

Zouti estanda konsepsyon RMAT pou rezistans klima

Apèsi sou lekòl la
Jen 2024



ResilientMass
Climate Adaption Clearinghouse
for the Commonwealth



Objektif Zouti yo:

- Fè analiz preliminè rezistans klimatik pi lajman aksesib
- Enfòme "**klima entelijan**" planifikasyon kapital, konsepsyon pwojè ak akizisyon
- Bay rekòmandasyon ki baze sou **itilizasyon ki konsistan** nan done klima eta a
- Bay yon zouti sipò planifikasyon ak konsepsyon inifye ajans leta yo ka itilize pou administre pwogram sibvansyon yo
- Bay enfòmasyon ki konsistan pou minisipalite yo òganize sou **resilient.mass.gov**

Lyen ak
zouti

Lyen pou
zouti

Log-in/lansman zouti



TOOLS & DATA ▾

LEARN ▾

[Resource Clearinghouse](#)

[Maps and Data Center](#)

[Climate Resilience Design Standards & Guidance](#)

[Guides for Equitable & Actionable Resilience \(GEAR\)](#)



Climate Resilience Design Standards Tool

Apply statewide data to assess the climate resilience of your project site.

[LEARN MORE >](#)



ResilientMass Maps

Explore the latest state projections.

[LEARN MORE >](#)

Climate Resilience Design Standards Tool



Log in or register below to use the Tool (Version 1.2).

[LOG-IN / REGISTER >](#)

[State Users Log-in >](#)

For state staff requesting first time access, please email rmat@mass.gov

[Tool User Guide](#)

[Tool Training Video](#)


<https://resilient.mass.gov/>

Lè pou itilize zouti sa a:

Rezilta Zouti yo bay yon baz diskisyon pou planifikasyon, konsepsyon bonè, ak evalyasyon ki estandadize atravè Commonwealth la ki baze sou kalite byen, kote, kritik, kalite konstriksyon, ak lavi itil nan byen fizik.

- Planifikasyon pwojè, konsepsyon ak akizisyon
- Anplasman pwojè
- Amelyore yon aplikasyon sibvansyon leta

Climate Resilience Design Standards Tool



Log in or register below to use the Tool (Version 1.2).

[LOG-IN / REGISTER >](#)

[State Users Log-in >](#)

For state staff requesting first time access, please email rmat@mass.gov

[Tool User Guide](#) [Tool Training Video](#)

https://resilient.mass.gov/rmat_home/designstandards/

Resous kle ki disponib:

Log in or register below to use the Tool (Version 1.2).

LOG-IN / REGISTER >

State Users Log-in >

For state staff requesting first time access, please email rmat@mass.gov

Tool User Guide

Tool Training Video

Climate Resilience Design Standards Tool
Version 1.2, July 2022

Table of Contents

1. CLIMATE RESILIENCE DESIGN STANDARDS TOOL.....2

1.0. How to Use this Document.....2

1.1. Introduction to the Tool.....2

1.2. Key Tool Pages.....4

2. TOOL FUNCTIONALITY AND FEATURES.....7

2.1. General Functionality.....7

2.2. Page: Start Here.....8


2.3. Page: Locate Project.....11

2.4. Page:.....


2.5. Page:.....

2.6. Page:.....

2.7. Page:.....




Climate Resilience Design Standards Tool
Resilient MA Action Team





Project Search

Project Name



Advanced Query



Clear Search

Search

New Project

Tool (V1.2) Training Video - February, 2023

Guidance and Best Practices

The Climate Resilience Design Guidance provides general design guidance to consider while implementing resilience principles that are not specific to project type or climate hazards, and are illustrated through exam the Guidance considerations and document decision making throughout the planning process.

Guidance and Best Practices PDF

Additional forms include:

- [Site Suitability](#)
- [Regional Coordination](#)
- [Flexible Adaptation Pathways](#)

Gid pou konsepsyon rezistans klimatik ak pi bon pratik

Table 1.1. Climate Resilience Design Guidance Best Practices

Considerations	Best Practice
Site Suitability (SS)	1. Reduce exposure to climate hazards 2. Mitigate adverse climate impacts and provide benefits 3. Protect, conserve, and restore critical natural resources on-site and off-site
Regional Coordination (RC)	1. Assess regional context of vulnerability 2. Evaluate impacts beyond site-specific design 3. Optimize capital investment opportunities 4. Prioritize services and assets that serve vulnerable populations
Flexible Adaptation Pathways (AP)	1. Embed future capacity and design for uncertainty 2. Design for incremental change 3. Encourage climate mitigation and other co-benefits 4. Prioritize nature-based solutions 5. Prepare for current and future operational and maintenance needs

Dokimantasyon ak fòmasyon pou antre done teknik:

- [Massachusetts Coast Flood Risk Model \(MC-FRM\) FAQ](#) (April 6, 2022)
- [Massachusetts Coast Flood Riks Model \(MC-FRM\) Online Trainings](#) (April-May 2023)
- [EEA's Climate and Hydrologic Risk Project - Weather Generator Technical Document](#) (April, 2022)
- [EEA's Climate and Hydrologic Risk Project - IDF Curves Technical Document](#) (December, 2021)

https://resilient.mass.gov/rmat_home/designstandards/

Gid itilizatè

Videyo fòmasyon

Kòmanse

Konekte nan:

https://resilient.mass.gov/rmat_home/designstandards/

Itilizatè ekstèn yo dwe swiv sòsyè enskri pou aksè premye fwa

Itilizatè Eta yo ta dwe mande pou premye fwa aksè nan rmat@mass.gov

*Tan adisyonèl nesesè pou nouvo kont zouti ak @dot.state.ma.us adrès imèl

Rechèch pou pwojè ki egziste deja,

OSWA

Klike sou "Nouvo Pwojè" Komanse

Climate Resilience Design Standards Tool

Log in or register below to use the Tool (Version 1.2).

