

# San Juan County [Draft] Best Available Science Synthesis

## FREQUENTLY FLOODED AREAS

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# SELECTION OF BEST AVAILABLE SCIENCE

- State-issued guidance (e.g., CTED)
- Existing documents owned by County
- Publicly-submitted documents
- Online searches (e.g., NOAA, NRCS, USGS)
- Other counties' BAS lists, for journal articles and books

# DEFINITION OF FREQUENTLY FLOODED AREAS

- “*Flood plains and other areas subject to flooding*” (WAC 365-190-110)
  - These include, at a minimum, the **100-year flood plain** designations of the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP).

## In San Juan County:

- No large river systems; fewer severe stream-related flood events.
- Few inland flood areas; adjacent to lakes, ponds, wetlands, swales, and any low-lying areas where water accumulates
- Primary threat is coastal flooding →



# PROTECTION OF FREQUENTLY FLOODED AREAS

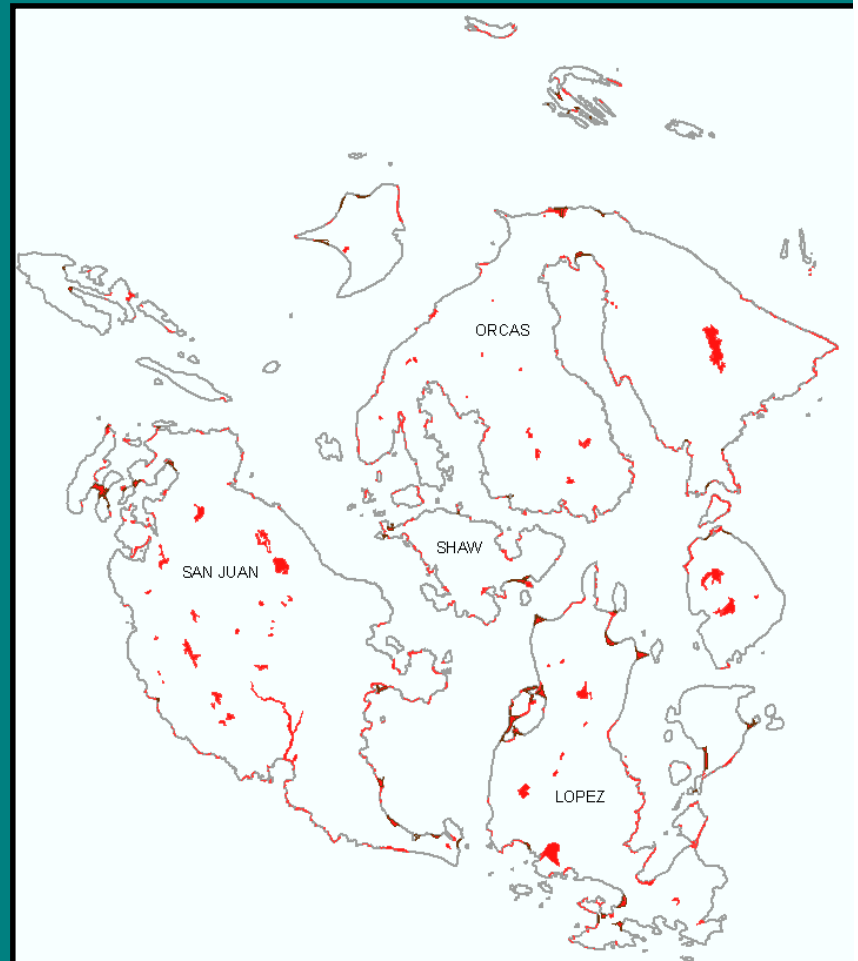
- “Functions and Values:”
  - Conveyance of flood waters
  - Ecological functions: transport of woody debris, temporary alteration of habitat
  - Groundwater recharge
- Relevant Code (UDC) citations:
  - Section 18.30.130 (Critical Areas)
  - Section 13.04 (Stormwater Utility)
  - Section 15.12 (Flood Hazard Control Regulations)



# IDENTIFICATION OF FREQUENTLY FLOODED AREAS

- FIRMs

- 100-year floodplain (or “base flood”) is designated as **Zone A, Area of Special Flood Hazard**
- Inaccurate in some areas; technology has changed greatly since 1977
- **All of San Juan County’s shorelines** are identified as “Zone A” because regular tidewaters rise above the ordinary high water mark



# CLASSIFICATION OF FREQUENTLY FLOODED AREAS

- The WAC directs that certain factors be considered in designating and classifying Frequently Flooded Areas:
  - Effects of flooding on human health and safety, and to public facilities and services;
  - Available documentation including federal, state, and local laws, regulations, and programs, local studies and maps; and federal flood insurance programs, including the provisions for urban growth areas in RCW 36.70A.110;
  - The future flow floodplain, defined as the channel of a stream and that portion of the adjoining floodplain that is necessary to contain and discharge the base flood flow at build-out;
  - Greater surface runoff caused by increasing impervious surfaces; and
  - Coastal hazards including tsunami waves, high tides with strong winds, sea level rise, and extreme weather events, including those potentially resulting from global climate change (WAC 365-190-110(2)(d)).

# INCREASED IMPERVIOUS SURFACES



- Building structures and creating roads, driveways, and other impervious surfaces concentrates runoff and reduces the area available for infiltration
- Low Impact Development (LID) practices can minimize the impacts of stormwater:
  - combines the use of on-site natural features and engineered systems to re-create pre-development hydrologic functions
  - Minimizes site disturbance and reliance on BMPs
  - Local information available in the *Low Impact Development Technical Guidance Manual for Puget Sound* (Puget Sound Action Team 2005)



# TSUNAMI WAVES, CONTINUED

- Characterized as “the tide rising in minutes rather than hours,” to a height of approximately ten feet (20’ in narrow inlets)
- Would affect all low-lying coastal development; worse during high tide
- Likelihood of 10-14% for a tsunami generated from an earthquake ( $\geq 9.0$  magnitude) within the Puget Sound in the next 50 years
- San Juan County does not have an official tsunami hazard map



# SEA LEVEL RISE

- The global climate is changing; this presents habitat impacts and also directly affects:
  - sea level
  - wave energy
  - the intensity of storms
- Sea levels rise due to the following factors:
  - the thermal expansion of sea water
  - tectonic movement
  - melting glaciers and ice fields
  - local atmospheric circulation effects
- Thermal expansion is the link between global climate change and sea level rise. It accounts for about half the amount of anticipated sea level rise in the next century.

## SEA LEVEL RISE, CONTINUED

- Must consider El Niño and other local atmospheric phenomena in predicting sea level rise, such as the Pacific Decadal Oscillation
- Temperatures in the Puget Sound region are predicted to rise an average of  $0.6^{\circ}$  per decade during the period of 1990-2040
- Sea levels in the Puget Sound region are predicted to rise up to 68.9” by the year 2100
- During the planning phase of public infrastructure and coastal development projects, the potential rise in sea level must be considered



# OPTIONS FOR THE PROTECTION OF FREQUENTLY FLOODED AREAS

*\*Common overlap with other critical areas provides adequate protections for the functions and values of Frequently Flooded Areas in San Juan County.*

- Retrofit or maintain stormwater collection and drainage infrastructure
- Avoid development within the Special Flood Hazard Area, especially for essential public facilities and land uses where people congregate
- Additional protection is achieved by avoiding siting essential public facilities within 15 vertical feet above the mean high water mark

# DATA GAPS

- FIRMs are inaccurate and outdated- need to be revised
- San Juan County needs an official tsunami hazard map