

*2018 NH Coastal Climate Summit
Municipalities Rising to the
Climate Challenge*

Exeter Resilience Initiatives
Wastewater Treatment Facility Upgrades

Great Bay National Estuarine Research Reserve
Greenland, NH
June 20, 2018





Exeter WWTF Construction October 2017





Exeter WWTreatment Facility Construction June 2018







Swasey Park



Main Sewer Pumping Station



Squamscott River Flooding February 2010

DRAFT



**NATIONAL ESTUARINE
RESEARCH RESERVE SYSTEM
SCIENCE COLLABORATIVE**

**Project Title: Collaborative Planning for Climate Change Adaptation: A Case Study in
Great Bay National Estuarine Research Reserve (known as the Climate Adaptation
Planning for Exeter (CAPE) project)**

**A Final Report Submitted to the
National Estuarine Research Reserve System
Science Collaborative
August 15, 2015**

Additional Information added for Town of Exeter, August 31, 2105

**Project Start Date: September 1, 2012
Project Completion Date: June 30, 2015**

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CAPE Project DEPTH OF FLOODING NORTHEAST QUADRANT

2010
100-YEAR PRECIPITATION
Dam Out with Storm Surge
Date: 3/30/2015

LEGEND

- Active Ground Storage Tank
- ▲ Sewer Pump Station
- W Water Main Crossing
- Proposed Well
- Existing Well
- Post Model Limits (HSG-Rule)

Reference Flood Extents

- 2010 Davis 100-Year Mean High High Water

Flood Depths

2010 Davis 100-Year
Waters with Storm Surge

- 2-3 feet
- 3-6 feet
- 6-9 feet
- 9-12 feet
- 12-15 feet
- 15-18 feet

These maps have been created as part of a study to compare existing and future potential for water storage facilities. Flooding extents and depths shown are approximate and intended for planning purposes only for the Union County Adoption Planning for 2010 (CAPE) project funded by US EPA, 2010 year project report for model simulation details.

Source: 2010 CAPE HSG-Rule and HSG-Rule Hydrology & Hydraulic models, Town of Exeter, GRANITE GIS, 2010 GIS



Reference Locations

- RL-1: Sontag
- RL-2: Parker/Blackwater Lagoons
- RL-3: Parker/Blackwater Treatment Plant
- RL-4: Parker/Blackwater Treatment Plant
- RL-5: PSA Day Care Center
- RL-6: Senior Housing CTR
- RL-7: Town Hall
- RL-8: Town Library
- RL-9: Town Office

Critical Transportation

- RD-1: Old Road
- RD-2: County Parkway
- RD-3: Water Street

Recreational Areas

- RD-4: Hedges Park
- RD-5: Lagoon Trail
- RD-6: Park Street Corridor
- RD-7: Parker/Blackwater Park
- RD-8: Water Street



CAPE Depth of Flooding: 2010, 100-Yr w/Surge

CAPE Project DEPTH OF FLOODING NORTHEAST QUADRANT

2070 HIGH
100-YEAR PRECIPITATION
Dam Out with Storm Surge
Date: 3/30/2015

LEGEND

- Above Ground Storage Tank
- ▲ Ocean Pump Station
- ▼ Under Pump Station
- Proposed Well
- Existing Well
- Flood Model Limits (MCO-RAD)

Reference Flood Extents

2010 Dam-In 100-Year
WGIN High High Water

Flood Depths

2070 Dam-Out 100-Year
WGIN High High Water

- 0 - 3 feet
- 3 - 6 feet
- 6 - 9 feet
- 9 - 12 feet
- 12 - 15 feet
- 15 - 18 feet

These maps have been created as part
of a study to assess existing and future
potential climate change impacts.
Flooded areas and depths shown are
approximate and intended for planning
purposes only for the UNH Climate
Adaptation Planning for Greater (CAPG)
project funded by US NOAA. See final
project report for model simulation details.

SOURCES:

2014 CAPE HEC-HMS and HEC-RAS
Hydrologic & Hydraulic Model, Town of
Exeter, GRANIT 2014, MAY 2014 9:15



Release Locations

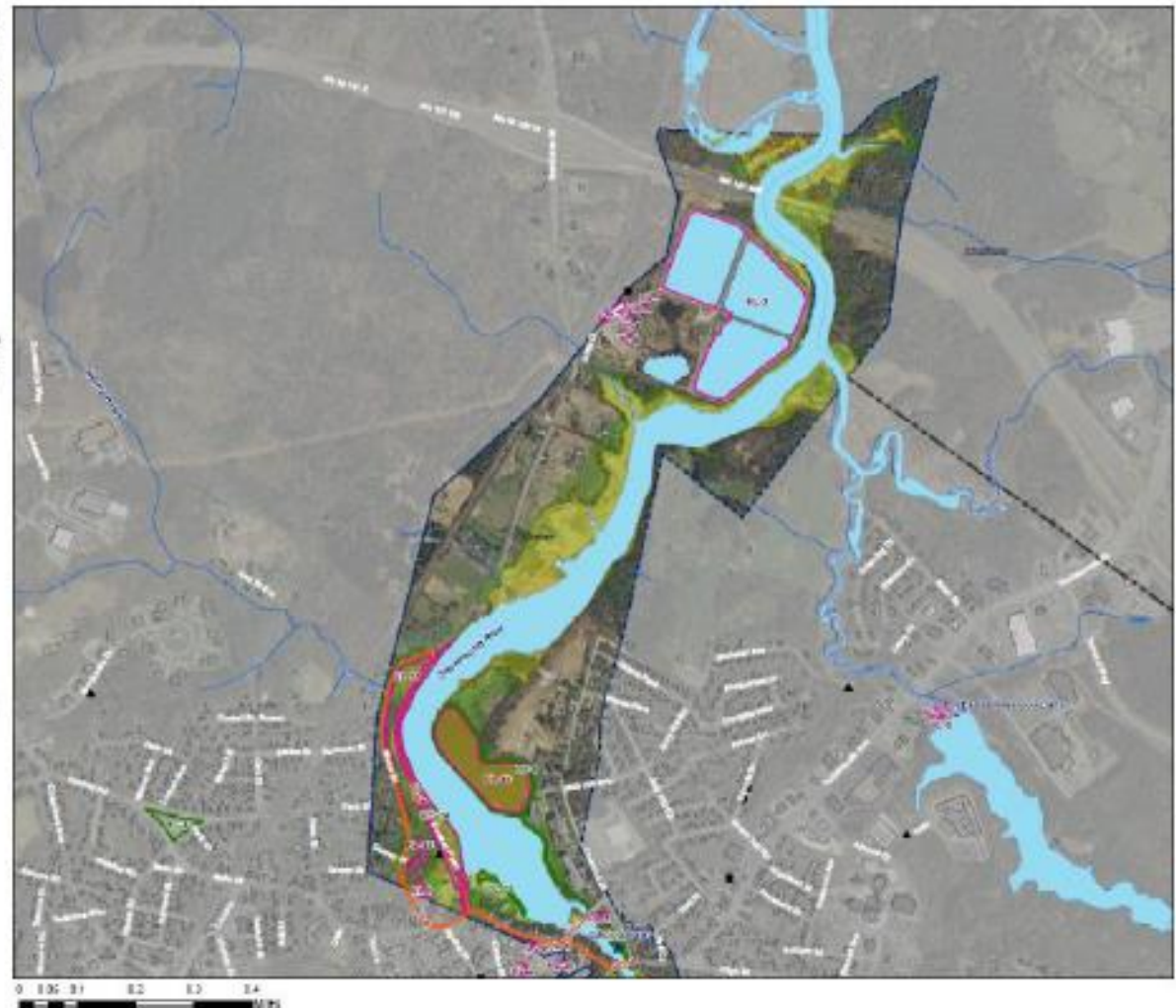
- RL-1: Sanderson
- RL-2: Exeter Wastewater
Lagoons
- RL-4: Exeter Wastewater
Treatment Plant
- RL-6: Exeter Water Treatment
Plant
- RL-8: IPA Oak Camp School
(000040)
- RL-10: Exeter Housing 277
Water St
- RL-16: Diamond Pond
- RL-17: Ramsey Park
- RL-18: Pease Hall
- RL-19: North Library
- RL-20: Town Offices

Critical Travelways

- RD-3: Living Bridge
- RD-7: Greedy Parkway
- RD-6: Water Street

Recreational Areas

- RD-6: Founders Park
- RD-8: Lagoon Trail
- RD-11: Park 200 at Garrison
- RD-13: Diamond Wastewater
Plant
- RD-14: Ramsey Park



CAPE Depth of Flooding: 2070, High

WWTF Design

FEMA Flood Insurance Rate Map

100 year flood: Elevation 8 MSL

CAPE

Projected 100-yr: El 14 (2070)

MAIN PUMP STATION

Squamscott River

First Floor EL 11.67

CAPE 2070 EL 14.0

Grade EL 8.0

100Yr Flood EL 8.0

Mean High EL 4.5

WASTEWATER TREATMENT FACILITY

Squamscott River

Headworks EL 35.33

Future Primary EL 30.0

Aeration Tanks and Upper Berms EL 28.0

Upper Site EL 24.0

Disinfection Tank EL 19.7

Lower Berms EL 17.0

CAPE 2070 EL 14.0

100Yr Flood EL 8.0

Mean High EL 4.5

For more information

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CAPE PROJECTED FLOODS

2010 EI 8

2040

2070 Low (with 2040 build-out) EI 11

2070 High (with 2070 build-out) EI 13

HISTORICAL FLOODS

October 1996 ~ 500 Year ???

Mother's Day Flood ~ 100 Year Flood

May 13 - 20, 2006

Peak streamflow 3,520 cfs @ Haigh Rd

Patriots Day Flood ~ 50 Year Flood

April 16 - 21, 2007

Peak streamflow 2,850 cfs @ Haigh Rd

Saint Patrick's Day Flood ~ 20 Year Flood

March 14 - 17, 2010

Peak streamflow 3,010 cfs @ Haigh Rd

April Fool's Flood – 5 Year Flood

April 1 - 4, 2004

Peak streamflow 1,960 cfs @ Haigh Rd



WWTP Enhanced

Nutrient Removal \$54 M

Inflow/Infiltration \$20 M

Sewer Mains \$10 M

Total \$84M