LOG-IN / REGISTER >

State Users Log-in >

For state staff requesting first time access, please email rmat@mass.gov

[Tool User Guide](#) [Tool Training Video](#)

Climate Resilience Design Standards Tool

Resilient MA Action Team

Project Search

Project Name

Advanced Query

Clear Search Search

New Project


Antre pwojè


Tool Reporting Workflow





Trase anprent
pwojè a

Draw Project Area
You must draw a polygon on the map representing the project area.

1. Find the project location using the map zoom/pan and/or the address search bar in the upper right area of the map.
2. Draw the polygon using the drawing tools under the search bar.
3. Click the  icon when you are satisfied with the polygon.


Find address or place 1 


2 



3 

[Show me how](#)

Map View Additional Documents and Resources

Find address or place 

1 Feature 

South Salem

Palmer Cove Park & Playground

Palmer Point

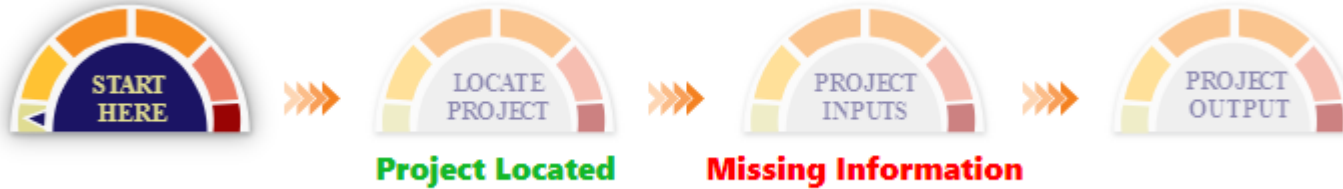
Esri, NASA, NGA, USGS, FEMA | Esri Community Maps Contributors, MassGIS, BuildingFootprintUSA, Esri Canada, Esri, HERE, Garmin, I

Powered by Esri

Desen
zouti

Antre pwojè

Tool Reporting Workflow



Map View

i Project Inputs

i Project Outputs

Additional Documents and Resources

Step 1

Core Project Information

(Click each question to answer and save. All questions in red are required)



Step 2

i Project Ecosystem Services Benefit

(Please identify whether the project provides the following ecosystem services benefits to the project site or surrounding area)



Step 3

Project Climate Exposure

(Click each question to answer and save. All questions in red are required)



Step 4

i Project Assets



Reponn kesyon opinyon pou kat etap:

1. Enfòmasyon pratik
2. Benefis anviwònman pwojè a
3. Istwa ekspozé a danje
4. Byen enfòmasyon espesifik

Antre pwojè

Tool Reporting Workflow



Dewoulman travay la ogmante yon fwa done yo te antre

Step 2 Project Ecosystem Services Benefit

2yèm ETAP:

Benefis anviwònman an nan pwojè a

- Provides flood protection through green infrastructure or nature-based solutions No
- Provides storm damage mitigation No
- Provides groundwater recharge No
- Protects public water supply No
 - Filters stormwater No
 - Improves water quality No
- Promotes decarbonization Yes
- Enables carbon sequestration Yes
- Provides oxygen production No
 - Improves air quality No
 - Prevents pollution Yes
- Remediates existing sources of pollution No
- Protects fisheries, wildlife, and plant habitat No
- Protects land containing shellfish No
 - Provides pollination No
 - Provides recreation No

Gid (i)

Step 3 Project Climate Exposure

3yèm ETAP:

Istwa ekspozè danje

- Does the project site have a history of coastal flooding? Yes
- Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)? No
- Does the project result in a net increase in impervious area of the site? No
- Does the project site have a history of riverine flooding? No
- Are existing trees being removed as part of the proposed project? No

Step 4 Project Assets

4yèm ETAP:

Enfòmasyon espesifik atif yo

Building/Facility Add

UserGuide Building

Infrastructure Add

N/A

Natural Resources Add

N/A

Selected Asset: UserGuide Building
Asset Type: Typically Occupied
Asset Sub-Type: Residential building - Public Housing
Construction Type: Maintenance (critical repair)
Construction Year: 2025
Useful Life: 15

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.

Building must be accessible/operable at all times, even during natural hazard event

