

## 8.0 Sea Level Rise Draft Policies

### 8.1 Introduction

Much of the City of Arcata's Coastal Zone area is former tidelands of Humboldt Bay that has been protected by a system of dikes for over 100 years. Most of this area was never filled; therefore, if the dike system failed, these former tidelands would currently be inundated. The Humboldt Bay area is also tectonically subsiding, and the local rate of relative sea level rise is greater than anywhere else in California. **Add information from SLR report when it is completed.**

Sea level rise is an issue with city-wide impacts that will need to be addressed with city-wide solutions. The impacts of rising sea level will be felt beyond the boundary of the coastal zone as high tides back up into the City's creek system, causing potential flooding upstream.

The overall goal to address sea level rise impacts is to provide feasible and sustainable adaptation that preserves the economic function of the impacted area for as long as practicable, taking into account ecological integrity and social equity.

### 8.2 Overall Strategy

The City's strategy for sea level rise adaptation is a slow, measured retreat of the built environment. The City plans to protect and defend significant investments where feasible and practical, as long as the benefits of protection outweigh the costs. Accommodating and adapting to the rising seas will occur in areas where planned when it is infeasible to defend or relocate development. Retreat from sea level rise will occur where and when it is not feasible to defend development or accommodate the rising seas.

#### Protect and Defend

Protection strategies employ some sort of engineered structure or other physical measure to defend development in place without changes to the development itself. Existing development, such as the waste water treatment plant, South "G" Street commercial and industrial uses, working agricultural lands, and infrastructure should be protected by the least environmentally damaging means practicable. Where feasible, protective devices shall visibly blend into adjacent natural surroundings.

#### Accommodate and Adapt

Accommodation strategies employ methods that modify existing developments or design new developments to decrease hazard risks and thus increase the resiliency of development to the impacts of sea level rise. Over time, sea level rise will result in conversion of habitat types, especially in low lying areas including former tidelands. Structures and other development within areas that experience tidal flooding may need to adapt to accommodate periodic flooding and eventual inundation. Accommodation can also take other forms such as addressing drainage issues and locating new development away from low lying areas.

#### Retreat

Retreat strategies result in relocation or removal of existing development out of hazard areas and limitation on the construction of new development in vulnerable areas. Retreat will be slow and measured, with explicit measures preserving economic viability of existing and new development for as long as feasible, recognizing that the economic lifespan of any given project may safely fit within the timeframes of increasing flooding.

### 8.3 Policies

The following policies are not intended to be viewed as a stand-alone regulatory document. These draft regulations, when adopted by the City and certified by the Coastal Commission, will be one section of the City's overall Local Coastal Program. The City's Local Coastal Program includes many other policies related to development, environmentally sensitive habitat areas, public access, recreation, agriculture, and other coastal issues.

The City's Local Coastal Program is modeled after the California Coastal Commission's Guidelines and relies on the California Coastal Act. The following Coastal Act policies are relevant to and incorporated into the City's Sea Level Rise Policies:

**Water Supply and Flood Control.** Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for the public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat. (Coastal Act Section 30236)

**Construction Altering Natural Shoreline.** Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fishkills should be phased out or upgraded where feasible. (Coastal Act Section 30235)

### **8.3.1. Regional approaches – Collaboration with Regional Partners**

Sea level rise will affect all jurisdictions and agencies within the Humboldt Bay region. The City will work with the City of Eureka, the County of Humboldt, the Humboldt Bay Harbor Recreation and Conservation District, Caltrans, Pacific Gas and Electric, the North Coast Railroad Authority, landowners, and other stakeholders to collaborate on regional approaches to sea level rise.

**CSL-R1 Stakeholder Collaboration.** The City will assist in developing collaborative stakeholder group(s) that include: other jurisdictions, critical asset owners, property owners, shoreline protective structure managers, business owners, regulatory agencies, and interested public members. These stakeholders will assist in developing or reviewing bay-wide, watershed, drainage basin, and project specific, multipurpose sea level rise adaptation strategies and measures.

**CSL-R2 Collaboration with Regional Partners.** The City will work with regional partners to explore and encourage innovative solutions to adapt to sea level rise. Potential regional solutions may include:

- a. Installing hard engineered tidal barriers at the Humboldt Bay entrance, Eureka Slough entrance, and/or between Indian, Woodley, and Daby Islands that allow continued navigation, fish passage, and sediment transport while allowing temporary sea gates, pump stations, and offshore structures to be put in place.
- b. Constructing soft engineered islands, reefs, marshes, living shorelines or other features which mimic natural processes and offer shoreline protection by filling portions of Humboldt Bay.
- c. Utilizing oyster shells, navigation channel dredge spoils and other safe, local, suitable material to implement adaptation measures inland, along the shoreline, and within the waters of Humboldt

Bay.

