



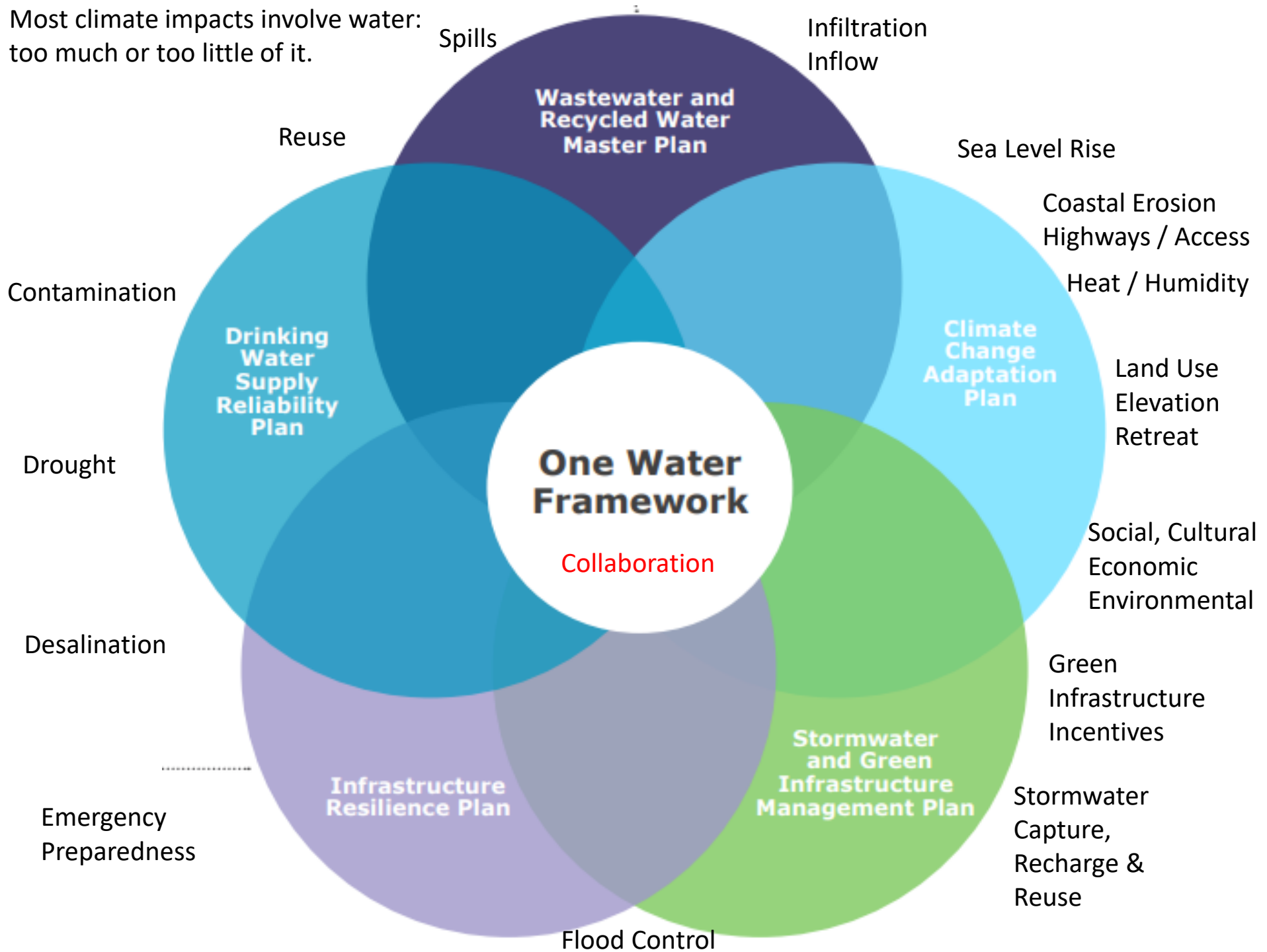
# ONE WATER FOR CLIMATE RESILIENCY

CITY & COUNTY OF HONOLULU



**WHY DO WE  
NEED ONE  
WATER?**

Most climate impacts involve water:  
too much or too little of it.





# WHAT IS ONE WATER

**‘ONE WATER’ – ONE WATER IS AN INTEGRATED PLANNING AND IMPLEMENTATION APPROACH TO MANAGING FINITE WATER RESOURCES FOR LONG-TERM RESILIENCE AND RELIABILITY, MEETING BOTH COMMUNITY AND ECOSYSTEM NEEDS. (WRF, 2017)**



*Ahupua'a - a section of mountain, valley, and sea.  
Image courtesy of Matt Foster published by Maui Nō Ka 'Ōi  
<https://mauimagazine.net/about-us/>.*

# HOW TO APPLY ONE WATER

1. START WITH EXISTING PLANS & PROGRAMS
2. LAYOUT CITY STRUCTURE, LOOK FOR INTEGRATION POINTS
3. FORMALIZE INTEGRATION POINTS/ COLLABORATIVE ACTIONS
4. ESTABLISH SCOPE OF WORK, WITH SHARED PRIORITIES & DEMO PROJECTS



# ACTION 1

## FORMALLY ESTABLISH A ONE WATER FRAMEWORK.

- ORDINANCE

### What is a **One Water** framework?

A One Water approach considers the water cycle as an integrated system, recognizing the interconnectedness of surface water and groundwater supply, stormwater, wastewater, and energy.<sup>2,3</sup> Many utilities have already developed plans associated with various elements captured in a One Water approach including drinking water supply reliability, climate change adaptation, stormwater management, green infrastructure, and wastewater infrastructure resilience.