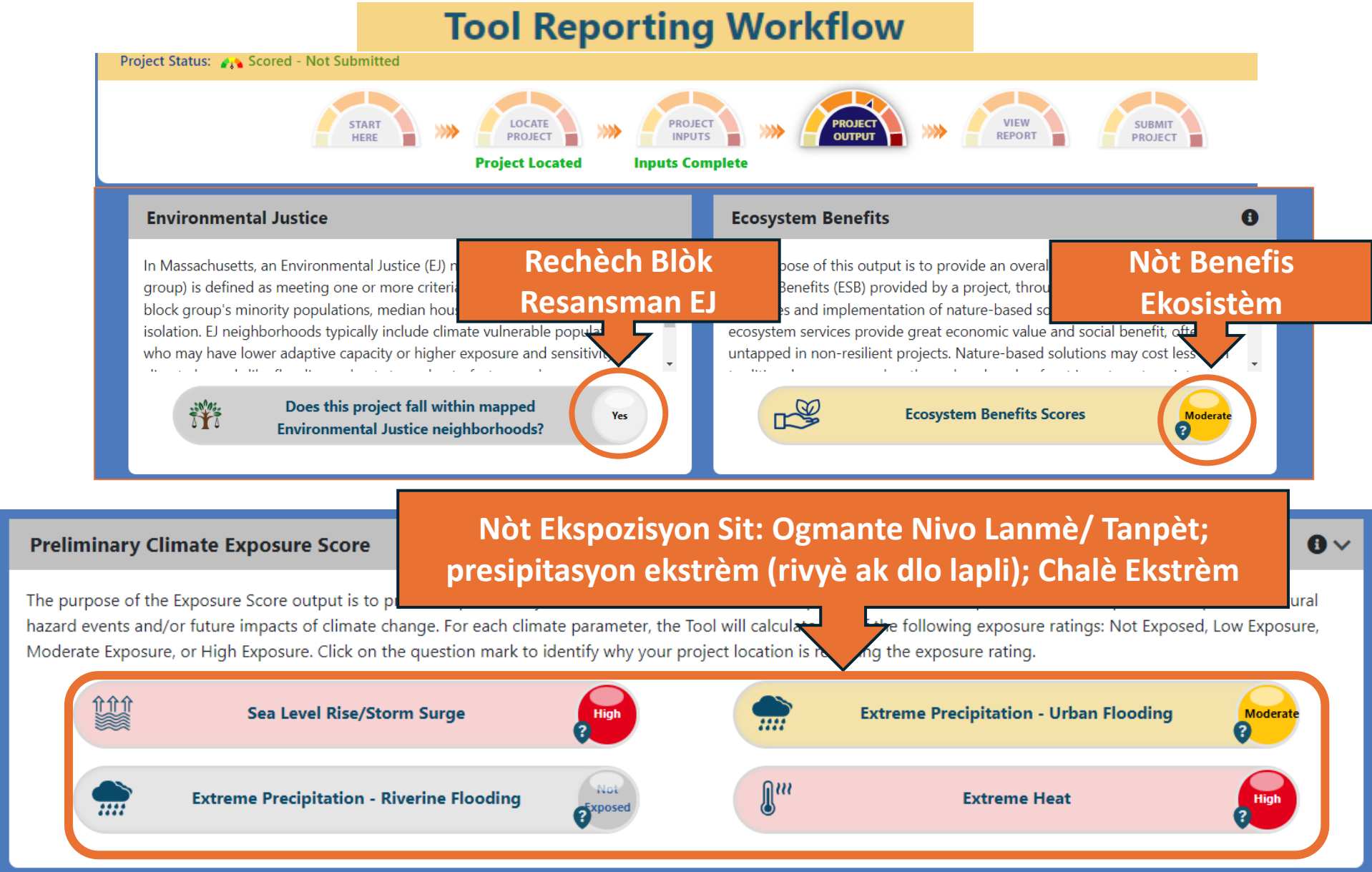
Identify the geographic area directly affected by permanent loss or significant inoperability of the building/facility.

Impacts would be limited to local area and/or municipality

Identify the population directly served that would be affected by the permanent loss of use or inoperability of the building/facility.

