

Rising Sea Levels: A Regional Approach



Commission Workshop

March 3, 2016

Agenda

- 1:30 Welcome and Introduction
- 1:35 Presentation and Q&A
- 2:15 Table Top Exercise
Local and Regional Vulnerabilities and Actions
- 3:00 Table Top Discussion
Action Implementation Discussion
- 3:45 Report Back and Group Discussion
- 4:15 Wrap up and next steps

Workshop Series

- BCDC's 2016 Workshop Series on Rising Sea Levels:
 - First Workshop, January 2016: Five Year Review of BCDC's Climate Policies
 - Second Workshop, March 2016: The Regional Role and Approach
 - Third Workshop, April 2016: Review and discussion of January and March Findings
 - Fourth Workshop, May 2016: A Commissioner Conversation about Next Steps and Direction

Today's Workshop

At this workshop we will:

- Share the primary themes we heard during the first workshop
- Present the Commission's current framework for addressing rising sea level at the regional scale
- And together discuss how the region in general, and BCDC in particular, could support and encourage adaptation at the local and regional scales

First Workshop: Climate Policies 1-5

The discussion resulted in four primary themes:

- BCDC's jurisdiction and authority
- The project-by-project approach that is a result of applying the current climate change policies
- The balance of risk, innovation and adaptive management
- The regional approach to resilience

First Workshop: What we heard

BCDC's Jurisdiction and Authority:

- Does the Commission have the policy authority to review a proposed project's impacts to adjacent land?
- Sea level rise is not coming to BCDC for a permit.
- If the Commission's jurisdiction and authority were expanded it could limit local control.
- It would be helpful to regulate outside of BCDC's current jurisdiction since things that happen upland also affect resilience.
- Current policies create barriers to restoration projects.
- The Commission needs to articulate/change its mission in light of sea level rise.

First Workshop: What we heard

Project-by-Project Review:

- If BCDC approves a project that is not resilient, who will bear the cost of protecting that project?
- The project-by-project approach and limited jurisdiction is a challenge, but changing it would be a hot button issue for local government. However, the idea that BCDC can address the public access but not the buildings or the land use and that there is no regional, coordinated approach to this is a big problem. Should BCDC have the authority to step into new areas, such as land use and design? If BCDC doesn't fill this role, who will? Local governments are resource constrained and can only address those issues within their jurisdiction and will find this very hard to do without regional guidance.

First Workshop: What we heard

The balance of risk, innovation and adaptive management:

- Should there be a distinction made regarding the types of uses and projects that are better or less equipped to handle risk? For example, a distinction between a parking lot and a senior care facility?
- What can BCDC require of a project proposal to ensure that adaptive management actions can be taken later? Currently, BCDC does not require that funds or land be set aside to ensure that adaptive management approaches can be taken.
- Create permits with adaptation in mind; build measures, monitoring, and approaches into the permit now.

First Workshop: What we heard



The regional role and approach in resilience:

- Continue to provide and improve guidance, leverage the ART Program.
- Concerned and skeptical that it will be possible to address this issue regionally with an informal arrangement and not through some regulation and requirements. Are there models for regional planning from other places? Are there other answers?
- A regional agency like BCDC providing input would empower local governments, organizations, and community advocates to influence the local approval process for projects and make it more likely that local projects would address current and future hazards.

BCDC's Current Regional Policies and Programs



- Climate Policies 6 & 7
- ART Program & ART Portfolio
- Bay Area Regional Collaborative Member Agency
- Resilience By Design Managing Partner
- CHARG Steering Committee
- Partnership with Association of Bay Area Government's Resilience Program
- Bay Area Transportation Climate Resilience
(Metropolitan Transportation Commission, Caltrans, Bay Area Rapid Transit and other transit providers)

Bay Plan Climate Policies 6 & 7

- Policy 6 states that federal, state, regional and local jurisdictions and the public should develop a regional strategy to adapt to climate change and rising sea level and the policy identifies the types of information that should be included in such a strategy
- Policy 7 states that until a regional strategy is developed, BCDC will review project proposals on an individual basis and determine each project's consistency with climate change policies 1-5 and all other policies in the Bay Plan

