

## Massachusetts State Hazard Mitigation and Climate Adaptation Plan



September 2018

# RMAT

Resilient Massachusetts Action Team

Climate Resilience Design Standards –  
Coastal Projects

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Environmental Affairs

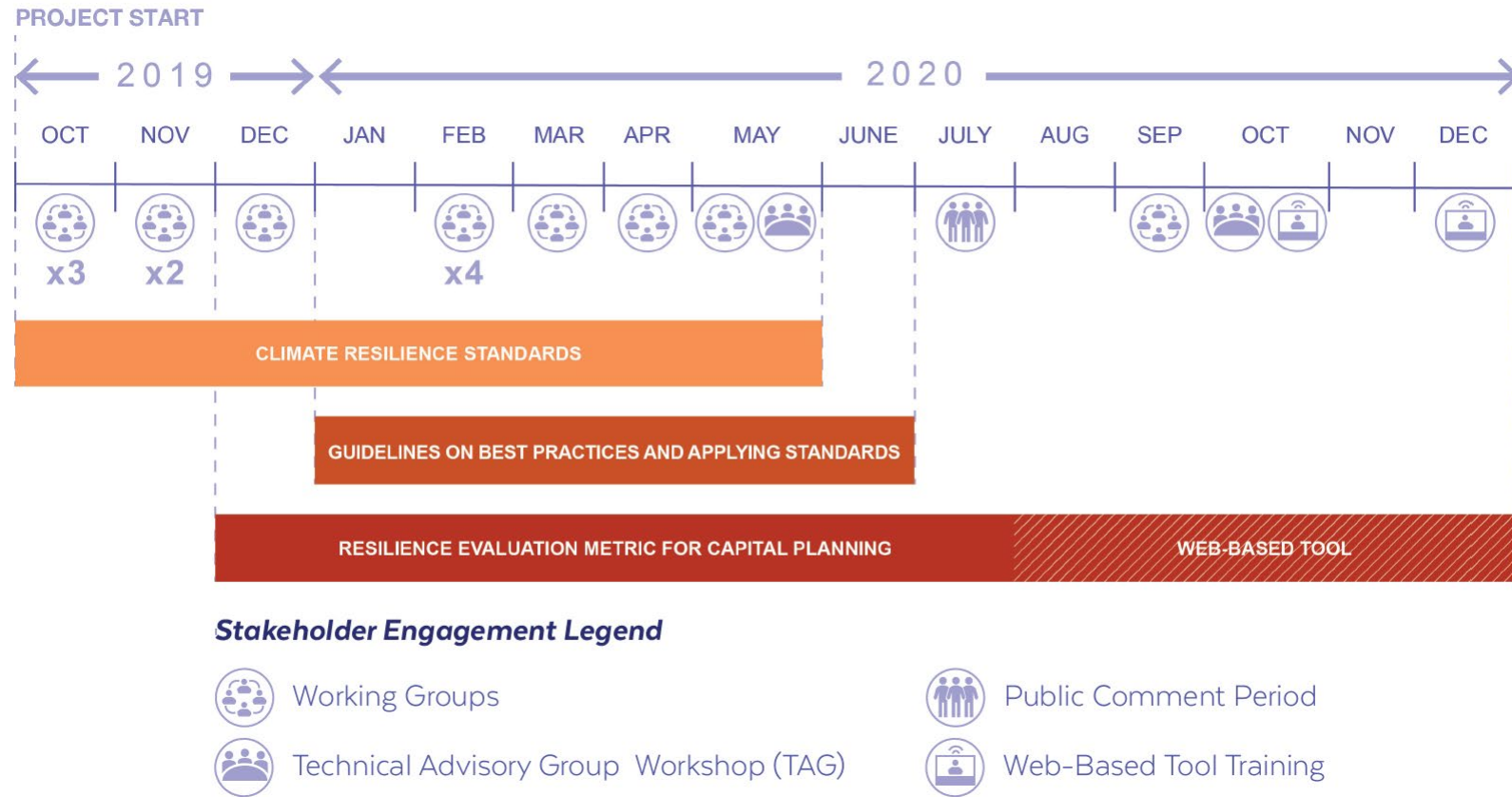
# RMAT Responsibilities

- Conduct quarterly meetings, annual plan reviews, post-disaster reviews & 5-year plan review & updates
- Track & facilitate completion of annual implementation updates for hazard mitigation & climate adaptation actions
- Ensure plan incorporates new data as they become available
- Provide outreach, technical assistance, stakeholder engagement & other educational services
- Coordinate collaborative partnerships & active engagement of key stakeholders
- Support incorporation of plan into other state plans & programs