- d. Raising existing dikes, railroads, highways and roads to protect existing development in place.

**CSL-R3 Mitigation Program.** The City supports development of a regional mitigation program to address the region's potential to fill wetlands in an effort to protect existing development. The program would involve creating wetland areas to be used as compensation for filling wetlands to create protective devices for existing development.

**CSL-R4 Education.** The City will work with community partners to educate the community about sea level rise impacts, including how to implement best management practices throughout the City to reduce vulnerability and risk from flooding hazards associated with sea level rise.

**CSL-R5 Preserve Undeveloped Shorelines.** The City shall encourage preservation and habitat enhancement of natural shoreline areas throughout Humboldt Bay that are vulnerable to future flooding, contain significant habitats or species, are suitable for ecosystem enhancement, and allow area for habitat migration as sea level rises.

**CSL-R6 Regional Protection Strategies.** The City will promote and participate in development of a regional entity for protection of existing development, restoration of coastal habitats, and preservation of public access and recreational opportunities on Humboldt Bay. The City will participate in regional efforts to seek funding for regional solutions to manage higher sea levels.

**CSL-R7 Acquisition and buyout program.** The City will collaborate with regional partners to seek funding, and work with property owners to acquire property at risk from flooding or inundation due to sea level rise.

**CSL-R8 Retrofit Transportation Infrastructure.** The City will work with Caltrans and the County of Humboldt to address sea level rise impacts to Highway 101, Highway 255, and adjacent County roads, and to retrofit the existing roadways to withstand flooding and provide a barrier to flooding inland.

### 8.3.2 Planning and Locating New Development

New Development proposed within areas subject to flooding shall be resilient to the effects of sea level rise without development of new protective devices except where planned. The City will establish an Urban Protection Area containing existing development. This area may be amended from time to time. The Urban Protection Area will be bounded by hard or soft protective structures that may currently exist or have yet to be built. Existing structures may require enhancement. When sea level rises beyond feasible and practical protection for this area, adaptation or retreat will be the most reasonable approach.

**CSL-P1 No New Hospitals and Public Safety Facilities.** No new hospitals, public safety facilities, power generation plants, airports, public corporation yards, and schools shall be developed within the area on the seaward side of Old Arcata Road/Samoa Boulevard.

**CSL-P2 Urban Protection Area.** The Urban Protection Area as shown on Figure C-\_\_\_ is planned to be defended by soft and hard protective devices. When sea level rises beyond feasible and practical protection for this area, adaptation or retreat will be the most reasonable approach.

**CSL-P3 Sea Level Rise Analysis Outside of the Urban Protection Area.** New development proposed within

sea level rise areas outside of the Urban Protection Area as shown on Figure C-\_\_\_ and on the seaward side of Old Arcata Road/Samoa Boulevard shall provide evidence that the development will be resilient to the effects of sea level rise for a period of time to allow a reasonable return on the investment for the development, using the best available and most recent sea level rise information. No future seawall or other hard protective structures will be allowed for new development in this area.

- CSL-P4 Sea Level Changes.** Siting and design of new shoreline development and protective devices outside of the Urban Protection Area shall take into account anticipated future changes in sea level. Development shall be set back a sufficient distance and/or elevated to a sufficient foundation height to eliminate or minimize, to the maximum extent feasible, flooding impacts associated with anticipated sea level rise.
- CSL-P5 New Structures Design for Sea Level Rise.** New structures shall be designed to withstand sea level rise by being resilient to two feet above the FEMA flood elevation, either by being located behind an existing protective structure or by adaptive design. New development is not guaranteed protection from hazards including flooding or inundation due to sea level rise.
- CSL-P6 Options for Removal, Retreat, or Elevation of New Development.** New development shall be removed, relocated, elevated, or otherwise adapted and made resilient if it becomes threatened by inundation due to sea level rise.
- CSL-P7 Cluster New Development.** New development in the Coastal Zone shall be concentrated in areas that can accommodate it without significant adverse effects on coastal resources. Siting shall take potential coastal hazards into account by concentrating development outside of hazard areas. New development in areas adjacent to ESHAs should be clustered away from land where wetlands and other coastal habitats could migrate as sea level rises. New development should be clustered into existing developed areas such as the Urban Protection Area.
- CSL-P8 Phased Implementation of Transportation Projects.** As sea level rises and existing roads are periodically flooded, alternate transportation routes shall be established to accommodate traffic. Recognizing that periodic flooding of low lying roads could result in hazardous conditions or delays, transportation routes shall be maintained, retrofitted, and re-routed to accommodate sea level rise, until such time as retreat is the only viable option. The City will coordinate with Caltrans, the County of Humboldt, and the City of Eureka to ensure that planned transportation networks meet the needs of the City and the region.
- CSL-P9 Design Coastal-dependent Infrastructure to Accommodate Sea Level Rise.** Coastal-dependent infrastructure, such as industrial, transportation, and energy facilities, that must be sited in near-coast locations shall be designed to withstand future impacts associated with sea level rise. Infrastructure shall minimize risks to other coastal resources through initial siting, design, and features that will allow for future adaptation to rising sea levels, based on the best available scientific data.
- CSL-P10 Wastewater Treatment Plant.** The City's wastewater treatment plant is located on former tidelands of Humboldt Bay in an area that is vulnerable to sea level rise. The City should continue to protect the wastewater treatment plant from sea level rise impacts using living shorelines and other cost effective barriers. The existing levee system for the plant should be augmented to withstand sea level rise to an appropriate height given the best available science.