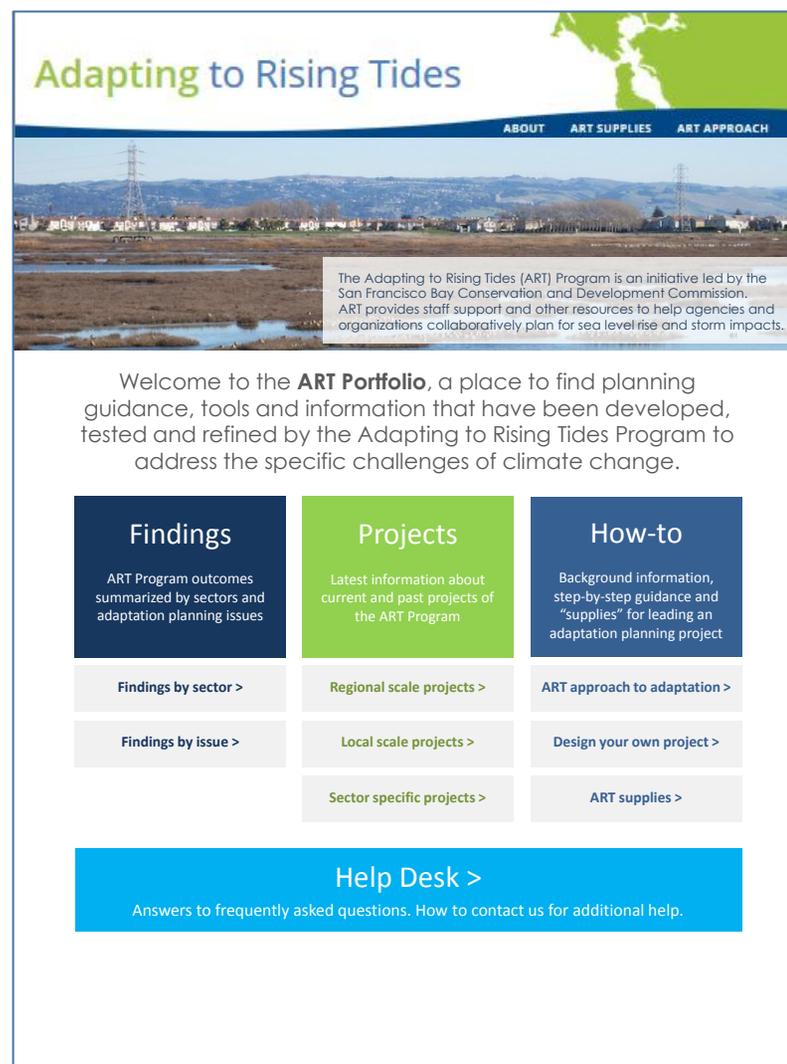
ART Program

- The Commission's Adapting to Rising Tides (ART) Program has been leading, assisting and providing guidance to adaptation planning efforts at all scales, including regional, local, sector and community
- The ART Program was created as a pilot in 2011 in partnership with the National Oceanic and Atmospheric Administration (NOAA) to assist with adaptation planning and was not intended to result in the regional strategy described by Climate Policy 6



ART Portfolio and Help Desk

- The ART Portfolio is a resource with data, tools, information, and findings to help understand and address the specific challenges of building resilience across different assets, jurisdictions and owners
- ART Help Desk is technical assistance for local jurisdictions, communities and agencies when they are assessing vulnerability and building resilience



BCDC Regional Partnerships and Roles

- Bay Area Regional Collaborative Member Agency
 - Staff team, Update to 2017 Sustainable Communities Strategy, logic model/process map, technical assistance
- Resilience By Design Managing Partner
 - Assisting with framing, research and identifying partners
- CHARG Steering Committee
 - Provide guidance and support to CHARG and its committees



BCDC Regional Partnerships and Roles

- Partnership with Association of Bay Area Government's Resilience Program
 - Safer Housing, Stronger Communities Project, Safe, Smart Growth with EPA and FEMA, guidance on hazard mitigation and climate adaptation
- Bay Area Transportation Climate Resilience (Metropolitan Transportation Commission, Caltrans, Bay Area Rapid Transit and other transit providers)
 - Transportation vulnerability assessments and adaptation approaches, regular and ongoing collaboration and support for transportation resilience to transportation and transit agencies