Less than 1,000 people

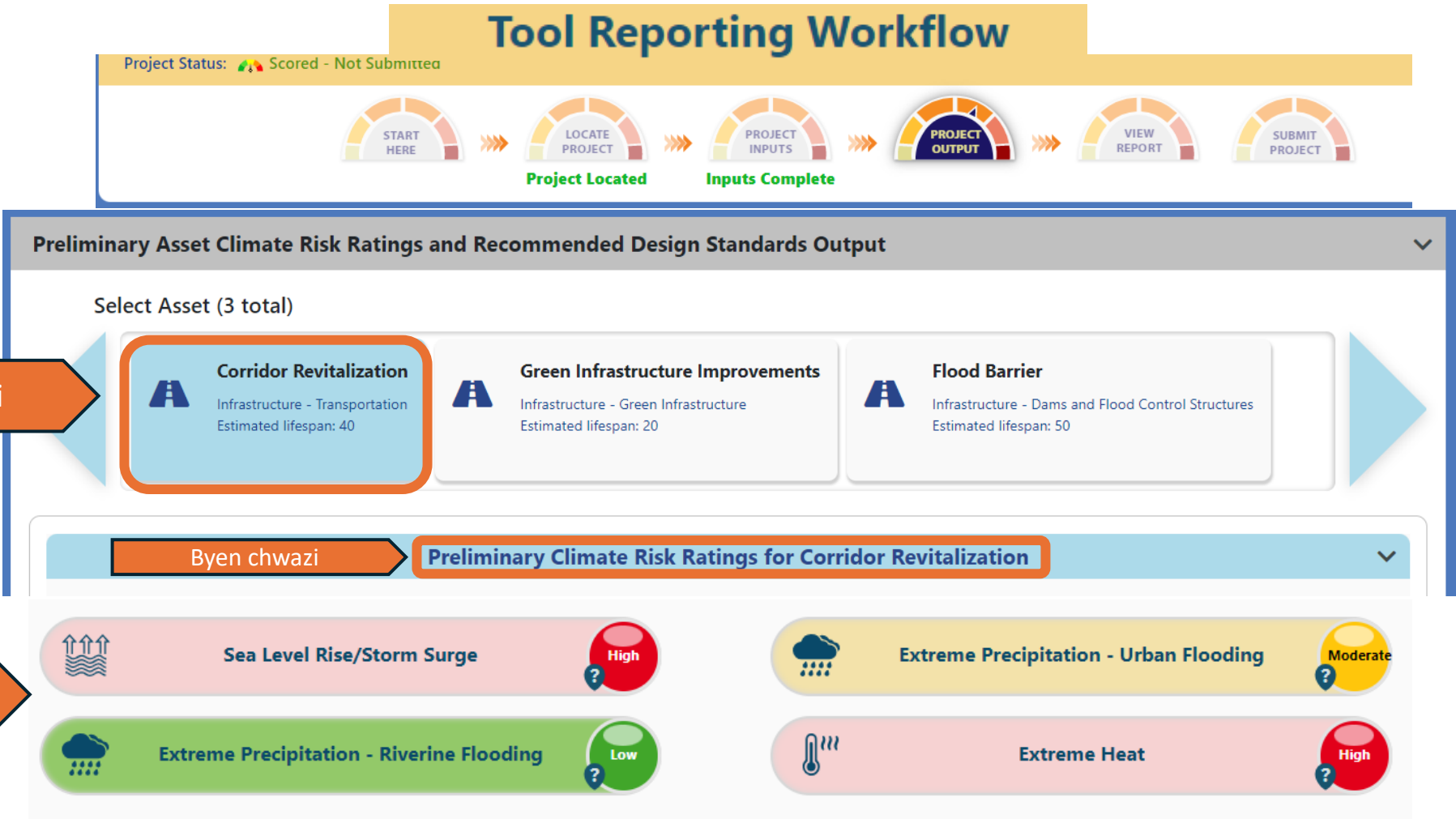
Rezilta: Nòt Nivo Pwojè



Rezilta: Nòt Nivo Pwojè



Sòti: Evalyasyon risk klima aktif yo



Byen chwazi

Pwojè zouti ka akomode plizyè byen

Evalyasyon Risk Aktif

Pral resevwa **risk** evalyasyon klimatik pou **chak byen** ki te antre

REMAK: Pandan li posib pou jwenn yon nòt **pwojè** "pa ekspoze" pou "Ogmantasyon Nivo Lanmè/Vag Tanpèt" oswa "Presipasyon Ekstrèm - Inondasyon Rivyè" paske li depann jeyografikman, zouti a ap toujou bay yon **nòt risk** (enferyè).

Rezilta: Estanda/Kritè Konsepsyon (Inondasyon Kòt)

Non Pwojè Aktiv

Recommended Climate Resilience Design Standards and Guidance for Pump Station

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (intermediate and/or target), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change.

Each applicable design criteria dropdown has additional design standards and guidance. **Some design criteria dropdowns provide numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.** More information, including design criteria definitions, guidance for planning, early design, and evaluation processes, and limitations is provided in the dropdowns below.

Danje Klimatik



Sea Level Rise/Storm Surge



Extreme Precipitation



Extreme Heat

Design Standards

Projected Water Surface Elevation Maps

Kat kontèks; Lòt kat MC-FRM k ap vini pandan ETE 2024!

Target Planning Horizon: 2070



Intermediate Planning Horizon: 2050



Return Period: 50-yr (2%)



Estanda:

Faktè yo itilize pou kalkile/chwazi valè ki baze sou opinyon pwojè yo

Kritè konsepsyon ak valè
(pou byen chwazi)

Design Criteria Applicable for Pump Station



Projected Tidal Datums



Projected Water Surface Elevation



Projected Wave Action Water Elevation



Projected Wave Heights



Projected Duration of Flooding



Projected Design Flood Velocity



Projected Scour & Erosion

Sous nan MC-FRM

Pifò nan kritè konsepsyon kotyè pwojè yo
soti nan **Massachusetts Coast Flood Risk
Model (MC-FRM)**

Rezilta: Konsey Valè Konsepsyon (Inondasyon Kòt)

Design Criteria Applicable for Pump Station

✓ Projected Tidal Datums

✓ Projected Water Surface Elevation

Non Estanda Konsepsyon/Valè

Definition

Projected Water Surface Elevation is the projected elevation for a specific future flood event, considering storm surge, tides, and wave setup. Wave setup, as included in water surface elevation, is defined by FEMA as “an increase in the total stillwater elevation against a barrier (dunes, bluffs, or structures) caused by breaking waves.” (https://www.fema.gov/sites/default/files/2020-02/Coastal_Wave_Setup_Guidance_Nov_2015.pdf).

Projected Water Surface Elevation Values:

Eksplikasyon sou valè

The projected modeled elevations may vary across large sites due to variations in the site’s physical characteristics. The elevations are presented as a maximum, minimum, and area weighted average values in the table below. The area weighted average value corresponds to the projected Water Surface Elevation of the project site.

Asset Name	Recommended Planning Horizon	Recommended Return Period	Max	Min	Area Weighted Average ⓘ
			(ft - NAVD88)		
Pump Station	2050	2% (50-Year)	12.1	12.0	12.0
	2070		13.9	13.8	13.8