Hard and soft protection devices are allowed and are likely to require the filling of wetlands.

**CSL-P11 Limits on Corporation Yard Expansion.** Development of the City corporation yard facilities shall be restricted to the existing boundaries, or moved to an alternate location that is not subject to flooding impacts from sea level rise during the lifespan of the improvements.

**CSL-P12 Innovative Development.** To ensure continued economic, recreational, coastal dependent, and other beneficial uses, using innovative, adaptive approaches for reuse of properties shall be allowed and encouraged. This may include siting structures over water or over areas that are periodically inundated.

**CSL-P13 No New Shoreline Protection for New Development and New Lots.** New development in the area that is outside of the Urban Protection Zone and on the seaward side of Old Arcata Road/Samoa Boulevard shall include a waiver of rights to shoreline protection measures that would substantially alter natural landforms or cause other adverse coastal resource impacts. New lots created outside of the Urban Protection Area and on the seaward side of Old Arcata Road/Samoa Boulevard are only allowed if they are created for public trust benefit.

**CSL-P14 Long-Term Public Works Plan for Critical Facilities.** The City shall develop a long-term management plan to address sea level rise that incorporates any potential maintenance, relocation, protection, or retrofits and structural changes to critical city-owned facilities to accommodate changes in sea level.

### **8.3.3 Recreation and Visitor Serving**

**CSL-V1 Marsh and Wildlife Sanctuary.** The City of Arcata wastewater treatment plant is designed with treatment wetlands that also act as a marsh and wildlife sanctuary. Trails located within this area provide recreational opportunities for City residents and visitors. To the extent practicable, structures designed to protect existing development and coastal dependent uses from erosion and effects of sea level rise will incorporate trails and other recreational amenities as needed.

**CSL-V2 Arcata Marsh Interpretive Center.** The City of Arcata Marsh Interpretive Center is located within the Marsh and Wildlife Sanctuary in an area that is vulnerable to sea level rise. The parking area and the South "G" Street access road are predicted to be inundated with two to three feet of sea level rise if no additional protection is constructed. The structure itself is not expected to be impacted until after more than six feet of sea level rise. Protection of the wastewater treatment plant may also include protection for the interpretive center, parking facility, and access road.

### **8.3.4 Water Quality Protection**

**CSL-W1 Update Water Quality Best Management Practices.** These practices should be updated to incorporate changes in water quality impacts associated with sea level rise flooding.

**CSL-W2 Sea Level Rise in Stormwater Control Plans and Actions.** Stormwater control plans should include measures to minimize impacts to water quality from pollutants, sediments, and nutrients entering water bodies through precipitation-generated runoff. Sea level rise and extreme storm events should be addressed in the plan.

**CSL-W3 Retrofitting Inadequate Stormwater Infrastructure.** The City shall identify and prioritize

existing development in low lying areas that have inadequate stormwater infrastructure. The City shall work with property owners to retrofit these systems to better accommodate flooding due to sea level rise using green stormwater infrastructure strategies.

**CSL-W4 Potential Pollutant Sources.** Figure C-\_\_ shows the potential pollutant sources that could result in pollutant release as a result of sea level rise, including hazardous waste sites, outfalls, the City's wastewater treatment facility, and sewer lift stations. The City shall work with land owners and regional partners to remove and relocate pollutant sources to outside of potential sea level rise areas.

