

Step 4: Implementation

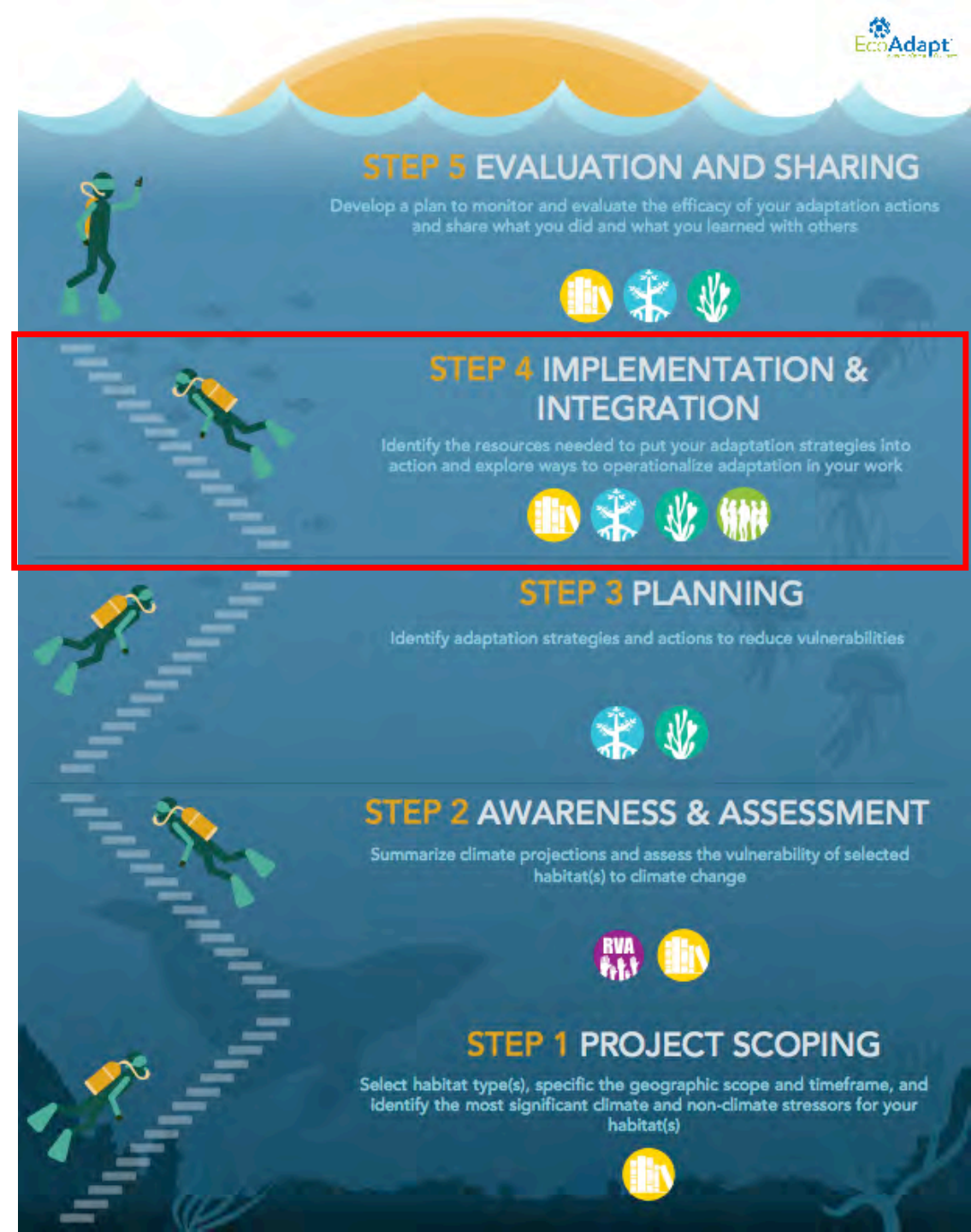
Implementation of adaptation options, whether its new regulations, processes, actions, or adjusting existing management activities.