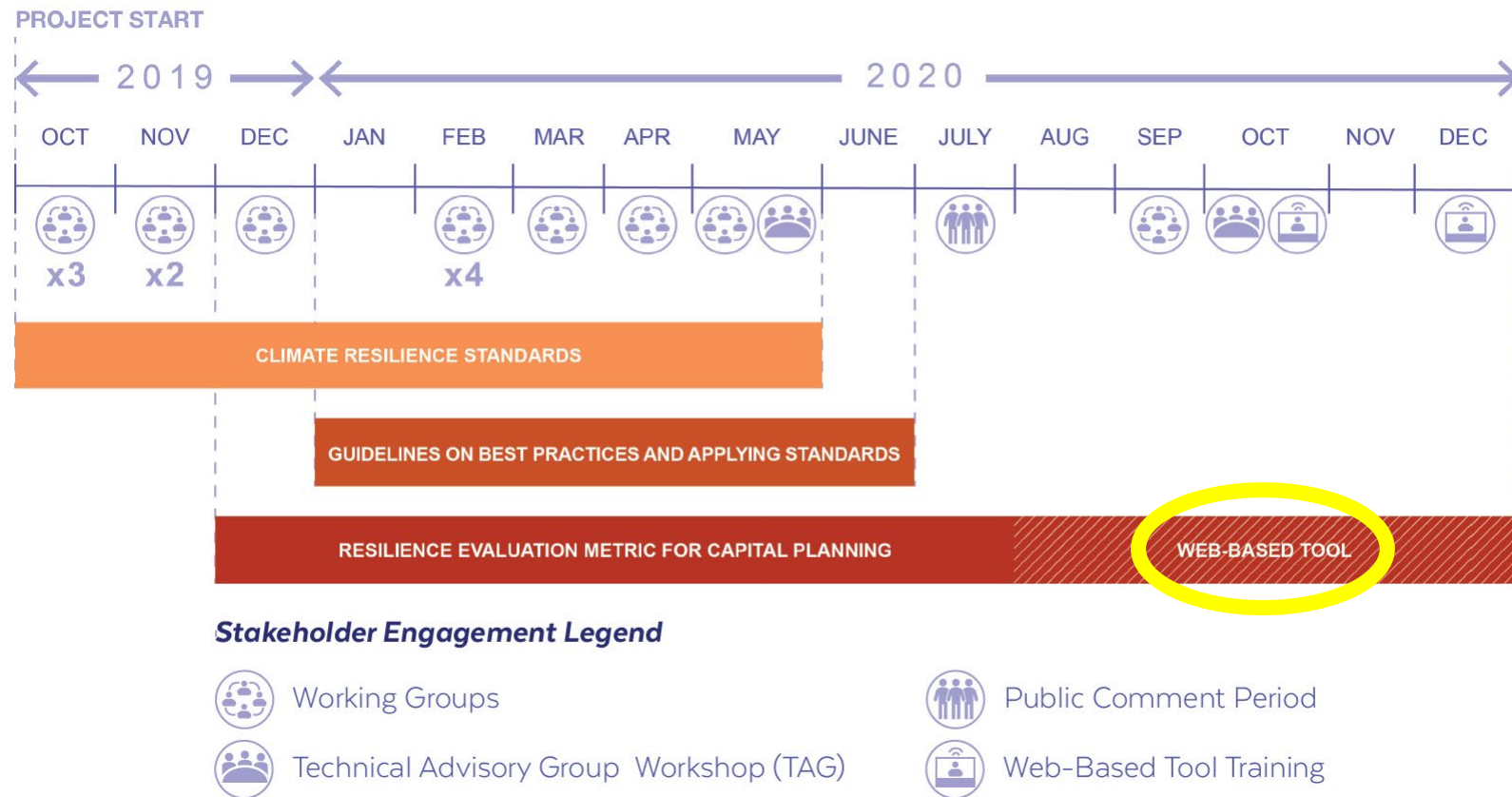
# RMAT Project: Climate resilience design standards & guidelines

- Consistent standards for using climate projection data in design of State projects with physical assets
- Guidelines with best practices for implementing climate resilience design standards
- Web-tool for agencies that provides a climate risk output (based on exposure & criticality)