BCDC Regional Partnerships and Roles

- Regional research with San Francisco Estuary Institute
 - Head of Tide Project, regional shoreline delineation/shoreline features mapping, Flood Control 2.0
- Bay Area Ecosystems Climate Change Consortium
 - Steering committee member, assist in science assessments for Bay ecosystems climate vulnerability and a forum for understanding how resilience in natural systems builds regional resilience

Types of Regional Issues:

Networked Infrastructure

- Shoreline Protection
- Transportation
- Utilities



Regionally Significant Assets

- Airports and Seaports
- Refineries and Pipelines
- Baylands



Local Vulnerabilities = Regional Consequences

- Tidal Creeks and Channels
- Shoreline Protection

Communities with characteristics that place them at greater risk, e.g., low income, renters, transit dependent, elderly

Types of Regional Issues:

Governance Challenges

- Landowners and resource managers do not have the tools for shared decision making and financing
- Current plans, policies and regulations were not designed to address issues that cross jurisdictions and sectors or are non-stationary
- Addressing climate change requires all of us – public, private, community and non-profit – to be at the table from the start, from defining the problem to implementing the agreed upon solutions
- Governance challenges will make it impossible to solve some of the most critical regional issues, and will result in solutions that fail to balance the protection of the environment, economy and equity

Types of Regional Issues:

Information Gaps

- There are significant information and data gaps about networked and regionally significant infrastructure, and what is available is difficult to access
- Further study is needed to understand when and where the Bay will impact communities and infrastructure within and alongside river flood plains
- Subsurface infrastructure (pipelines, sewers, water lines) will be impacted by a rising water table and salinity intrusion, however there is no information on how rising sea levels will affect groundwater
- Readily available population and demographic information is not adequate for determining community vulnerability at either local or regional scales

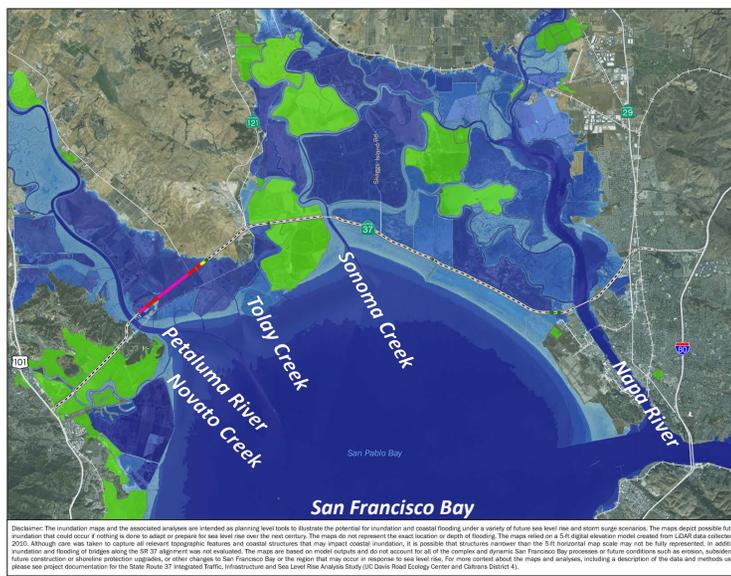
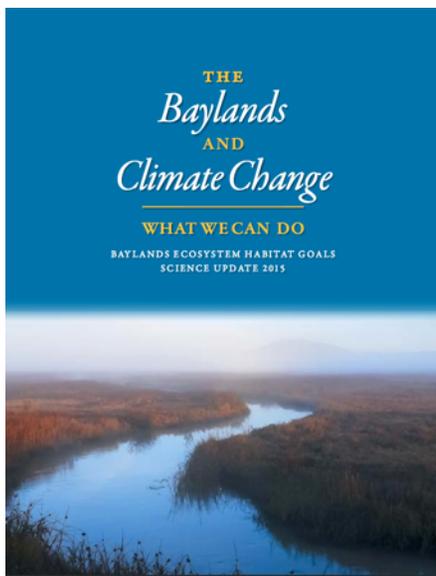
Types of Regional Actions

- Research and analysis
- Stakeholder and community engagement
- Data and information collection and sharing
- Vulnerability assessments
- Public education and outreach
- Physical strategies for adaptation
- Incentives
- Guidance and support
- Funding
- Regulations
- Plans and policies
- Institutional arrangements
- Collaborations
- Advocacy and influence