How Water Surface Elevation may inform Planning

How Water Surface Elevation may inform Early Design

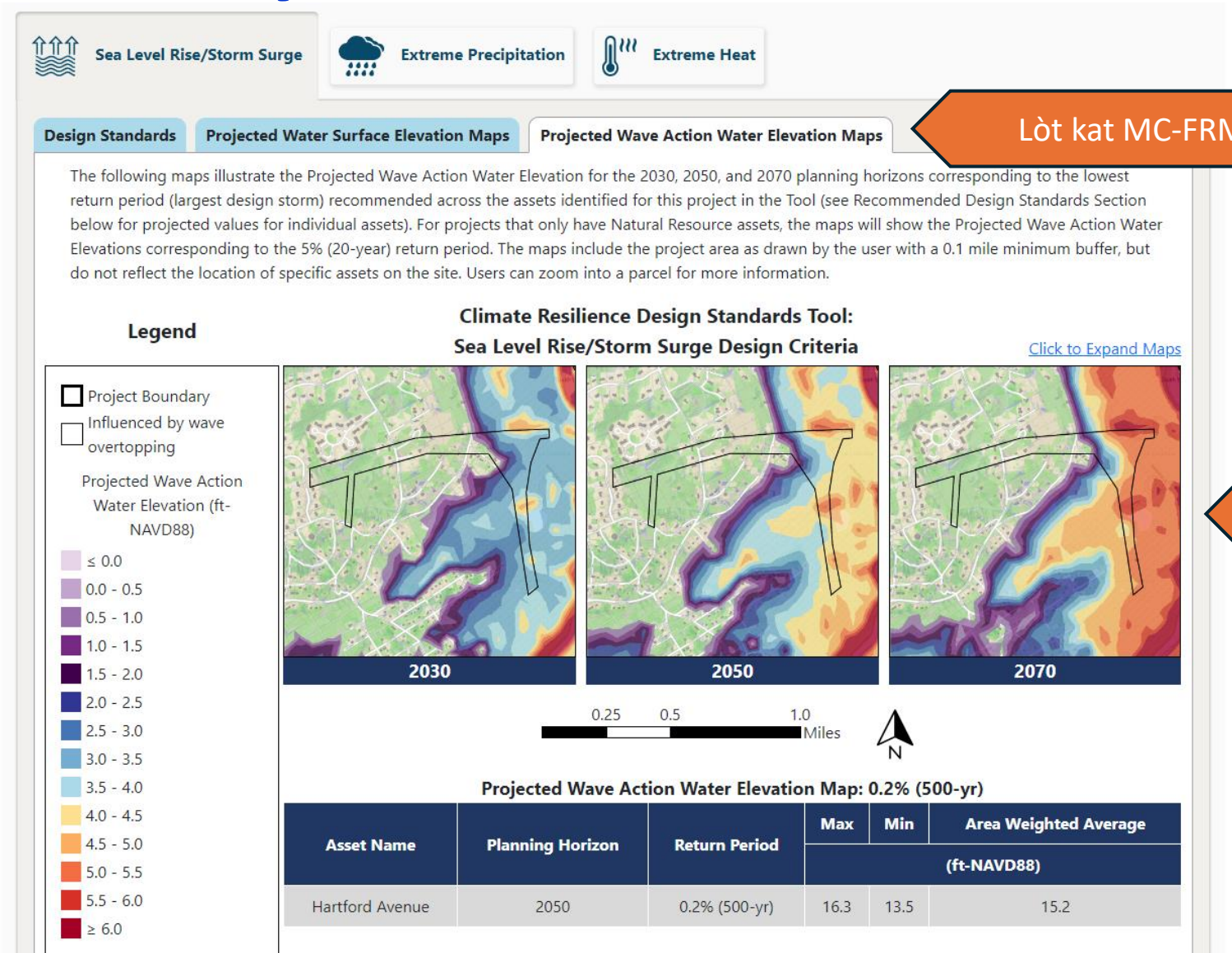
How Water Surface Elevation may inform Project Evaluation

Limitations for Projected Water Surface Elevation Values, Standards, and Guidance

Valè (yo) pou byen chwazi yo

Gid sou fason pou itilize valè pandan Planifikasyon, Konsepsyon Bonè, ak Evalyasyon Pwojè (egzanp, MEPA)

Sòti: Kat Inondasyon Kòt



Sòti: Estanda/Kritè Konsepsyon (Presipasyon)

Sea Level Rise/Storm Surge

Extreme Precipitation

Danje Klimatik

Target Planning Horizon: 2050

Return Period: 100-yr (1%)

Design Criteria Applicable for Test2050

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms

Definition

Total Precipitation Depth for 24-hour Design Storms is the total amount of rain in inches that falls over a period of 24-hours. It can be any 24-hour period, not just a traditional calendar day. This is given for a specific design storm (return period) such as the 100-year or 10-year storm (1% or 10%). Peak Intensity is the maximum rate of rainfall in inches per hour of a 24-hour design storm*.

Projected Total Precipitation Depth and Peak Intensity values can be used to assess potential flooding impacts and inform design of green and grey infrastructure solutions to mitigate flooding and manage stormwater.

Projected Total Precipitation Depth Values and Peak Intensity

The Tool uses climate projections developed by Cornell University. Assets receive a projected value for the 24-hour Total Precipitation Depth associated with a recommended return period (design storm) and planning horizon.

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Test2050	2050	100-Year (1%)	9.9	Downloadable Methodology PDF

ATTENTION: This is a Tier 3, Dams & Flood Control Structures project. Due to the criticality and useful life of this project, it is recommended that NCHRP15-61 methodology be used to calculate total precipitation depth for 24-hour design storms, and those results be compared to the provided total storm depth output: [Tier 3 methodology PDF](#).

How Total Precipitation Depth may inform Planning

How Total Precipitation Depth may inform Early Design

How Total Precipitation Depth may inform Project Evaluation

Limitations for Projected Total Precipitation Depth & Peak Intensity, Standards, and Guidance

Kritè konsepsyon ak valè (pou byen chwazi)

Estanda: Faktè yo itilize pou kalkile/chwazi valè ki baze sou opinyon pwojè yo

Valè pou byen chwazi

Pral resevwa estanda ki rekòmande ak kritè konsepsyon pou **chak byen** yo an tre

Eksplòre **valè presipitasyon** tanpèt konsepsyon adisyonèl sou tablodbò ekstèn:

<https://mass-eoea.maps.arcgis.com/apps/dashboards/2e8534bc2a7849b0aa6f64d0f79a8937>

Sòti: Estanda/Kritè konsepsyon (tanperati)

Sea Level Rise/Storm Surge

Extreme Precipitation

Extreme Heat

Danje Klimatik

Target Planning Horizon: 2050

Percentile: 50th Percentile

Design Criteria Applicable for Hartford Avenue

Projected Annual/Summer/Winter Average Temperatures

Definition

Projected Annual/Summer/Winter Average Temperature Value

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Annual Average Temperature [°F]	Projected Summer Average Temperature [°F]	Projected Winter Average Temperature [°F]
Hartford Avenue	2050	50th	56.15	73.97	38.21

How Annual/Summer/Winter Average Temperatures may inform Planning

How Annual/Summer/Winter Average Temperatures may inform Early Design

How Annual/Summer/Winter Average Temperatures may inform Project Evaluation

Limitations for Average Annual/Summer/Winter Temperature Standards and Guidance

Kritè konsepsyon ak valè (pou byen chwazi)

Estanda:
Faktè yo itilize pou kalkile/chwazi valè ki baze sou opinyon pwojè

Valè (yo) pou byen chwazi yo

NOUVO
APARANS/FONKSYONALITE
KAP VINI ETE 2024!