# Project Timeline



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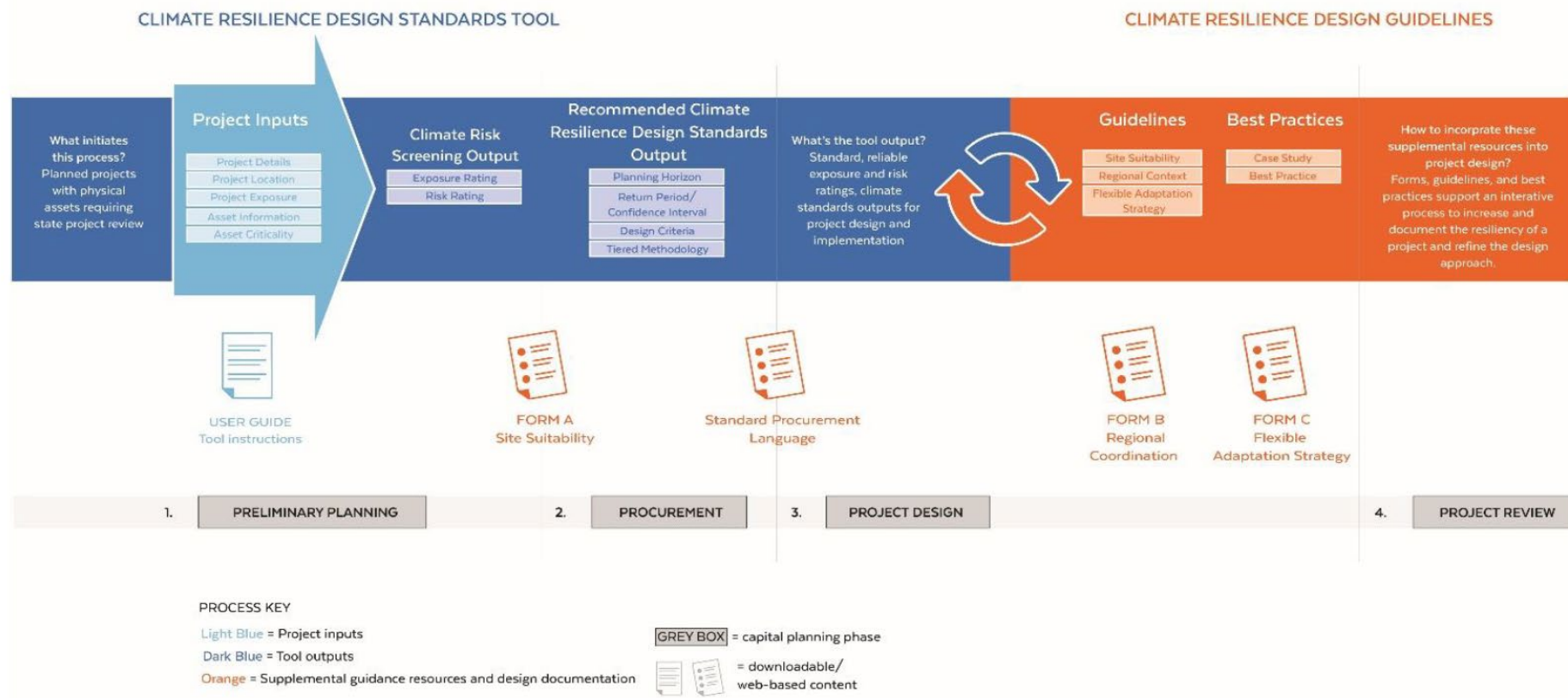
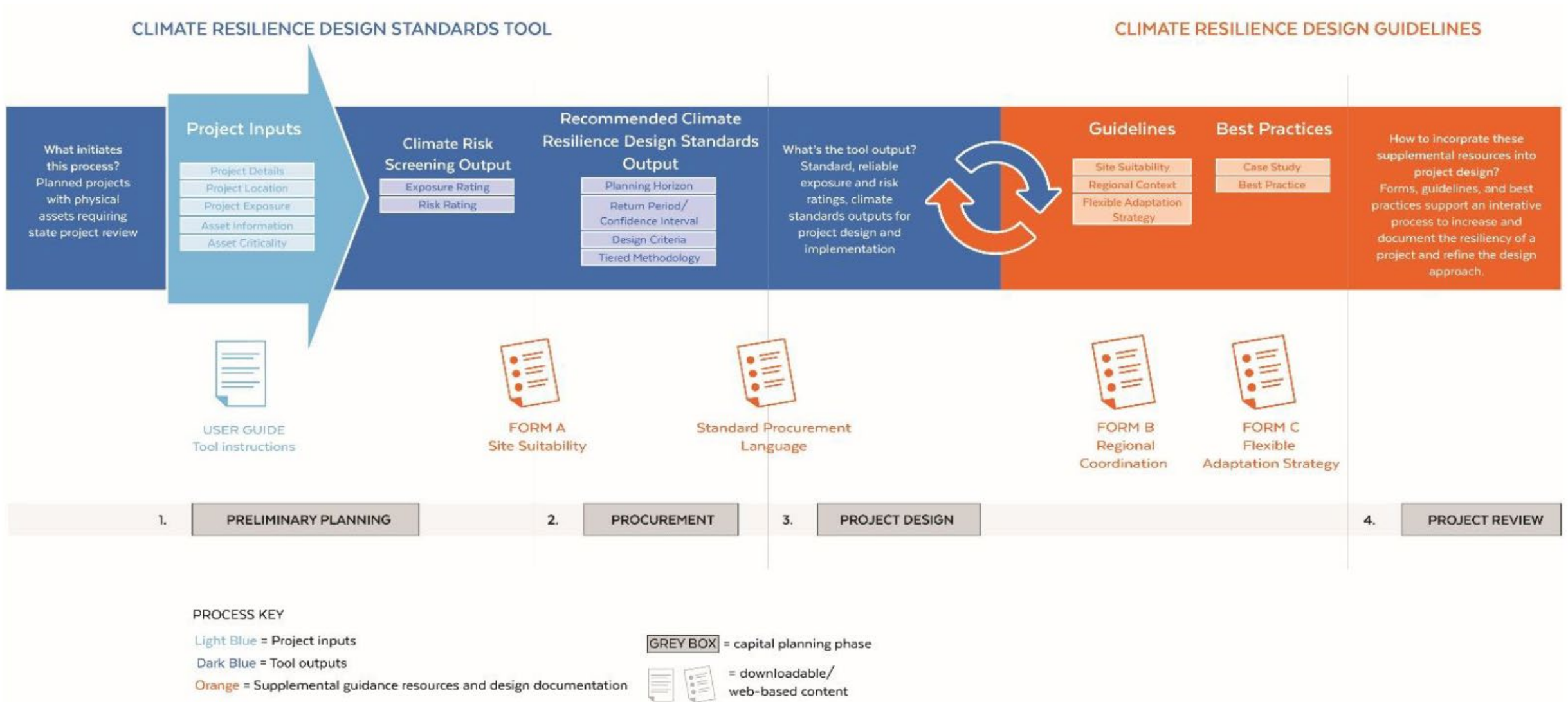


Figure 1. Draft Project Overview Showing the Project Inputs and Outputs for the Climate Resilience Design Standards Tool (in blue) and Supplemental Resources for the Climate Resilience Design Guidelines (in orange)

