



# Flood Hazard on Squaxin Island



**Flooding** is a naturally occurring cycle. It occurs when the volume of precipitation (rain or snow) exceeds the capacity of river banks, creeks, etc., to keep flowing waters contained. Since 1953, floods are one of the most common and often the costliest hazard in Mason County. Mason County has received 10 Federal Disaster Declarations for flood. This does not include severe storm events, which also may include flooding. That would include an additional 12 events since 1953. Several factors determine the severity of floods, including: precipitation (rain and snow), intensity, and duration; soil saturation conditions, and topography and ground cover.

## Types of Flooding

- River or stream flooding** occurs with prolonged heavy rainfall, melting snow, or a combination of these.
- Urban flooding** results from intense storms dropping large volumes of rain within a short period of time, exceeding the capacity of stormwater management systems.
- Tidal flooding** results when extremely high tides combine with low atmospheric pressure, excessive run-off, or strong northerly winds. The tides can also enhance flooding in delta areas when rivers or creeks are at or near flood stage. Sea level rise will exacerbate tidal flooding.
- Groundwater flooding** occurs when there is a high water table and persistent heavy rains in area where an upper, thin layer of permeable soils overlays an impermeable layer of hardpan. As the ground absorbs more rain, the groundwater table rises, resulting in flooding where land surface is below the water table.

## Effects if Flooding

The effects of floods are devastating. Aside from inundation of lands and property with sediment-filled waters, floods also result in:

- Death or injury to people, pets, and livestock;
- People stranded or isolated for extended periods of time;
- Physical destruction of infrastructure which support communities, such as roads, bridges, railroads, pipelines, and utility systems;
- Contaminated water sources and water treatment systems;
- Compromised septic systems, destroyed electrical and heating systems; and
- Restricted or limited access for emergency responders.

## Vulnerability

Portions of the Squaxin Island Reservation and tribal lands have a history of flood events (see table below). Over time, their frequency has been increasing, suggesting a high probability of future flood occurrences. With Sea Level Rise, those numbers will only increase. FEMA has developed the National Flood Insurance Program (discussed right), which provides insurance coverage specifically for flood events. The Tribe does have an assigned Community Number. While FEMA has mapped the SIT, the Tribe has not adopted those maps. To be a member of the NFIP, the Tribe would be required to establish land use authority restricting development to some degree either through land use development codes or mitigation actions in those areas depicted within the 100- or 500-year flood zones identified in Illustration #3.

| STORM DISASTER HISTORY BY MONTH, RECURRENCE, AND PROBABILITY OF OCCURRENCE (1953-2022) |          |          |          |          |          |          |          |          |          |          |          |          |           |   |           |  |  |
|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|---|-----------|--|--|
| Hazard Type  | Jan      | Feb      | Mar      | Apr      | May      | June     | July     | Aug      | Sept     | Oct      | Nov      | Dec      | Total     | Years of Occurrence                             | FEMA Rank | Recurrence / Years (No Order of Magnitude) | Probability / (Percent risk that an event may occur) |
|  | Flood    | 2        | 1        | 1        | 2        | 0        | 0        | 0        | 0        | 0        | 0        | 1        | 3         |   |           |  |  |
| Severe Storm   | 3        | 1        | 4        | 1        | 1        | 0        | 0        | 0        | 0        | 0        | 1        | 1        | 12        | 93, 96, 97, 03, 06, 07 (x2), 09, 12, 16, 19, 21 | 1         | 5.4  | 18.46  |
| <b>TOTAL</b>   | <b>5</b> | <b>2</b> | <b>5</b> | <b>3</b> | <b>1</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>2</b> | <b>4</b> | <b>22</b> |   |           |  |  |

Based on FEMA designation and dates.