Telechaje Rapò Pwojè a

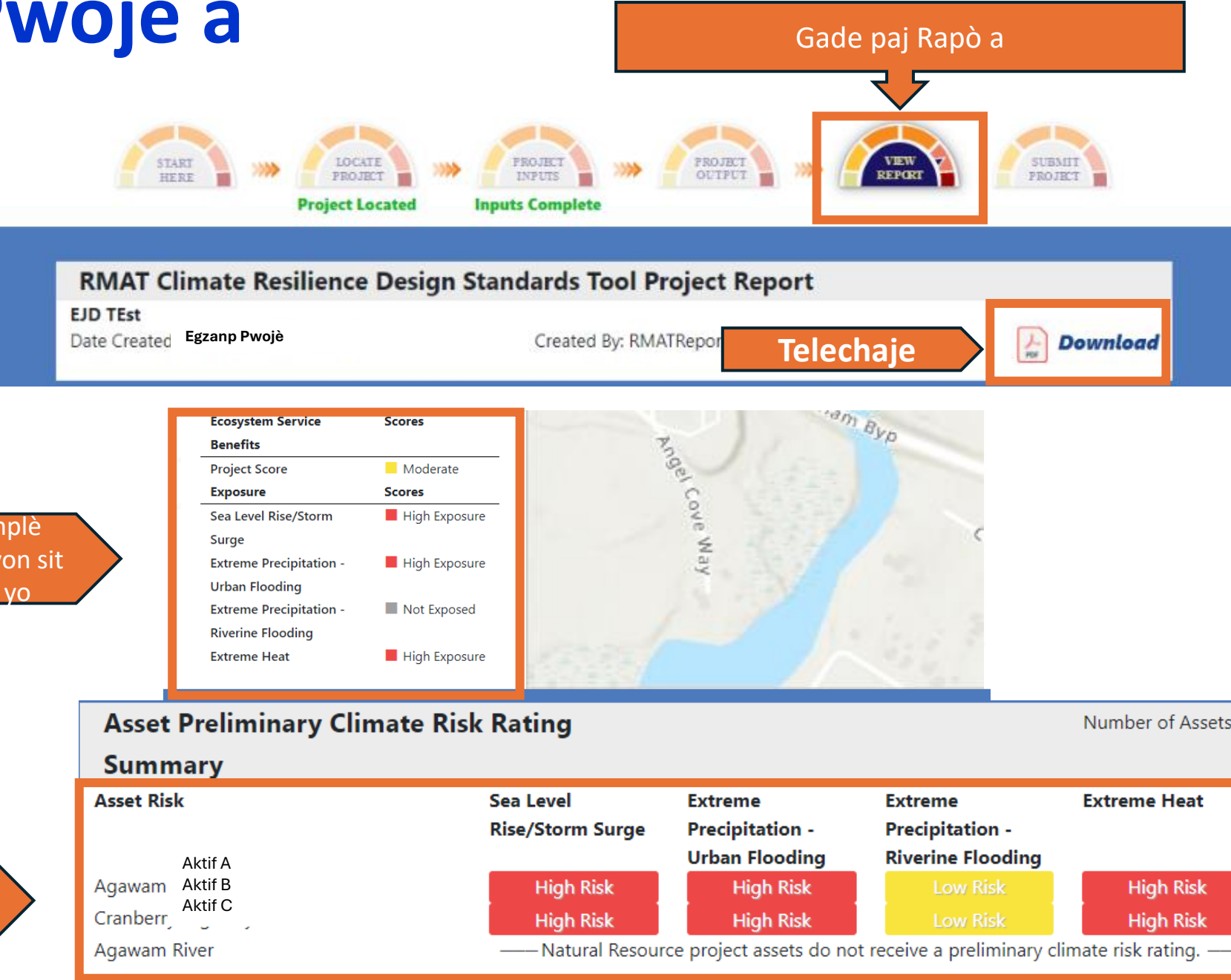
Afiche rezime rapò a sou **View Report** paj pwosesis travay

Telechaje rapò pwojè a sou fòm PDF
Klike sou **"Soumèt"** rapò

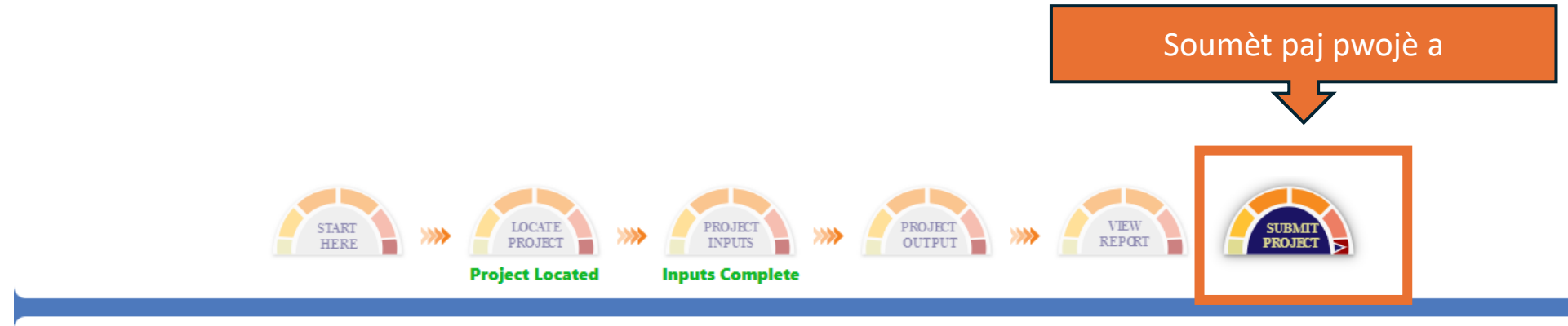
Telechaje/aneke fichye PDF nan pòtal sibvansyon respektif/depoze MEPA