A One Water framework builds on the interconnectedness of these plans and identifies efficiencies. The result of this effort may take the form of a separate comprehensive plan, but the end product can also be a framework, guiding the collaborative actions of a group of separate but connected entities; a document describing how to leverage existing plans; or a simple scope defining the prioritized water resource management initiatives. An outcome of the plan or framework can be the identification of projects with multiple benefits.



# ACTION 2

## DEVELOP INTERAGENCY MEMORANDUM OF UNDERSTANDINGS

- **PURPOSE: INTERAGENCY COLLABORATIVE AGREEMENT TO ADVANCE CLIMATE RESILIENCE**
- **INCLUDES: COMMON 'ONE WATER' OBJECTIVES & PRIORITIES**
- **MUTUALLY BENEFICIAL 'ONE WATER' DEMONSTRATION PROJECTS**
- **COOPERATIVE FUNDING, AS AVAILABLE**



# **ACTION 3**

## **ESTABLISH A ONE WATER PANEL.**

- **CONSULT ON CITY PROJECT & PROGRAMS**
- **COORDINATE PRIVATE DEVELOPMENT MASTER PLANS**
- **UPDATING BUILDING CODES & DESIGN STANDARDS**
- **AUTHORIZED AT DEPARTMENT HEAD LEVEL**
- **PARTICIPANTS FROM DIVISION HEAD LEVEL**



# ACTION 4

## ESTABLISH A 'ONE WATER' COMPONENT IN BROADER PLANNING FRAMEWORK.

- AT FUNCTIONAL PLANNING LEVEL
- CONNECTING TO DP, SCP & WMPS



# Land Use Planning and Implementation System



# ACTION 5

COORDINATION ON CIP  
AND ANNUAL BUDGET FOR  
'ONE WATER RESILIENCE  
CHECKLIST'





# CHECKLIST FOR CLIMATE RESILIENCE

- **RESEARCH & MONITORING**
  - SLR Modeling and Groundwater Monitoring Well Network
- **POLICY & REGULATION**
  - Mayor's Directive; Land use plan policies; SLR and Flood Insurance Rate Maps, Inundation Areas, and Shoreline Setbacks with SLR
- **FINANCING**
  - Appropriations over time, FEMA for Repetitive Loss areas, Tax incentives, Improvement Districts, Fees
- **PLANNING & ENGINEERING FEASIBILITY STUDIES AND INFRASTRUCTURE PLANNING**
  - Infrastructure Vulnerability Assessments, SLR Priority Criteria, Adaptive Strategies, Drainage Master Plans, On-site Reuse, Elevate or Retreat Criteria, Post-Disaster Reconstruction Plans, Coastal Erosion Strategies
- **PUBLIC OUTREACH AND COMMUNICATION**
- **DESIGN**
  - High Priority Areas: Mapunapuna, Waikiki, Iwilei, Kakaako, Aiea Kai
- **CONSTRUCTION**
  - Lift all utilities concurrent with roads if possible
- **NUISANCE FLOODING TRIGGER BY MID-CENTURY AS STREETS BECOME TRAFFIC HAZARDS**

# ACTION 6

## COORDINATING AND CONDITIONING PRIVATE DEVELOPMENTS FOR CLIMATE RESILIENCE AROUND CAPACITY & ADAPTATION

- PROJECT OPEN HOUSE FOR DEVELOPERS TO COLLECTIVELY MEET WITH 'ONE WATER DEPARTMENTS'



# ACTION 7

## IDENTIFY AND IMPLEMENT 'ONE WATER' DEMONSTRATION PROJECTS

- MAPUNAPUNA SEA LEVEL RISE ADAPTATION
- UNIVERSITY AVENUE COMPLETE STREETS
- EWA WATER REUSE
- ALA WAI STORMWATER MANAGEMENT PLAN
- CESSPOOL CONVERSIONS
- WAIHEE LOI RESTORATION





# ONE WATER ACTIONS

1. ESTABLISH ONE WATER FRAMEWORK
2. DEVELOP INTERAGENCY MOU'S
3. ESTABLISH ONE WATER PANEL
4. INTEGRATE IN PLANNING
5. COORDINATE ON CIP (RESILIENCE CHECKLIST)
6. PRIVATE DEVELOPMENT CONDITIONS AND CO-MEETING WITH DEVELOPERS
7. DEMONSTRATION PROJECTS



# HAWAII LEADS?

- 2018 CLIMATE CHANGE DIRECTIVE
- FULL POLITICAL CONTROL OVER WATERSHEDS
- ONE WATER -> ADAPT TO CLIMATE, IMPROVE INFRASTRUCTURE RESILIENCE, PROTECT OUR RESOURCES