### **8.3.5 Environmentally Sensitive Habitats**

**CSL-E1 Sea Level Rise in Habitat Projects.** Sea level rise impacts shall be addressed in management plans for coastal habitats. Such evaluations should consider both topographic features as well as habitat and species sensitivities (for example, sensitivity to inundation and saltwater intrusion). Habitat management plans and/or other habitat projects should use an adaptive management approach with clearly defined triggers for adaptive actions, to ensure that coastal habitats are able to migrate and transition with changes in sea level. Sea levels will be monitored and evaluated for impacts on a regional level.

**CSL-E2 Habitat Connectivity to Allow Species Movement.** New structures such as highways, medians, bridges, culverts, walls, fences and other development in response to sea level rise shall be designed to facilitate movement of wild animals along wildlife corridors.

**CSL-E3 Open Space Preservation and Conservation.** The Jacoby Creek/Gannon Slough wildlife area owned by the City is already encumbered by restrictions prohibiting residential and other uses that are not consistent with Arcata's open space and conservation goals.

### **8.3.6. Coastal Hazards/Shoreline Protection**

**CSL-H1 Soft Coastal Protective Devices.** Soft coastal protection including the construction of engineered islands, reefs, marshes, living shorelines (horizontal levees) and other biotechnical approaches that mimic natural processes shall be encouraged to allow natural biological processes as a component of a levee system. The City may use an engineered living shoreline or fringe salt marsh to protect vulnerable City facilities.

**CSL-H2 Hard Coastal Protective Devices.** Hard coastal protection includes engineered features such as seawalls, revetments, dikes and levees, roads, and trails that block the landward retreat of the shoreline and provide little or no habitat value but may provide recreation and coastal access opportunities. Existing hard coastal protection may be augmented to protect existing development, and gaps may be filled where planned to afford such protection. For the existing Industrial, Commercial, and Residential developments south of Samoa Boulevard including the Arcata wastewater treatment facility as mapped on Figure \_\_, shoreline protection shall be retained, monitored, and augmented to protect existing developed areas to an elevation of at least 18 feet (NAVD 88 elevation), or to an alternative elevation given the best available science and economic feasibility of protecting the area.

**CSL-H3 Maintenance of Shoreline Protection Structures.** Routine monitoring and maintenance of shoreline protection structures shall occur. Structures shall be examined for structural deterioration, excessive scour, or other damage, and repaired to maintain viability.

- CSL-H4 Beneficial Reuse of Sediment through Dredging Management.** The City shall work with other local jurisdictions and agencies to reuse clean sediment from bay dredging operations to create living shorelines where needed and appropriate. Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation.
- CSL-H5 Secure Easements for Adaptation Planning.** The City shall work with property owners within and adjacent to the proposed Urban Protection Area to secure easements for future sea level rise protective devices.
- CSL-H6 Transfer of Development Rights.** Areas vulnerable to sea level rise may be eligible to transfer development rights to parcels with less vulnerability to hazards.
- CSL-H7 Rolling Affirmative Easements.** The City may pursue rolling affirmative easements on appropriate bayshore lands to ensure access along the shore as the shore migrates inland. Such easements may include requirements to remove structures and development that block access to the shoreline.
- CSL-H8 Protective Devices within the Urban Protection Area.** The City shall seek funding from state and federal programs to construct and maintain protective devices for the Urban Protection Area as shown in Figure \_\_. A City-wide fee, tax, or other assessment may also be collected to construct and maintain protective devices in this area. Both hard and soft protective devices will be allowed to defend this area.
- CSL-H9 Wetland Fill Allowed to Protect Urban Protection Area.** In the Urban Protection Area, if it can be shown that all feasible alternatives have been exhausted, the City may fill wetlands for the installation of hard or soft protective structures. Wetland fill shall be the least amount practicable for the necessary protection. Converted or created wetlands, including living shorelines and uplands converted to wetlands, may be used as compensatory mitigation for wetland fill.
- CSL-H10 Citywide funding to protect Wastewater Treatment Plant.** The City shall pursue a funding mechanism to augment and maintain existing protective structures for and access to the wastewater treatment plant. This could include a citywide assessment or other means.
- CSL-H11 Infill Development Allowed within the Urban Protection Area.** New development and redevelopment shall be allowed within the Urban Protection Area that is protected from sea level rise impacts by dikes and other means. Property owners will be informed of the elevation to which the area is designed to be protected. No extraordinary base floor elevation heights will be required for structures that are protected by other structures such as seawalls and dikes.
- CSL-H12 Mandatory Disclosure.** For areas within the Urban Protection Area, mandatory disclosure of rising sea levels and potential hazards shall be included on all building permits and subdivision maps.
- CSL-H13 Mandatory Acknowledgement and Release of Liability.** For areas within the Urban Protection Area, property owners proposing new development will be required to sign an acknowledgment, release of liability, and hold harmless agreement, including a waiver of the right to sue the City in the event that the property is damaged due to any hazard, including coastal flooding.