Step 4: Implementation

Learning Objectives

- Understand how to move from planning to action – you know what needs to be done, so how do you do it?
- Explore how to leverage case studies, planning documents, and experts to implement your desired actions.



Implementation: why haven't we seen more?

**Field is in its
“infancy”**



**There are real (and
perceived) obstacles**



Implementation: strategies for success

- ✓ Identify thresholds to trigger specific actions using “leading indicators”
- ✓ Create a timeline of actions to implement
- ✓ Find partners to share the work and the costs
- ✓ Identify obstacles ahead of time and strategies how to overcome them
- ✓ Integrate climate adaptation extensively throughout existing management practices and processes (mainstreaming adaptation!)

Implementation using “leading indicators”



Action that may be triggered:
breaching of lagoon mouth

Indicator: water quality hits a
certain threshold (nutrients,
temperature)

Leading indicators:

*information collected prior to a
management decision that is meant
to trigger a specific action*

Implementation using time-defined actions

Adaptation Strategy: Restore estuarine habitat vulnerable to sea level rise



Relocate Sediment
Green Infrastructure

Living Shorelines
Modify Coastal Armoring

Road Removal/Redesign

2015

2020

2025

2030

2035

2040

2045

2050

2100

Example only. Not based on specific output of GFNMS work.

Implementation using partners

- will depend on the actions needed to implement the adaptation strategy
- will depend on who may be affected by the strategy or have an affect on the strategy (the “players”)
- may change over time as actions change
- may change over time as threshold are triggered and what we choose to do changes

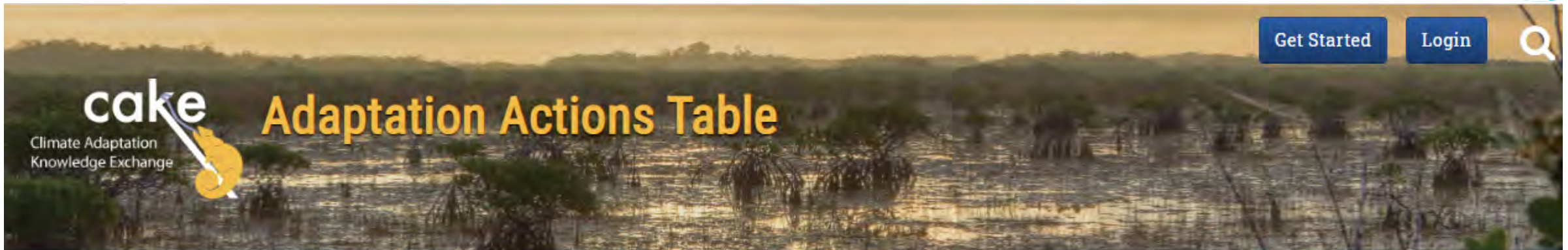


Obstacles to implementation



Explicitly documenting what you need for implementation, identifying where potential barriers may arise, and identifying strategies for overcoming those barriers can help you to overcome obstacles

Implementation: MPA Toolkit



Overview	About	Using the Toolkit	Tools ▾	Experts
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- [Adaptation Actions Table](#)
- [Adaptation Actions Search](#)
- [Foundational Resources](#)
- [Rapid Vulnerability Assessment](#)



Adaptation Actions Table

In the table below, information is organized by habitats/locations and potential climate stressors. The table lists actions/options with supporting case studies, tools and resources. You can browse the table or use the search function to find actions that can address specific climate stressors and impacts for a habitat or location. Terms are meant to align with and support the use of the North American Marine Protected Area Rapid Vulnerability Assessment Tool.

Letter codes in parentheses after entries indicate resource focus or stages in the Adaptation Ladder of Engagement.