Regional Action Example

Research and Analysis

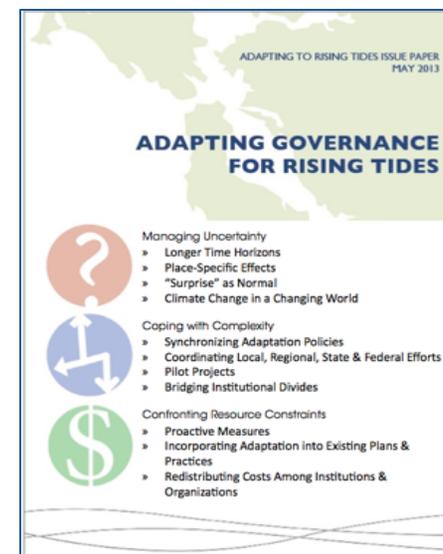
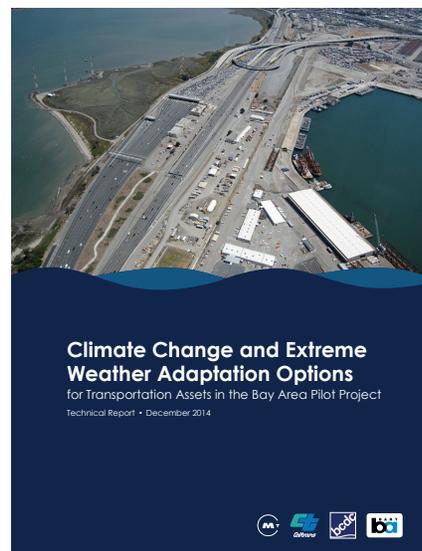
- One map, many futures (total water level approach)
- Head of Tide
- Corte Madera Baylands
- Baylands Ecosystem Habitat Goals Update



Regional Action Example

Vulnerability Assessments

- ART Alameda
- ART Contra Costa
- Safer Housing, Stronger Communities
- Silicon Valley 2.0
- Sea-Change San Mateo
- C-SMART Marin
- BayWave Marin



Regional Action Example

Public Education and Outreach

- Bay Area King Tides Photo Initiative
- ART Walk San Rafael
- Sharks in my Backyard
- OWLized
- Science centers, e.g., California Academy of Science, Exploratorium, Chabot Space and Science
- Interpretive centers
- Resilience by Design



Sea level rise for the Hayward Shoreline is projected to be as much as 55 inches by the year 2100! The SF Bay Estuary may be even closer to your backyard in the not-so-distant future. How will the impacts of sea level rise affect us? What will be our response? Join naturalists from the Hayward Shoreline Interpretive Center in this lively and interactive community discussion where representatives from the *Adapting to Rising Tides Project* present the most current information regarding local impacts of sea level rise, then discuss in small groups how we respond as a community!

Partners and partners include Hayward Area Recreation and Park Districts – Hayward Shoreline Interpretive Center, Bay Conservation and Development Commission – Adapting to Rising Tides Project, 350BayArea.org, American Association of University Women – Castro Valley, Castro Valley Library, Hayward Area Shoreline Planning Agency – Citizens Advisory Committee, MindSpring, Starr King Unitarian Universalist Church, Hayward – Social Justice Committee, and Women Environmental Artists Directory.



In conjunction with this program, *55" – Images of Sea Level Rise* is an exhibit from January 25 through April 13, 2014 at The Hayward Shoreline Interpretive Center at 4901 Breakwater Ave., Hayward, CA (Opening Reception with the Artists: Saturday, January 25 at 2pm). For more information, please contact HIC: (510) 670-7270; shelene@haywardrec.org; www.haywardrec.org



No reservations are required for this FREE event. Location is wheelchair accessible. An ASL interpreter will be provided for this program if requested at least 7 working days in advance. Voice 510-667-7900 / TTY 888-643-0660. www.aclibrary.org

Regional Action Example

Guidance and Support

- ART Portfolio
- Baylands Ecosystem Habitat Goals Update
- ABAG Resilience Program
- California Climate Adaptation Planning Guide

**ASSOCIATION OF BAY AREA GOVERNMENTS
RESILIENCE PROGRAM**

Hazards Projects Topics Data Publications About

Featured Projects

Stronger Housing, Safer Communities
An ABAG and BCDC report on vulnerability of housing and communities to earthquakes and flooding and strategies to address them.