Evalyasyon Risk Aktif
(pou chak byen)

Nòt konplè ekspozisyon sit pwojè yo



Soumèt Rapò Pwojè



SUBMIT PROJECT

This project has not been submitted

Once you have answered all Project Input questions and reviewed your Project Outputs and Report, you are ready to submit your project. Until submitted, you may continue to edit the project inputs.

Submission is not required to view Project Outputs or download a Report (available on "View Report" tab), but may be requested in accordance with guidelines from grant programs, or state planning or review processes.

Only submitted projects are searchable and accessible to Commonwealth administrators.


Once you click "Submit Project", project information will be saved, and the "Download Report" icon will appear to download the latest report version. You are not able to edit your project information once you click Submit.

Klike sou **"Soumèt"**
rapò

Soumèt

Submit Project

Zouti vèsyon istwa



Zouti Beta (avril 2021)

- MVP ak Massworks te mande zouti rapò nan aplikasyon pou sibvansyon

Vèsyon 1.0 (fevriye 2022)

- Mizajou ekspozisyon klimatik
- Mizajou benefis sèvis ekosistèm yo
- Lòt konsèy nan zouti

Vèsyon 1.1 (avril 2022)

- **Rezilta MC-FRM Nivo 2** (tablo dinamik pou kritè konsepsyon kotyè ki aplikab yo)
- Pwojè Risk idwolojik klimatik MA (tablo dinamik pou kritè konsepsyon presipitasyon ekstrèm ki aplikab)

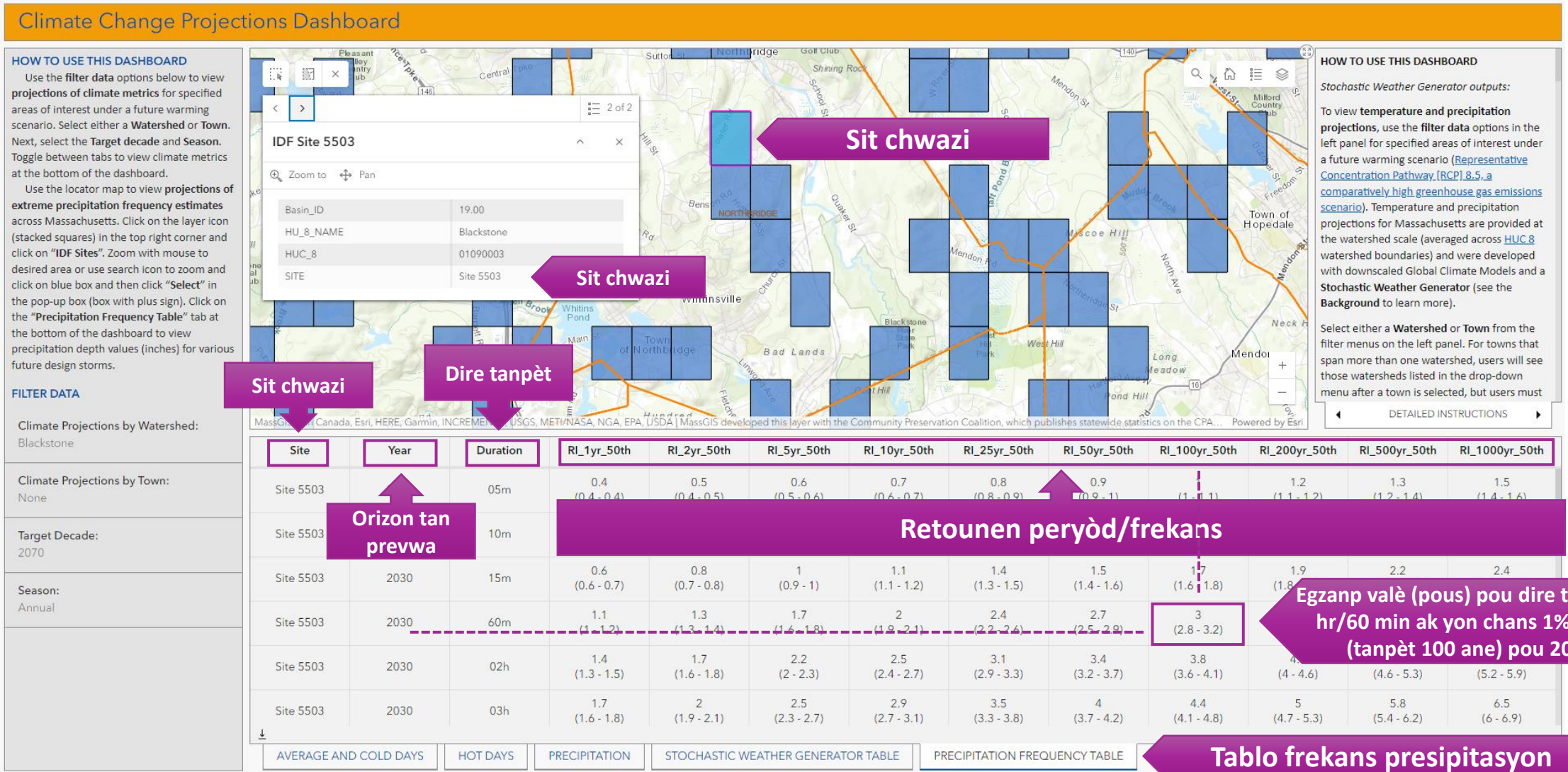
Vèsyon 1.2 (Jiyè 2022)