Resource focus: Habitat/ecosystem (H), Species population (S), Infrastructure (I), Cultural (C), Policy (P), Other (O)

Adaptation Ladder of Engagement: 1.) Awareness (AW), 2.) Assessment (AS), 3.) Planning (PL), 4.) Implementation (IP), 5.) Integration (IT), 6.) Evaluation (EV), 7.) Sharing (SH)

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The screenshot shows the homepage of the CAKE Adaptation Actions Search tool. The header features the CAKE logo and the text "Climate Adaptation Knowledge Exchange" on the left, and "Get Started" and "Login" buttons on the right. The main navigation bar includes "Overview", "About", "Using the Toolkit", "Tools", and "Experts". The "Tools" dropdown menu is open, showing options for "Adaptation Actions Table", "Adaptation Actions Search", "Foundational Resources", and "Rapid Vulnerability Assessment Tool". Below the navigation is a search bar with an "Apply" button. The main content area displays three search results cards: a document about marine climate change refugia, a case study on coral adaptations in American Samoa, and a manual for coastal Alaskans. On the right side, there are filters for "Source Type" (Document: 108, Case Study: 24) and "Scale of Project" (Community / Local: 24, National / Federal: 22, Regional / Subnational: 1).

Implementation: MPA Toolkit



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Foundational Resources

The Toolkit provides a wealth of documents, case studies, guides and tools to inform your adaptation work, which can be overwhelming when starting out. Here are resources the project team considers great starting places. These resources are also foundational to every step of the Adaptation Ladder of Engagement. The list is curated and does not necessarily represent the full portfolio of what is available. It is a list of foundational resources upon which to build your adaptation work or provide a more comprehensive, high-level view of adaptation from start to finish.

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Management/Policy/Legal/Planning		
Lauren Wenzel <i>Acting Chief Policy and Planning Division</i> lauren.wenzel@noaa.gov Languages: EN	Office of National Marine Sanctuaries, NOAA Silver Springs, Maryland USA Regional Focus: USA	Can assist with legal & policy planning, analysis and development, strategic communications, and stakeholder engagement. Support Availability: Limited; Internal