Policy Implementation

Mitigation and Adaptation Plans
ABAG and BCDC are supporting jurisdictions to update and develop local hazard mitigation and climate adaptation plans.

Cascading Failures

Upcoming Events

In the News

M6.4 Taiwan Earthquake - The February 6th quake appears to have damaged buildings and infrastructure. The Bay Area has many strong ties to Taiwan and we offer our collective sympathy to the impacted communities. Damaging earthquakes reaffirm the Bay Area's commitment to ensuring safe housing, and resilient infrastructure across the region. Get more information about how to get prepared in our [Earthquake Portal](#).
Posted on 02/06/15

New Bay Area Policy Database - ABAG is developing a regional policy database to serve as a clearinghouse for innovative local policy, including resilience policies. The database will grow as we collect more policies. You can search by jurisdiction or policy type. Check out the [database](#) today if you have any policies you'd like to include.
Posted on 12/30/14

Floodwall for Bay Area Wastewater Treatment Plant - In October 2015 the Napa Sanitation and Flood Control District received notification of FEMA support for the district's new flood wall. The District applied for the funding as part of the Hazard Mitigation Grant program resulting from the 2014 South Napa earthquake. [read more](#)
Posted on 12/04/15

Are you storm ready? Last week's storm reminded the Bay Area that storm season is approaching, and forecasters are predicting a strong El Niño effect, which can lead to [frequent, hazardous, wind fires, and waves](#).

Adapting to Rising Tides

ABOUT US ART APPROACH NEWS

Adapting to Rising Tides > ART Supplies > ART Supplies

Findings

Projects

Regional
Local
Sector

How-To

ART Approach
Design Your Project
ART Supplies
Help Desk

ART Supplies
The guides, engagement exercises and other information referenced in How-To: Design Your Own Project.

To learn how these supplies are used in the ART approach to adaptation planning, visit the [Design Your Project](#) pages and download the guide (24 pages) which detail each step in the planning process.

Download the Design Your Project Guide

Good Planning Guides:
Provide a foundation for designing a project that utilizes robust stakeholder engagement and transparent decision-making.

[Stakeholder Engagement](#)
[Transparent Decision-Making](#)

How-To Guides:
Provide instructions and tools used by the project team.

[Communicating About Climate Impacts](#)
[The ART Assessment Questions](#)
[Selecting Climate Scenarios](#)
[Exposure Analysis](#)
[Vulnerability & Consequence Statements](#)
[Profile Sheets](#)
[Issue Statements](#)
[Key Planning Issues](#)
[Developing Adaptation Responses](#)

New [How-To Guide: Developing Evaluation Criteria](#)



Regional Action Example

Institutional Arrangements

- Bay Area Regional Collaborative
- Sonoma County Transportation and Regional Climate Protection Authority
- Hayward Area Shoreline Planning Agency
- Climate Readiness Institute (CRI)



Bay Area
**Regional
Collaborative**



ABAG
ASSOCIATION
OF BAY AREA
GOVERNMENTS

Collaborations

- SF Regional CHARG
- Alliance of Regional Collaboratives for Climate Adaptation (ARCCA)
- Safe, Smart Growth Partnership (ABAG, BCDC, EPA, FEMA, NOAA)
- Bay Area Ecosystems Climate Change Consortium (BAECCC)



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT



Other Regional Action Examples?

- Research and analysis
- **Stakeholder and community engagement**
- **Data and information collection and sharing**
- Vulnerability assessments
- Public education and outreach
- **Physical strategies for adaptation**
- **Incentives**
- Guidance and support
- **Funding**
- **Regulations**
- **Plans and policies**
- Institutional arrangements
- Collaborations
- **Advocacy and influence**

Example Regional Issue + Actions

Regional Issue:

Regionally significant transportation infrastructure is at risk from current and future flooding

Finding:

The Bay Bridge is at risk from today's 50 year storm



Figure 2. Shoreline Inundation Areas A, B, and C - MHHW + 36-inch Scenario

Regional Actions:

- ART Alameda County Vulnerability Assessment (Assessment)
- ART Mapping and Analysis (Research and Analysis)
- Bay Area Transportation Climate Resilience Project (Physical Strategies)