# Project Process

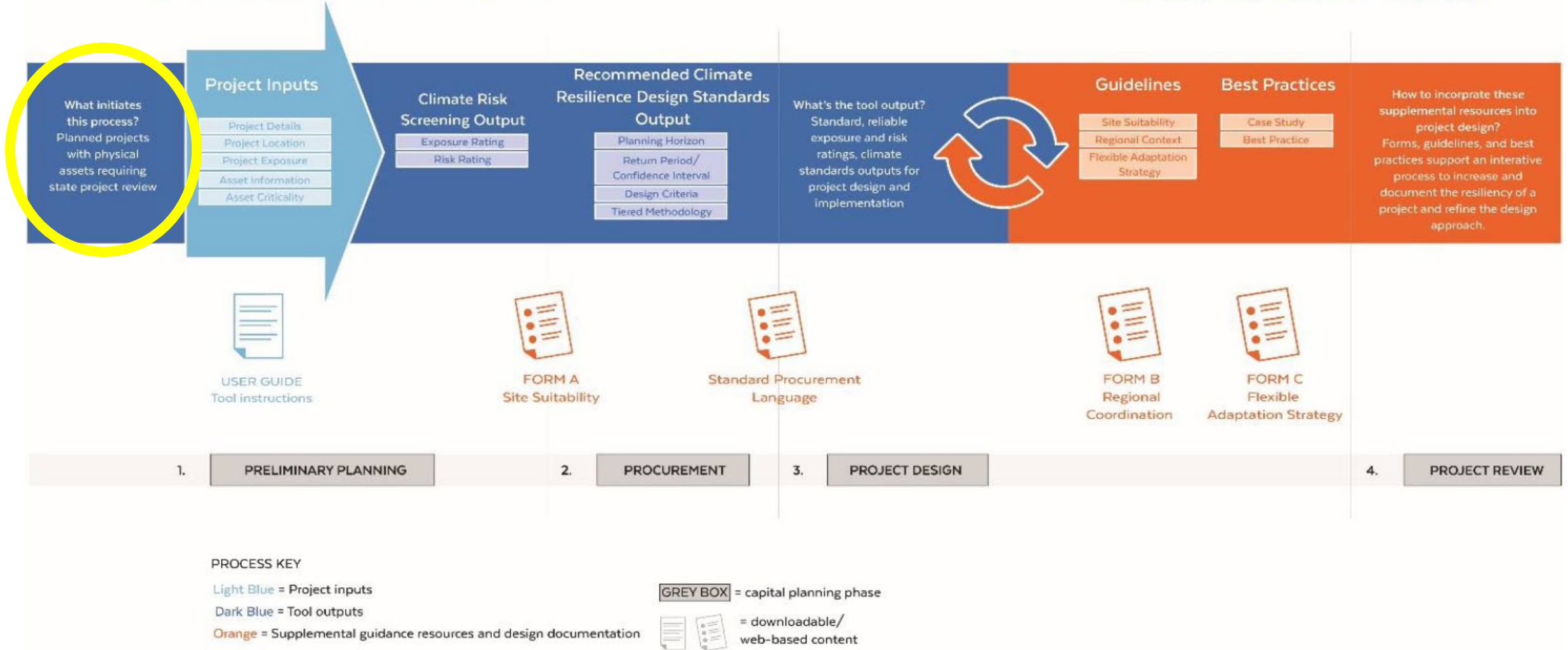




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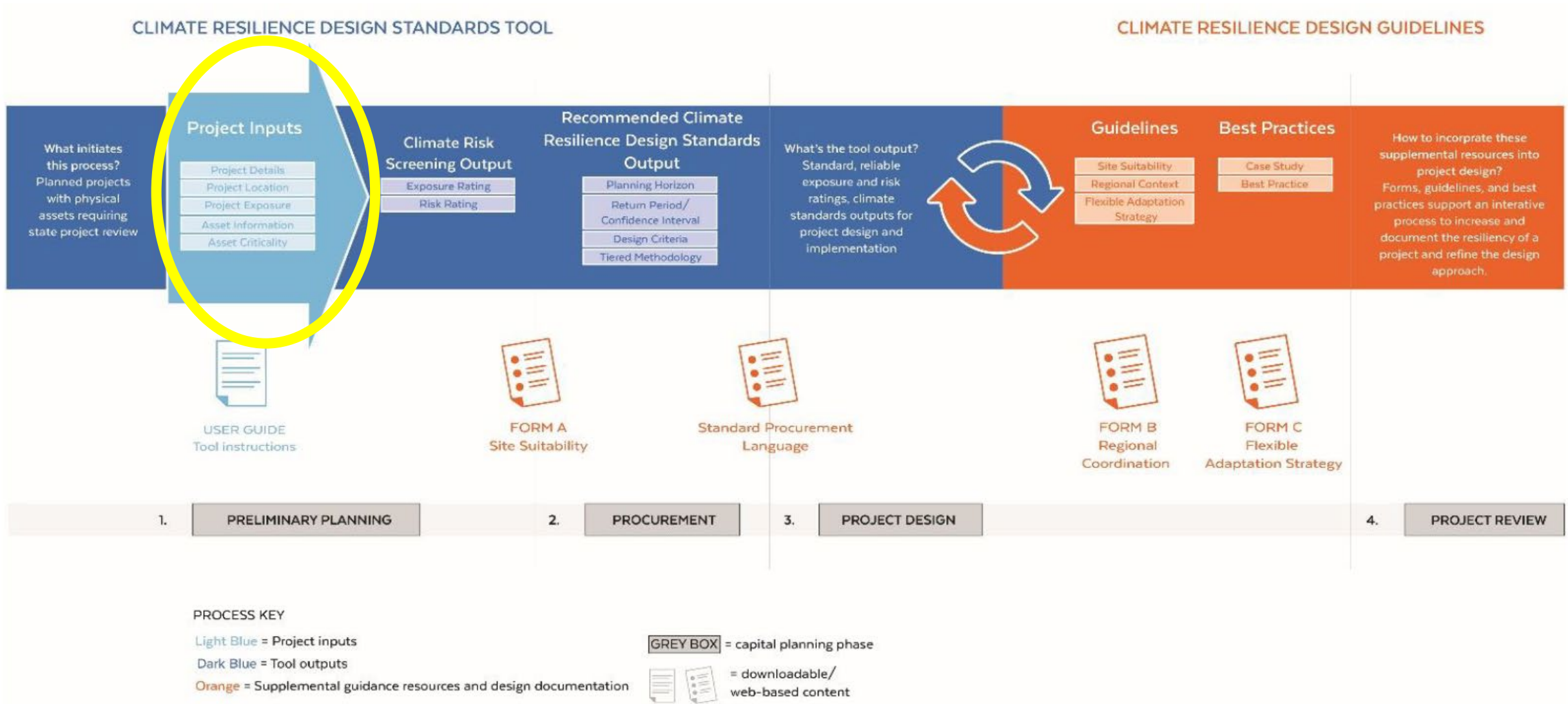
## CLIMATE RESILIENCE DESIGN STANDARDS TOOL