Step 5: Monitoring & Evaluation

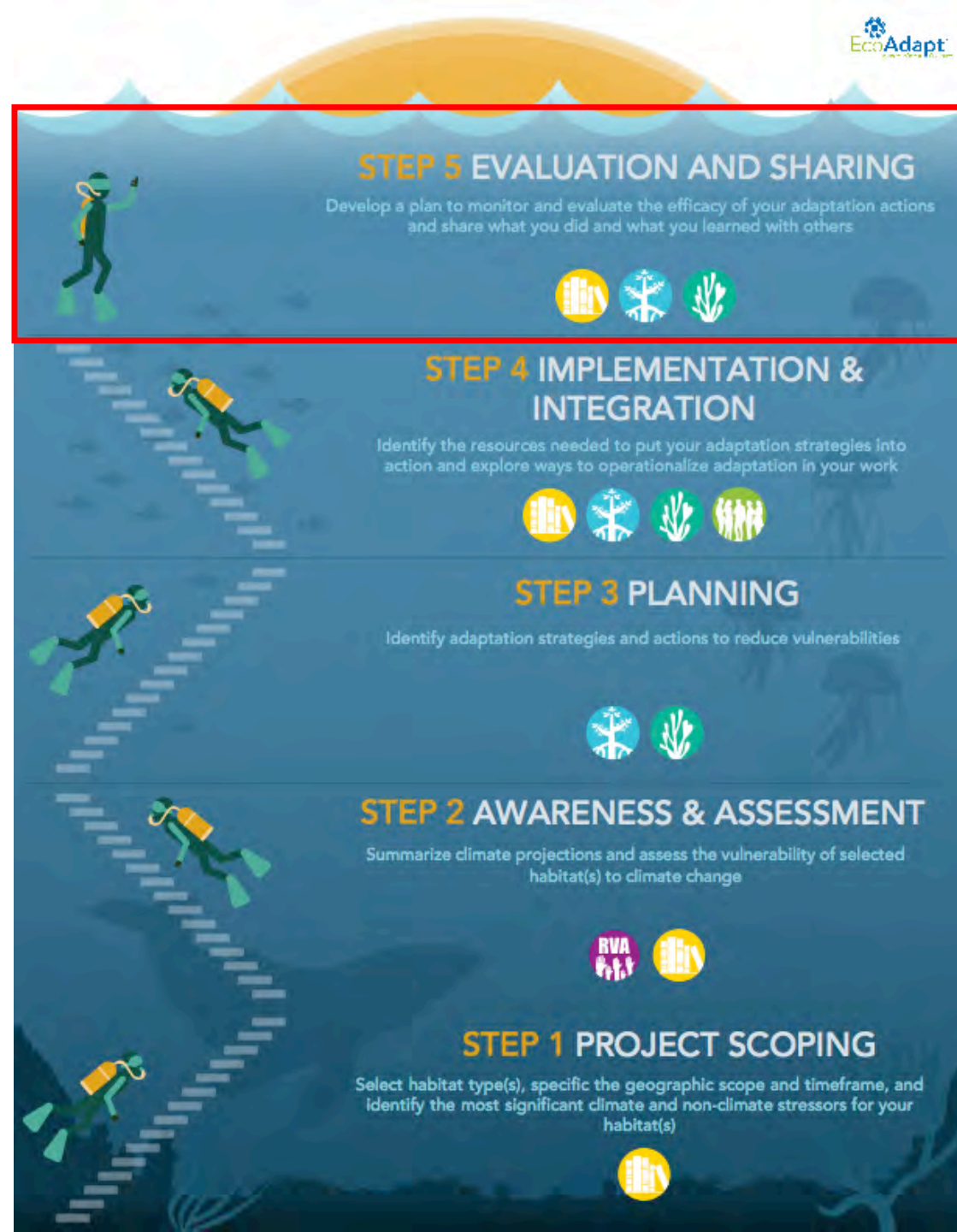
Monitoring and evaluating your adaptation actions to determine what is/is not working



Step 5: Monitoring & Evaluation

Learning Objectives

- Understand how to develop a plan to monitor and evaluate the efficacy of your actions
- Explore strategies for successful monitoring and evaluation efforts.





Monitoring & Evaluation

Climate changes

Tracking changes in climate stressors (e.g., pH, salinity)

Climate impacts

Documenting the condition of and tracking changes in marine and coastal resources (e.g., reduced abundance, range shifts)

Adaptation actions

Tracking and evaluating whether your adaptation actions are having their intended effect (e.g., reduced vulnerability, desired outcomes or goals met)



Monitoring & Evaluation

Table 11.1. Steps for designing and implementing climate change adaptation monitoring. Most projects will be concurrently engaged in several steps during the design and implementation phases.

Steps in Monitoring Design	Outcome or Information Gained
1. Articulate goals and objectives	Focus; define what's in or out of scope; identify "why" and "for whom"
2. Compile and assess existing information	Opportunities to use existing data and partnerships; identify gaps in existing programs; identify known trends or issues
3. Conceptual models and interactions	Identify known relationships and uncertainties in understanding and/or data gaps; identify key drivers, stressors, and responses; develop communication aids
4. Identify, prioritize, and select indicators (targets)	Identify high-ranked indicators; needs for research or monitoring; select list of indicators for further development
5. Sampling design and methods	Establish efficient, defensible, and repeatable monitoring design and protocols
6. Data management, analysis, and reporting	Create process to ensure efficient data quality, availability, and relevance; create outputs designed to increase likelihood that data will be used to inform the right decisions at the right time

Monitoring & Evaluation



Exercise 5. Monitoring & Evaluation

Habitat:

A. Strategy	B. Desired outcome(s) (once implemented, what should your strategy achieve?)	C. Monitoring parameter & method	D. Red flag indicator (identify a threshold that indicates the strategy is diverging from the desired outcome)
Identify and protect refugia	50-70% of identified refugia protected by 2030	Biodiversity (e.g. species richness) using transects	Biodiversity declining by XX% within refugia

Monitoring & Evaluation: why haven't we seen more?