## National Flood Insurance Program (NFIP)

Congress established the NFIP in 1968. The NFIP allows property owners in participating communities to purchase insurance to protect against flood losses in exchange for floodplain management regulations that reduce future flood damage. Mason County is a member of the NFIP, meaning that homeowners are able to get flood insurance to protect their homes. For most communities, FEMA has prepared a detailed Flood Insurance Study (FIS) which identifies areas where flooding is a concern (see Illustration 1). The FIS presents water surface elevations for floods of various magnitudes, including the 100- and the 500-year floods, which are called the Base Flood Elevations. The boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. Illustration 2 identifies those areas in Mason County; Illustration 3 identifies the 100- and 500-year floodplain. While they are called 100- and 500-year floods, that is just a means to define a flood of a specific magnitude. It does not mean that occur only every 100 or 500 years. The reference to a 100- or 500-year event means that in each given year, there is a 1 percent chance for a 100-year flood, or a 0.2 percent chance for a 500-year flood of the same magnitude to occur. 100-year or 500-year floods can occur at any time, several times per year! It is a way to equally measure the magnitude of the flood by comparing previous events of the same level.

Illustration 1: FEMA 2017 Flood

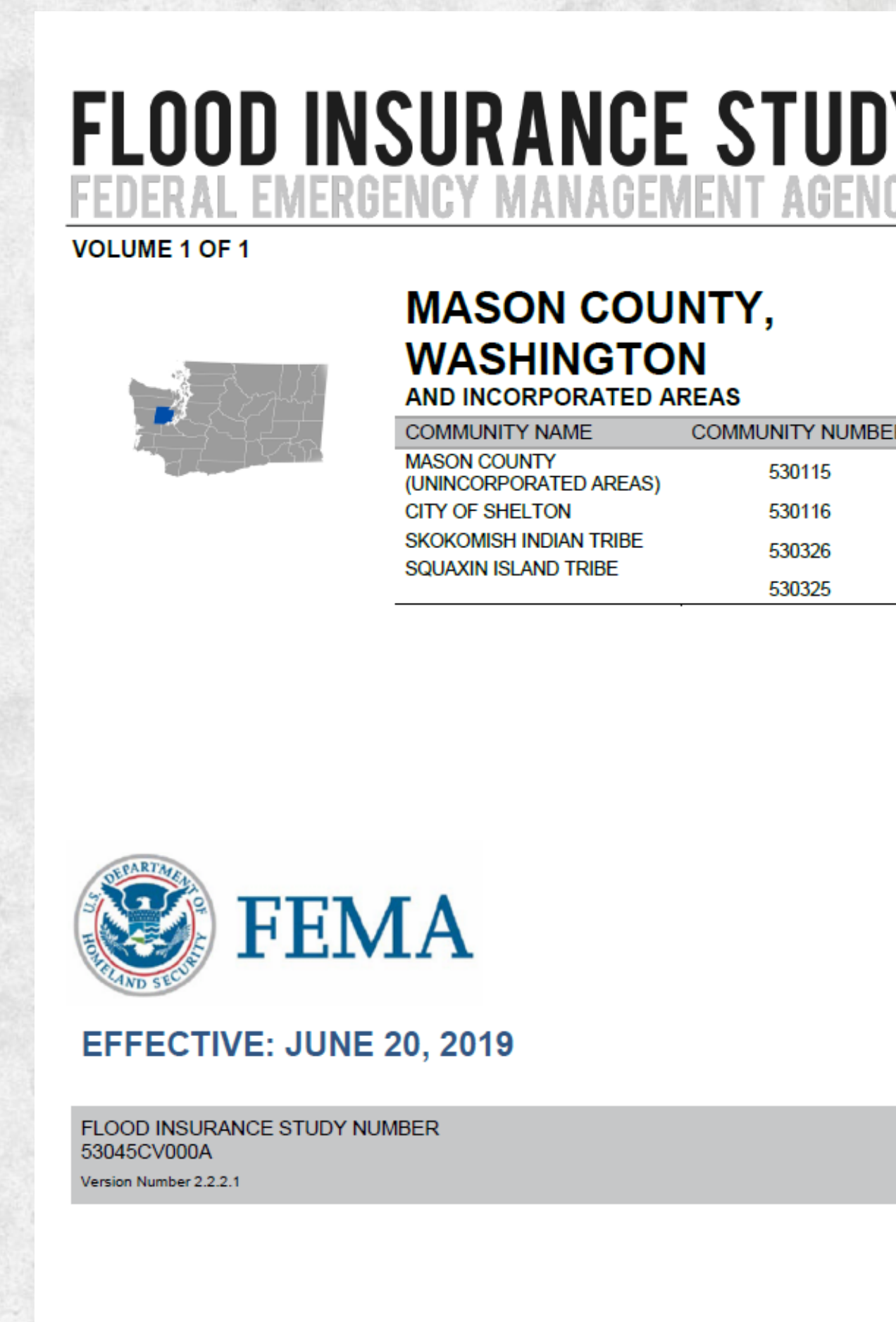


Illustration 2: FEMA's Flood Panels

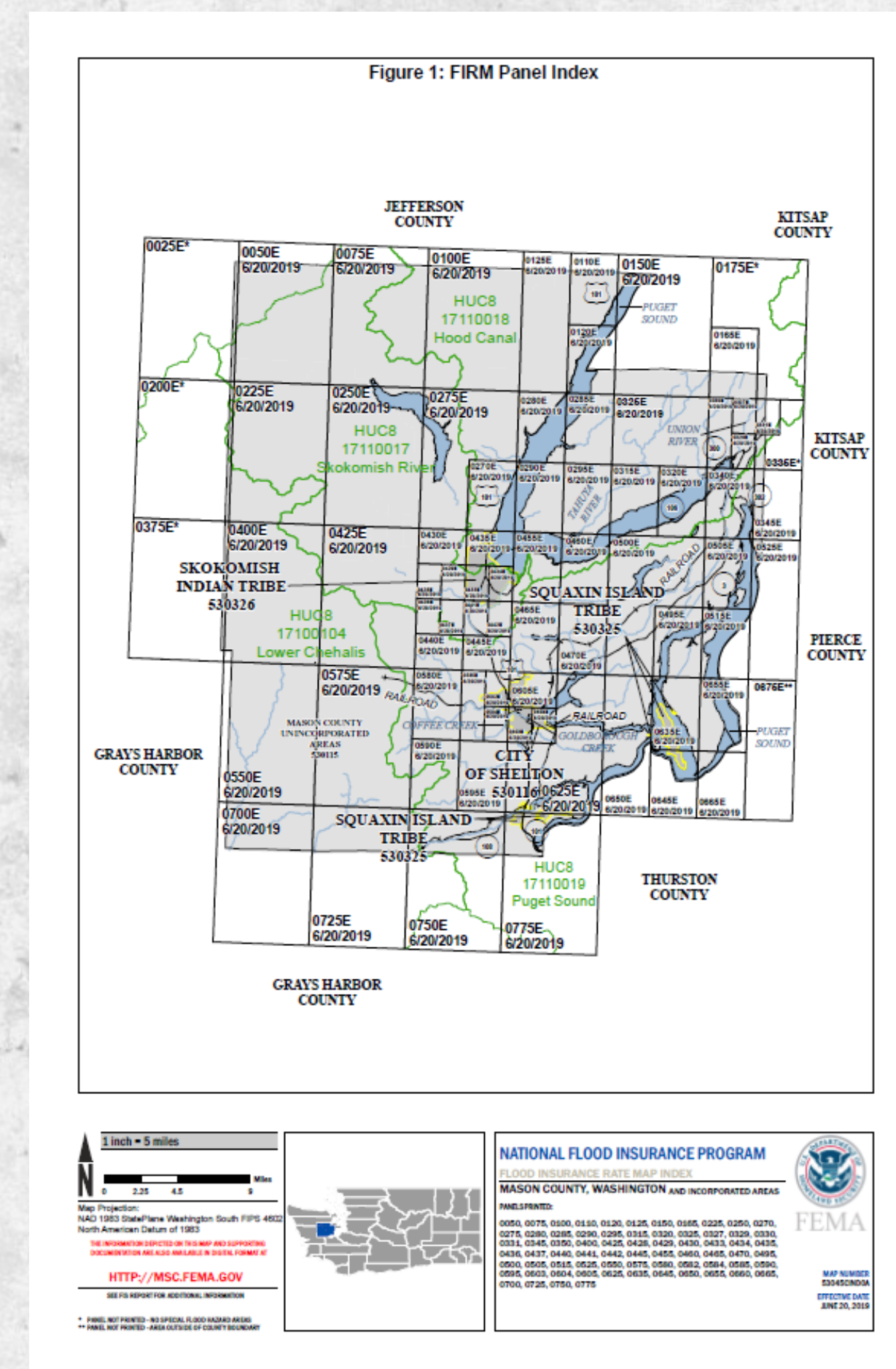


Illustration 3: Flood Hazard Areas 100- and 500-Year