## CLIMATE RESILIENCE DESIGN GUIDELINES

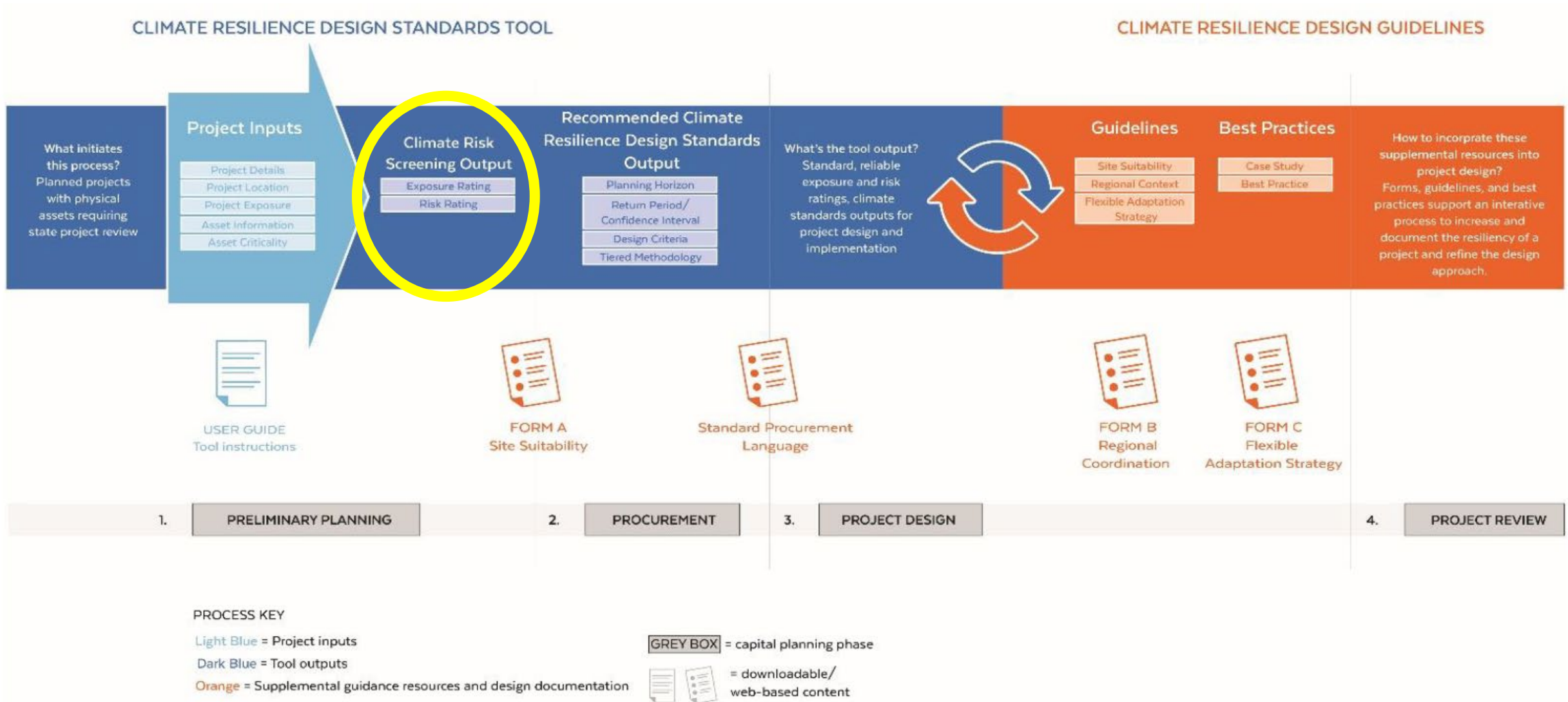


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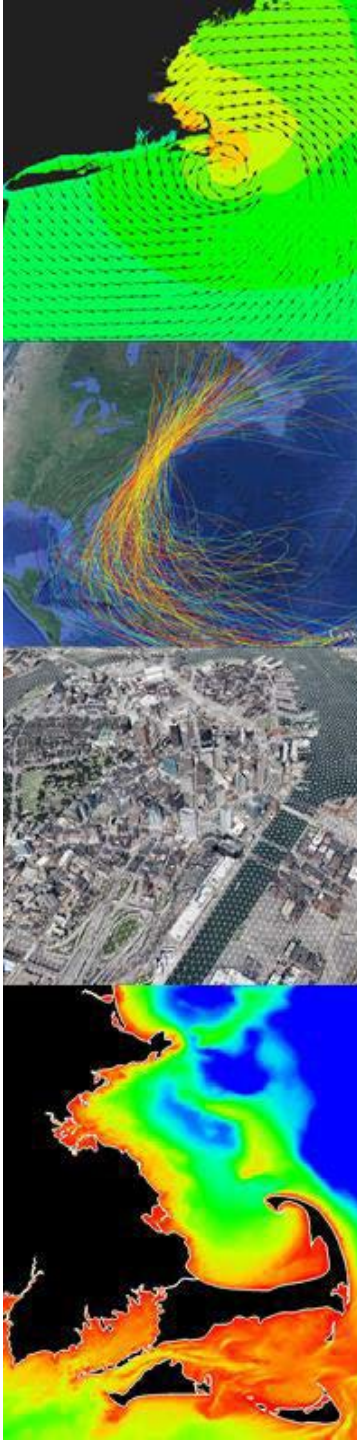