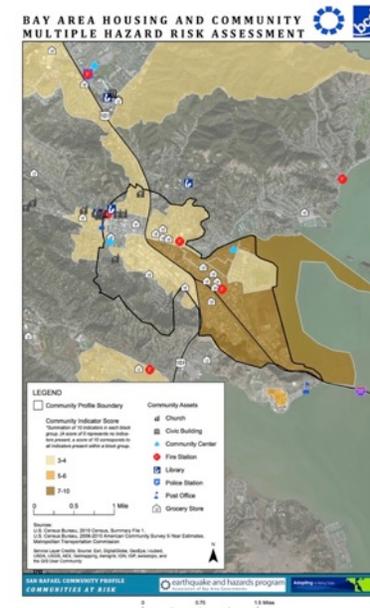
Example Regional Issue + Actions

Regional Issue:

Communities with characteristics that place them at greater risk, e.g., low income, renters, transit dependent, elderly

Finding:

There are a number of places in the region where communities at risk are living in areas with seismic and flood hazards in potentially fragile housing



Regional Actions:

- Safer Housing, Stronger Communities (Assessment, Research and Analysis, Guidance and Support)
- BARC (Institutional arrangement, Advocacy, Outreach)

Example: local vulnerability=regional consequences



Local Vulnerability:

In many locations around the Bay shoreline, regionally significant transportation infrastructure crosses local tidal creeks and channels

Regional Consequence:

I-880 in Oakland and the rail tracks in Contra Costa County at risk of flooding where they cross tidal creeks and channels, which would have widespread regional impacts on goods and commuters

Regional Actions:

- ART Oakland/Alameda Resilience Study (Assessment)
- ART Tidal Creeks and Channels (Research and Analysis)
- ART Up a Creek Report (Guidance)



Example: local vulnerability=regional consequences



Local Vulnerability:

In many locations around the bay shoreline, wetlands and marshes have little room to migrate and are adjacent to infrastructure and development.

Regional Consequence:

Without a coordinated, regional approach, the Bay Area may lose many of its marshes and the services they provide to sea level rise and climate change

Regional Actions:

- ART Vulnerability Assessments (Assessment)
- Bayland Ecosystem Goals Update (Research and Analysis)
- Point Blue San Francisco Bay Tidal Marshes (Guidance)



Table Top Exercise

Goal: Explore the local and regional vulnerabilities, consequences and actions of a conceptual landscape that is at risk from current and future shoreline and riverine flooding