**CSL-H14 Sea Level Rise Protective Structures Outside of the Urban Protection Area.** Property owners are allowed to construct protective structures outside of the Urban Protection Area to protect existing development. Wetland fill policies of the Local Coastal Program pertain, and coastal resources shall be protected. New development or substantial improvement on parcels potentially subject to sea level rise inundation outside of the Urban Protection Area shall only be approved with conditions requiring that no shoreline protective structure be constructed in the future to protect the development from erosion or flooding.

**CSL-H15 Removal of Shoreline Protective Structures.** If a “tipping point” is reached at a specific location, and the City determines that it is no longer feasible to construct and maintain protective shoreline structures from the effects of coastal flooding and erosion, existing development may need to be abandoned or relocated outside of the coastal hazard areas. At such time, existing shoreline protective structures shall either be modified into a revised adaptation measure or removed to allow natural processes and responses to sea level rise.

### **8.3.7 Public Access**

**CSL-PA1 Protect Coastal Access Opportunities.** Shoreline structures shall incorporate public access trails, boardwalks, and viewpoints whenever practical and desirable.

**CSL-PA2 Coastal Trails.** The City will work with Caltrans and applicable agencies to incorporate portions of the California Coastal Trail and other trails within rights of way using similar retrofit options to avoid impacts from future sea level rise (boardwalks, bridges, etc.). The California Coastal Trail will remain within sight of Humboldt Bay where feasible.

**CSL-PA3 Designing New Public Access Sites.** Newly proposed public access sites, segments of the California Coastal Trail, and recreation and visitor serving facilities shall be sited and designed to minimize impacts from flooding and coastal erosion due to climate change. For facilities that can be safely sited for the near term but future impacts are likely, an adaptive management plan detailing steps for maintenance, retrofitting and/or relocation shall be required.

### **8.3.8 Scenic and Visual Resources**

**CSL-S1 Adaptation Strategies and Visual Resources.** The City shall encourage the use of adaptation strategies to sea level rise that will not impact visual resources. This may include short-term retrofits of existing structures and longer term relocation or removal within scenic areas.

### **8.3.9 Archaeological and Cultural Resources**

**CSL-AC1 Sea-level Rise and Cultural, Archaeological and Paleontological Resources.** The City will support local tribes’ efforts to identify, document, and, where appropriate, preserve and protect cultural resources from the effects of sea level rise and coastal flooding.

### **8.3.10 Agricultural Resources**

**CSL-A1 City owned Agricultural Lands east of Highway 101.** Sea level rise will eventually impact the city-owned agricultural lands east of Highway 101, south of Samoa Boulevard, and west of Old Arcata Road. Coastal wetland habitats will be allowed to migrate onto the City-owned Jacoby

Creek/Gannon Slough Wildlife Area as part of the overall management of the wildlife area.

**CSL-A2 Saltwater Intrusion Conversion.** Agricultural lands converted to marsh land by saltwater intrusion due to sea level rise or other natural conditions may be redesignated as Natural Resource lands at such time as agricultural uses are no longer viable.

**CSL-A3 Replacement of Recreation Areas.** Sea level rise may eventually convert agricultural land east of Highway 101, south of Samoa Blvd. and west of Old Arcata Road to tidal lands. The City may provide recreational trails in the upland portion of this area to replace other passive recreational areas lost to sea level rise.

**CSL-A4 Agricultural Water Quality Impacts.** Agricultural practices may need to be updated or enhanced to ensure water quality protection as required by federal, state, or local regulations if climate change or other natural conditions result in more frequent flooding of agricultural lands.

**CSL-A5 Rising Groundwater.** Clean fill material may be imported and placed on previously compacted or subsided agricultural properties to raise the surface elevation of these former tide lands to make them more resilient to rising groundwater and sea level rise. In areas where fill material is placed on existing wetlands, the depth of fill must allow continuation of wetland characteristics such that no net loss of wetlands shall occur.

**CSL-A6 Agriculture Protection, Maintenance and Adaptation of Dikes and Levees.** Existing agricultural areas within the City's Coastal Zone are partially protected by a series of dikes and drainage structures. These dikes may be maintained and adapted to protect the agricultural lands from sea level rise impacts for as long as feasible.