at the Ecological Design table

OYSTER RESTORATION

Preliminary proposed techniques for restoration on breakwaters



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BREAK OUT TABLES & INFO SESSION

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TABLES

1. BREAKWATER DESIGN
2. ECOLOGICAL DESIGN & OYSTER RESTORATION
3. WATER HUB
4. DUNE AND SHORELINE EXPERIENCE
5. COMMUNITY OUTREACH AND ENGAGEMENT / ENVIRONMENTAL IMPACT STATEMENT

QUESTIONS?

Thank you !

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