This exercise is based on ART Program work around the Bay

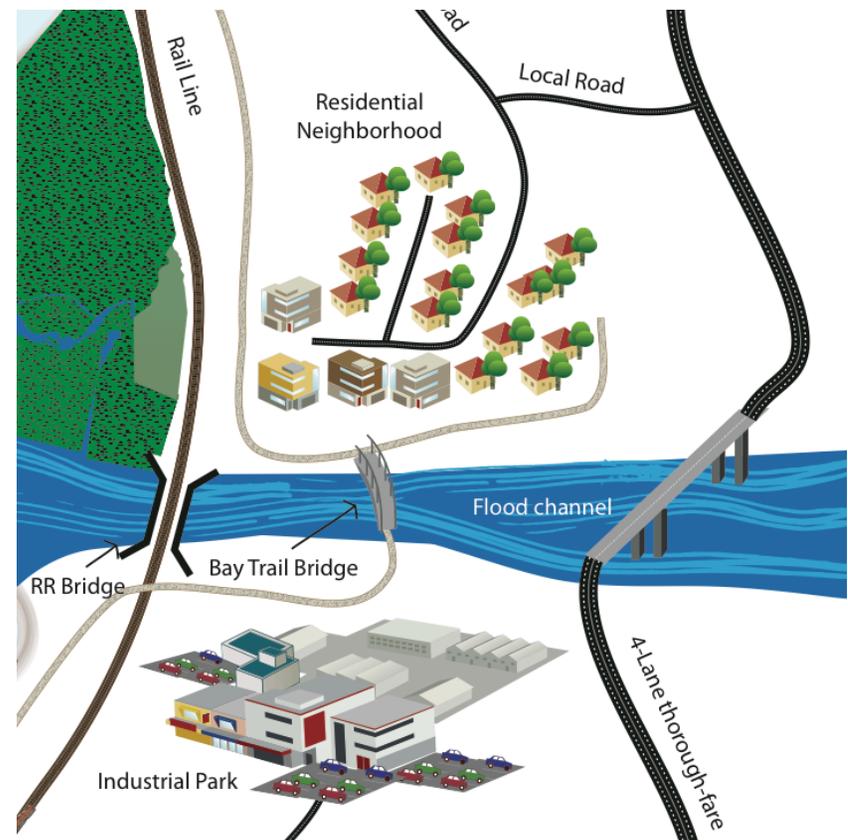


Exercise: Local and Regional Vulnerabilities and Actions



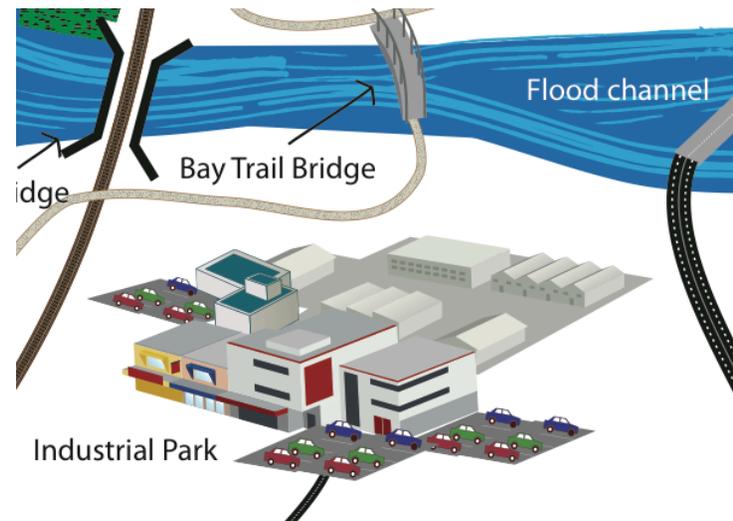
Your table facilitator will share with what we know about the local area and how it fits into the region

For example, there is a flood control channel spanned by three bridges, a neighborhood of single and multi-family homes, and an industrial park with over 500 employees



Exercise: Local and Regional Vulnerabilities and Actions

At your table, discuss the vulnerabilities of the local assets, and the local and regional consequences



Example local vulnerabilities:

- The flood control channel was designed for a 100-year storm, but now only conveys a 25-year storm due to deferred maintenance
- The railroad bridge is too low, and the rail track embankment is already eroding due to storm events and wave action
- The stormwater collection system in the industrial park is backing up during extreme high tides, causing flooding in the parking lots, travel ways and loading docks

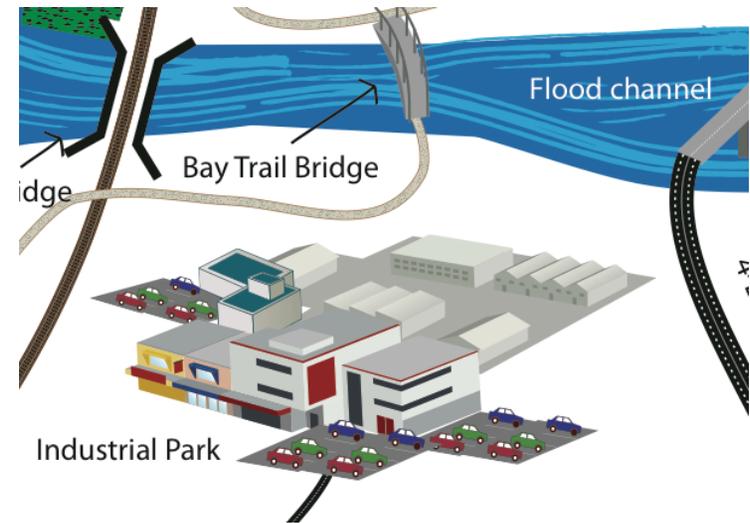
Exercise: Local and Regional Vulnerabilities and Actions

Example Local Consequences

- Lost tax revenue
- Increase commute time for local workers of the industrial park
- Strain on emergency responders