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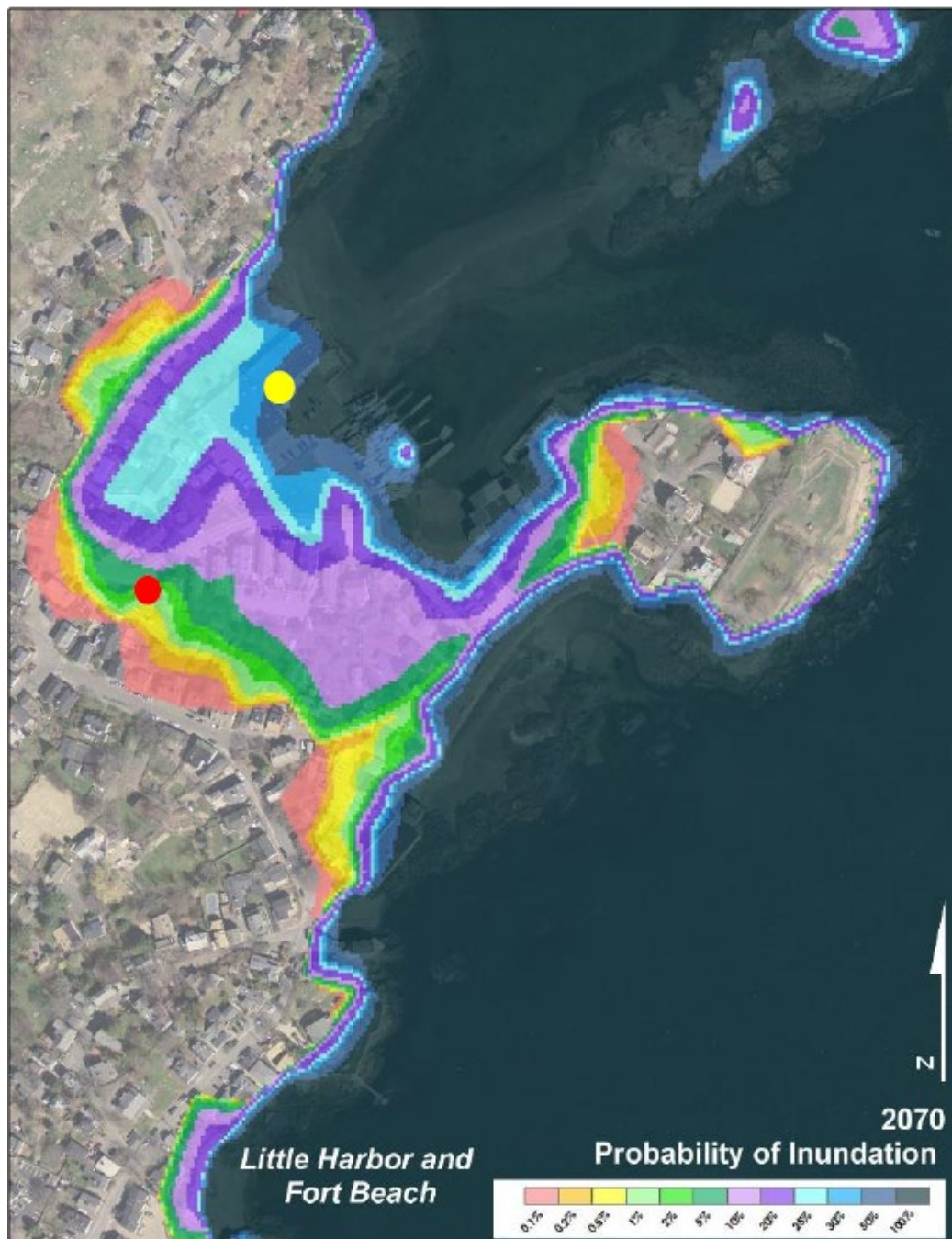
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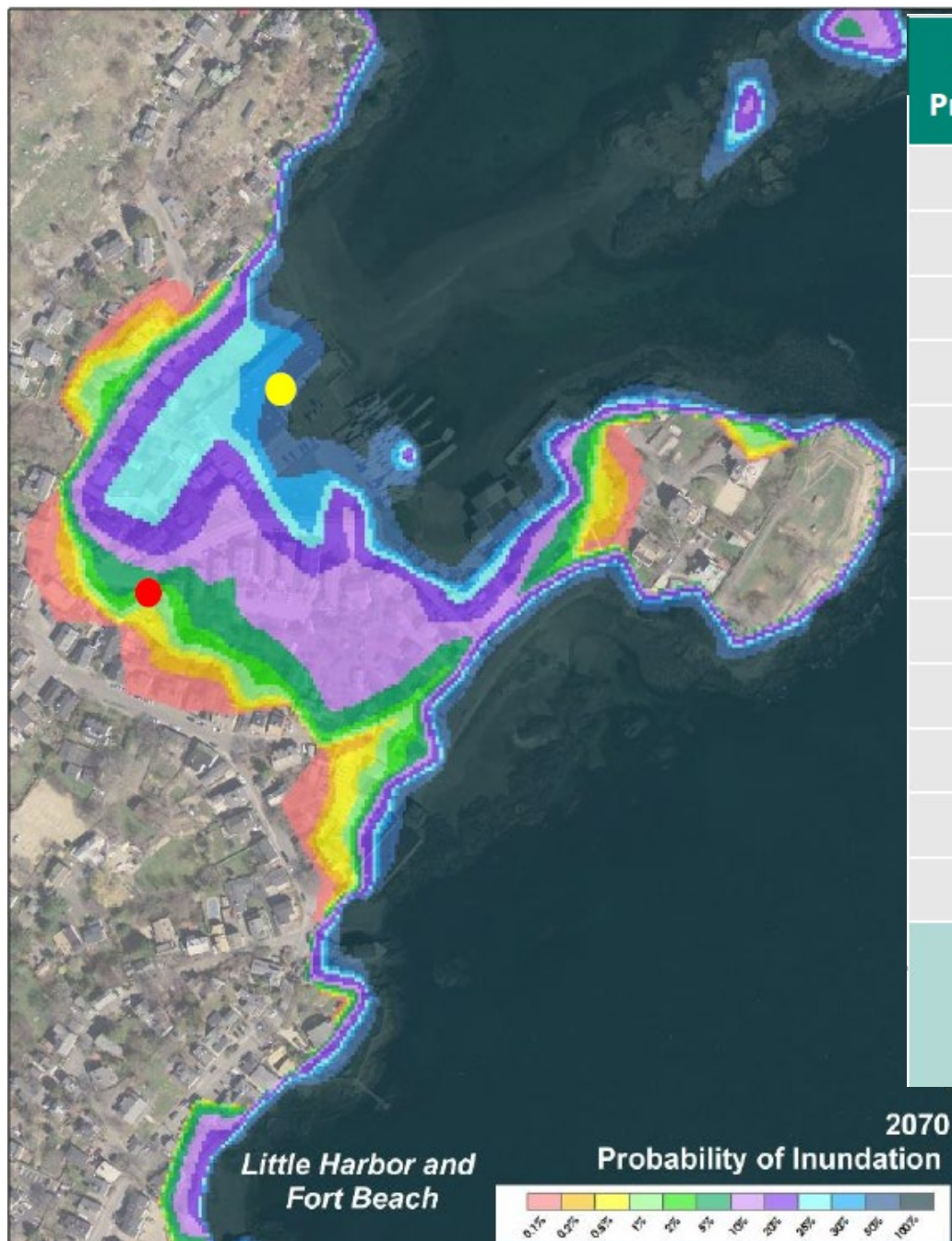