Just like Implementation:

**Field is in
its “infancy”**



**There are real (and
perceived) obstacles**



Monitoring & Evaluation: strategies for success

- ✓ RESULTS: Identify indicators and track periodic targets along the way to meeting a desired outcome
- ✓ FLEXIBILITY: Be adaptive and willing to change focus
- ✓ INTEGRATION: Find ways to use existing MPA monitoring efforts
- ✓ LEARNING: Share information and experiences with stakeholders and partners

Monitoring & Evaluation: strategies for success

- ✓ RESULTS: Identify indicators and track periodic targets along the way to meeting a desired outcome

Desired outcome: Reduce urban heat island effect (provide shading and cooling)

Indicators: # of trees planted, degree change in land surface temperature



Monitoring & Evaluation: strategies for success

✓ **FLEXIBILITY:** Be adaptive and willing to change focus

If your actions are not having their intended effect, what will you do differently?

Desired Outcome	Red Flag Indicator	Potential Actions
Tidal marsh vegetation is on trajectory toward reference marsh condition	Vegetation deviates significantly (30-50%) from trajectory after colonization elevations are achieved	<ul style="list-style-type: none">• Active revegetation• Increased invasive species control• Study causes of slow vegetation establishment• Review sediment dynamics

Monitoring & Evaluation: strategies for success

- ✓ **INTEGRATION:** Find ways to use existing MPA monitoring efforts to tell you something about climate

What are you currently monitoring and what can it tell you about climate change?



Monitoring Indicator	What Can it Tell You About Climate Change?
Sediment delivery (i.e. meeting BMPs)	Increased sediment delivery could indicate an increase in the frequency of extreme precipitation events

Monitoring & Evaluation: strategies for success

- ✓ **INTEGRATION:** Find ways to use existing MPA monitoring efforts to build support for climate adaptation actions



Documenting what roads look like throughout the year: coastal flooding



Raising or relocating vulnerable roads while simultaneously restoring salt marsh

Monitoring & Evaluation: MPA Toolkit



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Show 10 entries

Search:

Habitats/Locations	Climate Stressors & Impacts	Actions/Options	Case Studies	Tools & Resources
Beach/Dune	<p>Stressors:</p> <ul style="list-style-type: none"> -Sea level rise -Storm severity/frequency -Wave action <p>Impacts:</p> <ul style="list-style-type: none"> -Increasing flooding -Erosion and shoreline change 	<p>Anticipate and facilitate inland/upland migration (e.g., buffers, setbacks, open space/conservation easements, land acquisition, remove/modify barriers)</p>	<p>Coastal Zone Management for SLR in Malibu, California: City's land-use implementation plan requires setbacks and other measures for all new development. (I) (IP)</p> <p>State and counties adopting shoreline setback rules due to SLR in Hawaii. (I) (IP)</p> <p>Responding to Climate Change in New York State: Suggestion of using rolling easements to move structures out of flood-prone areas. (I) (PL)</p>	<p>Adaptation Toolkit: Sea level rise and coastal land use: Explores 18 different land-use tools that can be used to preemptively respond to the threats posed by sea-level. (I)</p> <p>Case Studies of Natural Shoreline Infrastructure in Coastal California: Reviews natural infrastructure approaches to adapt to SLR in California using a series of case studies. (H,I)</p> <p>Puget Sound Feeder Bluffs: Coastal erosion as a sediment source and its implications for shoreline management (H,I)</p>

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Experts

The Experts List is a list of climate adaptation practitioners who can be contacted for questions or guidance. These are experts who have kindly offered a limited amount of free advice to support climate vulnerability assessments, adaptation planning and implementation work for marine and coastal protected areas. If listed, please first contact the experts listed within your agency or organization.