Example Regional Consequences

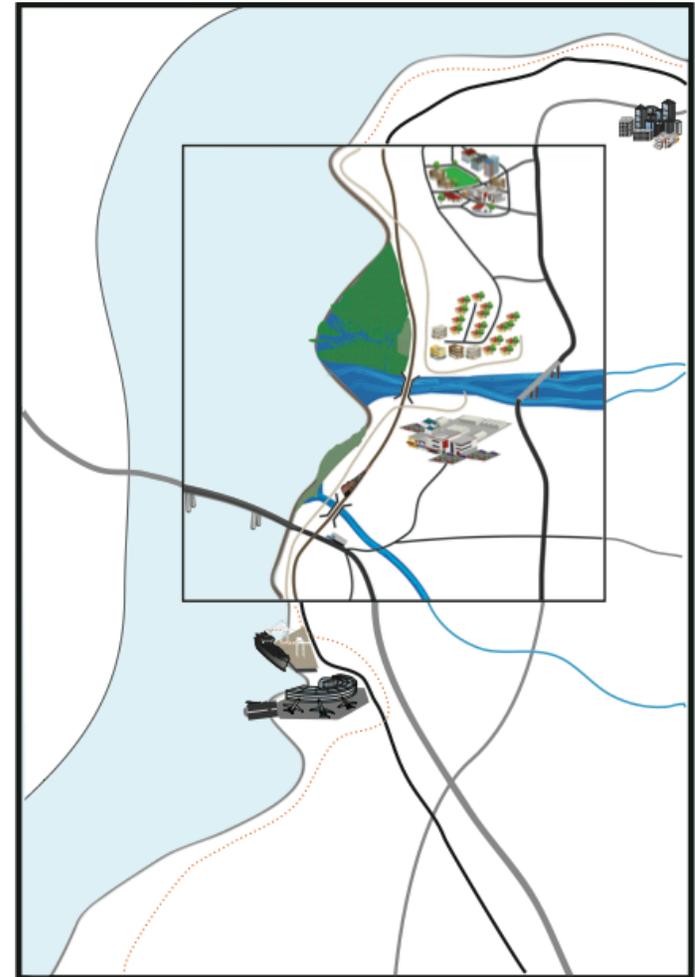
- Lost jobs and wages
- Broken supply chains
- Increased freeway congestion and air emissions due to loss of freight moved by rail
- Taxpayers/ratepayers impacts from response and recovery



Exercise: Local and Regional Vulnerabilities and Actions

Then, discuss how vulnerabilities elsewhere in the region could impact the function of the local assets

For example, if the airport is flooded, or the seaport cannot move goods via the road or rail networks, what impact will this have on the industrial park? On jobs? On the economy?



Exercise: Local and Regional Vulnerabilities and Actions



Now, your group will brainstorm what actions could be taken to address the local and regional vulnerabilities you identified

Try to come up with a variety of actions

- Research and analysis
- Data/info collection and sharing
- Vulnerability assessments
- Public education and outreach
- Physical strategies for adaptation
- Incentives
- Guidance and support
- Funding
- Regulations
- Plans and policies
- Institutional arrangements
- Collaborations
- Advocacy and influence

Conduct a campaign to build public support for a new stormwater tax to help maintain and improve the flood control channel

Table Top Discussion

Goal: Discuss how the region in general, and BCDC in particular, could support and encourage adaptation at the local and regional scales

The table facilitator will help you identify actions that:

- ✓ Need to be implemented regionally
- ✓ Can be implemented locally, but need regional support

Engage in a public-private collaboration to gather information from the railroad companies on regional track and bridge elevations and conditions

Table Top Discussion

For actions that need to be implemented regionally, or need regional support for implementation, discuss the following:

- What funding opportunities are there?
- Will advocacy be necessary?
- What information will be needed?
- What is the regulatory landscape?
- Are there institutional arrangements to support it?
- Would this action:
 - Build social resilience and equity?
 - Protect or enhance the environment?
 - Solve an information or governance challenge?
 - Build local or regional economic resilience
- What is the priority - is it only a local priority or is it also a regional priority?

Group Report Back and Discussion

- What was the highest priority or most interesting action you discussed
- What is the role of the region in this action, e.g., lead, support, fund....
- How could the region support implementation of this action, e.g.,
 - Provide guidance
 - Collect new information
 - Seek financing options
 - Garner political support

Wrap Up and Next Steps

Third Workshop

April 2016

Review and discussion of
January and March Findings

Fourth Workshop

May 2016

A Commissioner Conversation
about Next Steps and Direction