- **MC-FRM Pwojete Kat Elevasyon Sifas Dlo** (koòdone entèaktif nan zouti ak kat enprime nan rapò pwojè)

Vèsyon 1.3 (2024) - an pwogrè

- Mizajou nan estanda konsepsyon tanperati (**ajoute** valè kalkile nan koòdone zouti)
- Lòt kat MC-FRM (**Kalkil nivo dlo akòz aksyon vag**)
- Koreksyon ensèk

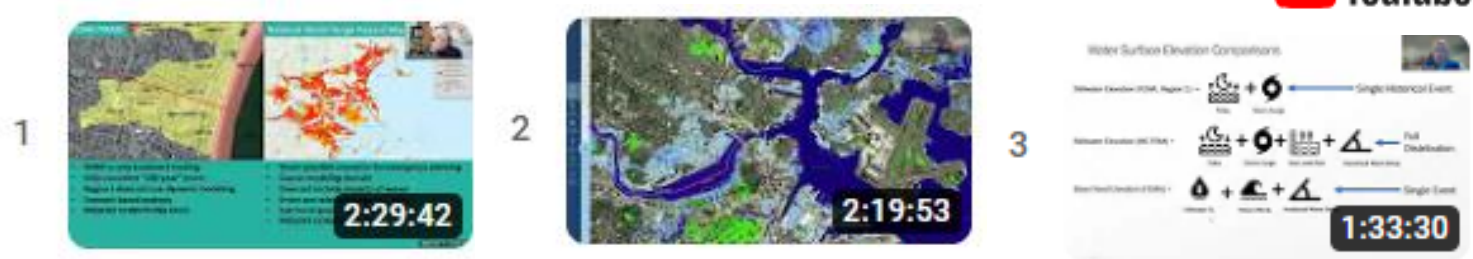
Resous ki gen rapò: Valè presipitasyon ki enfòme sou klima (Entansite-Dire-Frekans)



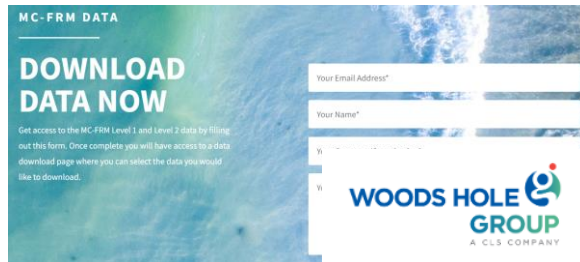
Modèl Risk Inondasyon Kòt Massachusetts

Resous ki gen rapò: (Massachusetts Coast Flood Risk Model, MC-FRM)

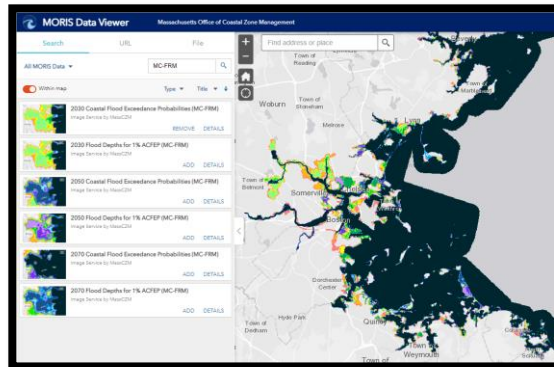
Videyo fòmasyon



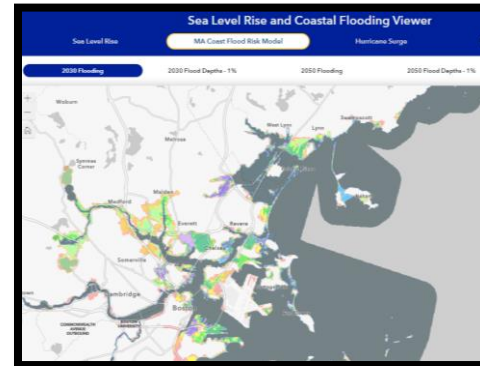
Telechaje Paj Done



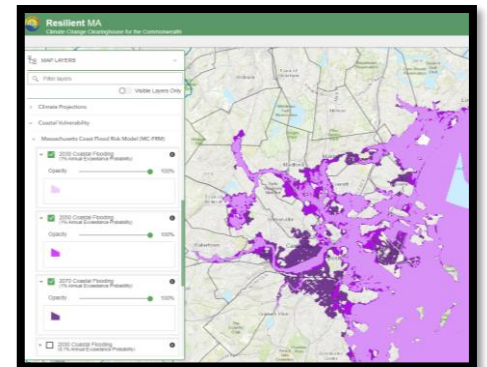
Espektatè Done Eta yo



Done Viewer MORIS CZM



Ogmantasyon nivo lanmè CZM a ak Viewer inondasyon kotyè yo



ResilientMass Climate & Hazards Viewer



ResilientMass

Climate Adaption Clearinghouse
for the Commonwealth

Kontakte
rmat@mass.gov
pou nenpòt kesyon!

*NÒT: Pa gen okenn anplwaye apentant devwe pou sipòte pwoblèm teknik ki gen rapò ak zouti a, kidonk, tanpri pèmèt omwen twa a senk jou ouvrap pou rezoud pwoblèm yo.