# Massachusetts Coast Flood Risk Model









Annual Probability	Return Period (yrs)	Cumulative Probability ( $P_e$ ) of 1 or more events occurring in:			
		10-yr period	25-yr period	50-yr period	100-yr period
100%	1	100%	100%	100%	100%
50%	2	99.9%	100%	100%	100%
30%	3.33	97.2%	100%	100%	100%
25%	4	94.4%	99.9%	100%	100%
20%	5	89.3%	99.6%	100%	100%
10%	10	65.1%	92.8%	99.5%	100%
5%	20	40.1%	72.3%	92.3%	99.4%
2%	50	18.3%	39.7%	63.6%	86.7%
1%	100	9.6%	22.2%	39.5%	63.4%
0.5%	200	4.9%	11.8%	22.2%	39.4%
0.2%	500	2.0%	4.9%	9.5%	18.1%
0.1%	1000	1.0%	2.5%	4.9%	9.5%

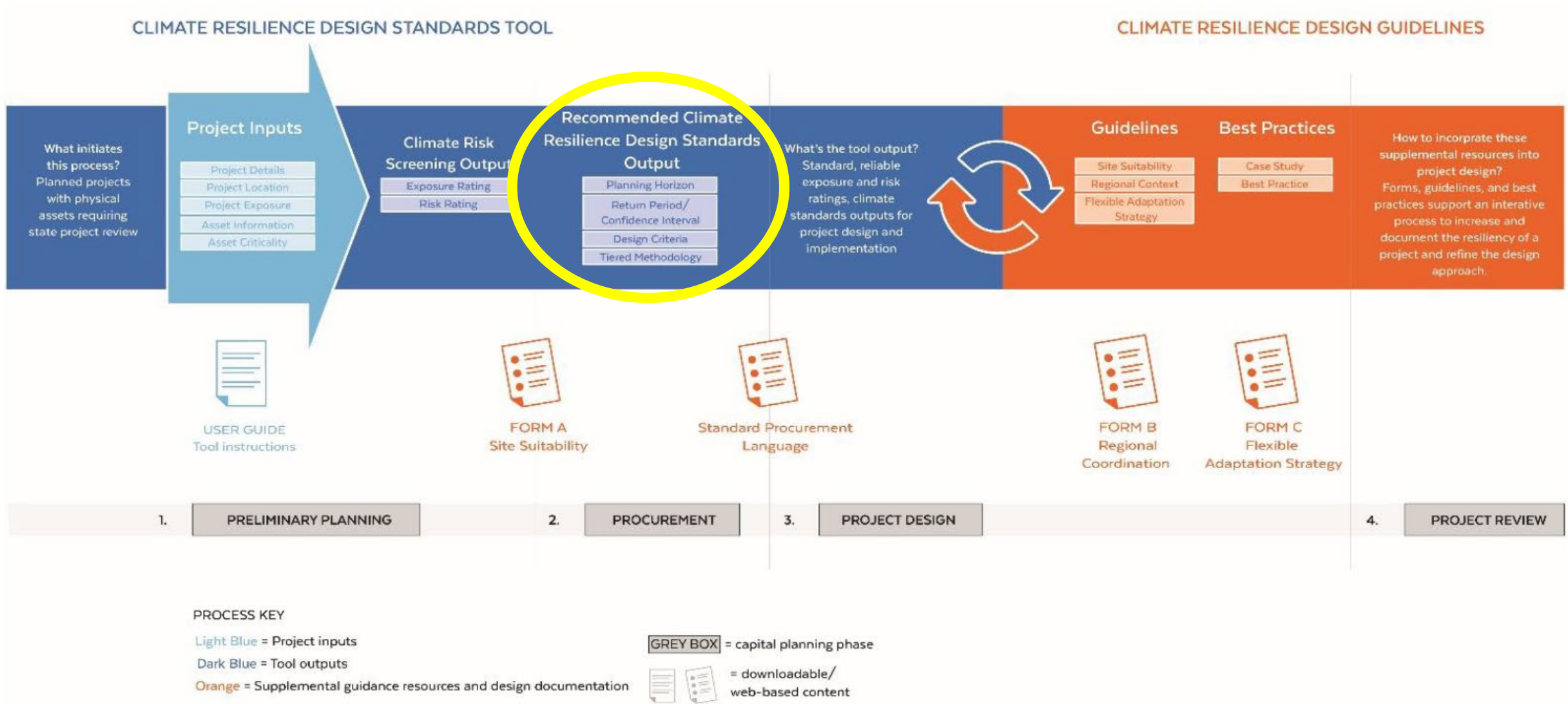
$$P_e = 1 - \left[1 - \frac{1}{T}\right]^n$$

where:

$T$  = return period

$n$  = # years in period

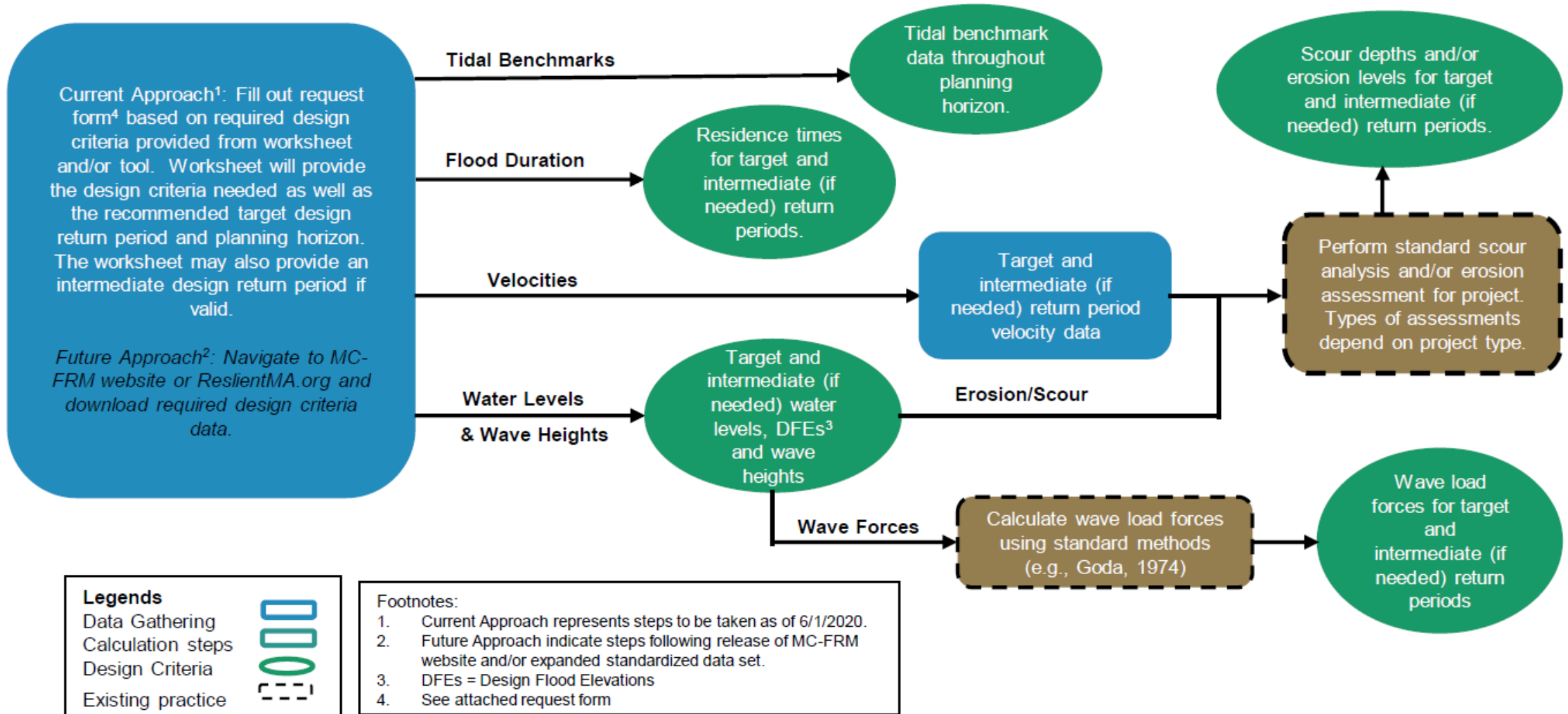


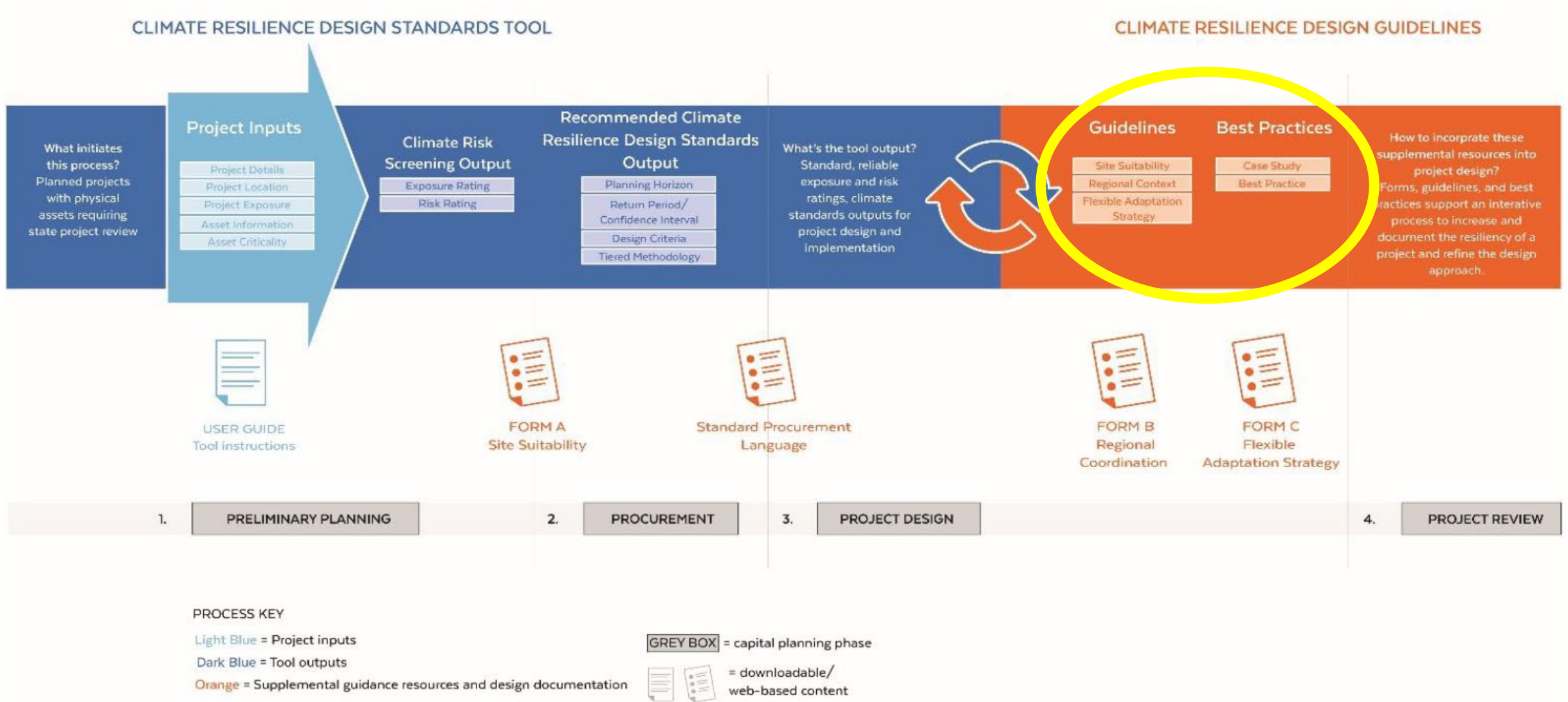


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# RMAT SOP to Assess Coastal Design Criteria

Given Standards Output from Tool: Planning Horizon (2030, 2050, 2070, 2100); Recurrence Interval (20-yr, 50-yr, 100-yr, 200-yr, 500-yr, 1000-yr)





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[www.mass.gov/info-details/resilient-ma-action-team-rmat](http://www.mass.gov/info-details/resilient-ma-action-team-rmat)