

Washington State Blue Ribbon Panel:

How much is due to local sources compared with global atmospheric and ocean sources? What can we do locally?

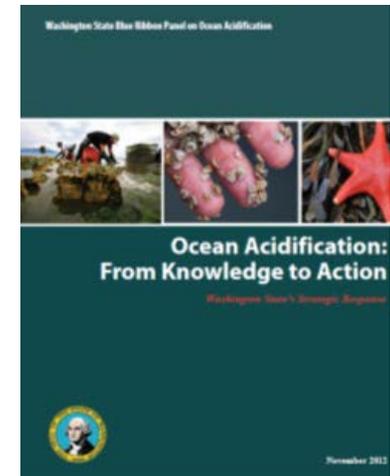
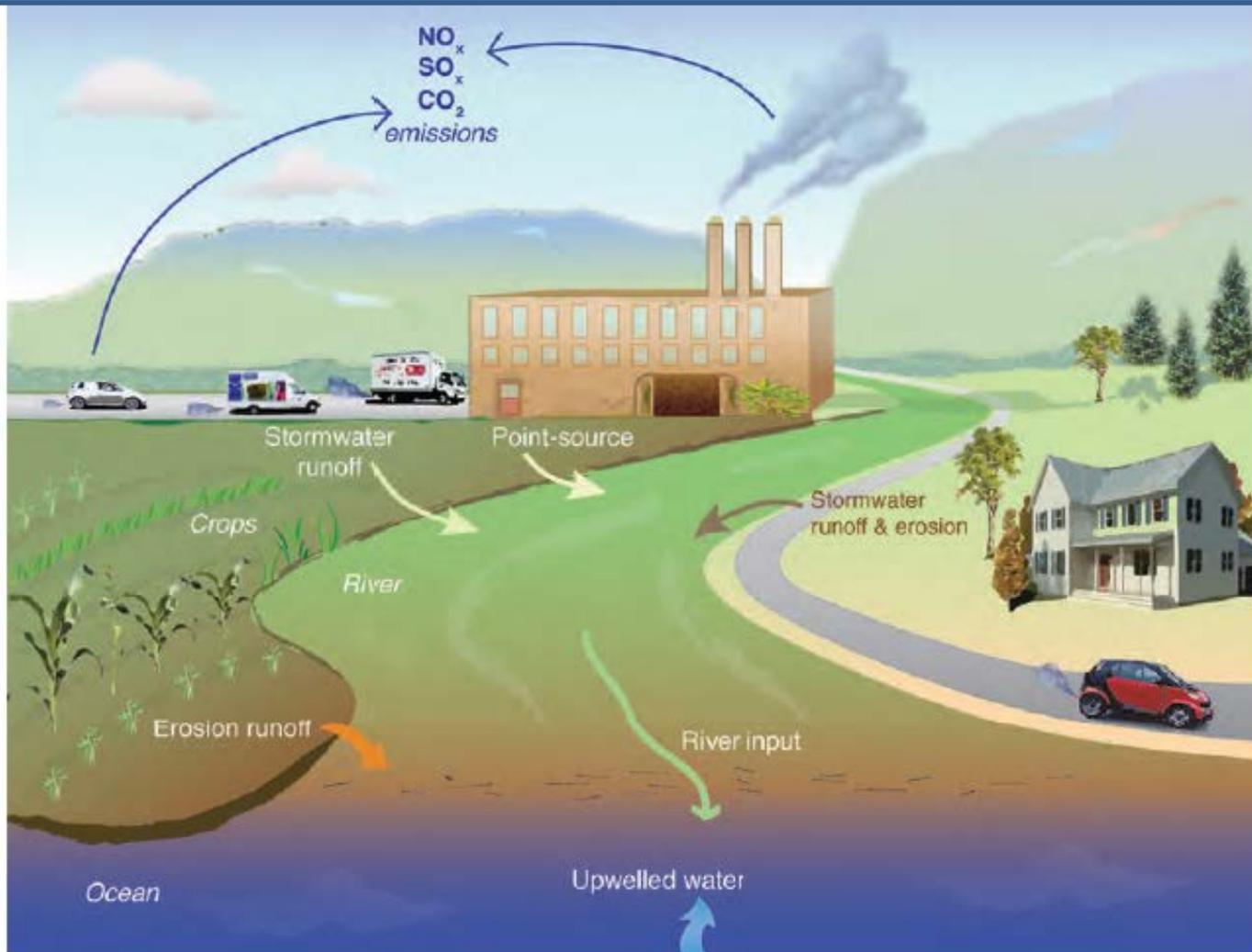


Figure 2. A range of sources, including upwelled seawater rich in carbon dioxide (CO₂) and excess nutrients and organic carbon from point and nonpoint sources, can contribute to acidification of marine waters. Absorption of carbon dioxide, nitrogen oxides (NO_x), and sulfur oxides (SO_x) from the atmosphere into marine waters may also be important in some local areas (adapted from Kelly et al., 2011).²⁹

Reducing inputs of nutrients and organic carbon from local sources will decrease acidity in Washington's marine waters that are impacted by these local sources and thereby decrease the effects of ocean acidification on local marine species.

Strategy 5.2 – Impose stringent controls to reduce and limit nutrients and organic carbon from sources that are contributing significantly to acidification of Washington's marine waters.

Action 5.2.1: If it is scientifically determined that nutrients from small and large on-site sewage systems are contributing to local acidification, require the installation of advanced treatment technologies.

Action 5.2.2: If determined necessary based on scientific data, reduce nutrient loading and organic carbon from point source discharges.

Strategy 7.2 - Identify factors that contribute to ocean acidification in Washington waters, and estimate the relative contribution of each.

Action 7.2.1: Quantify key natural and human-influenced processes that contribute to acidification based on estimates of sources, sinks, and transfer rates for carbon and nitrogen. [KEA]

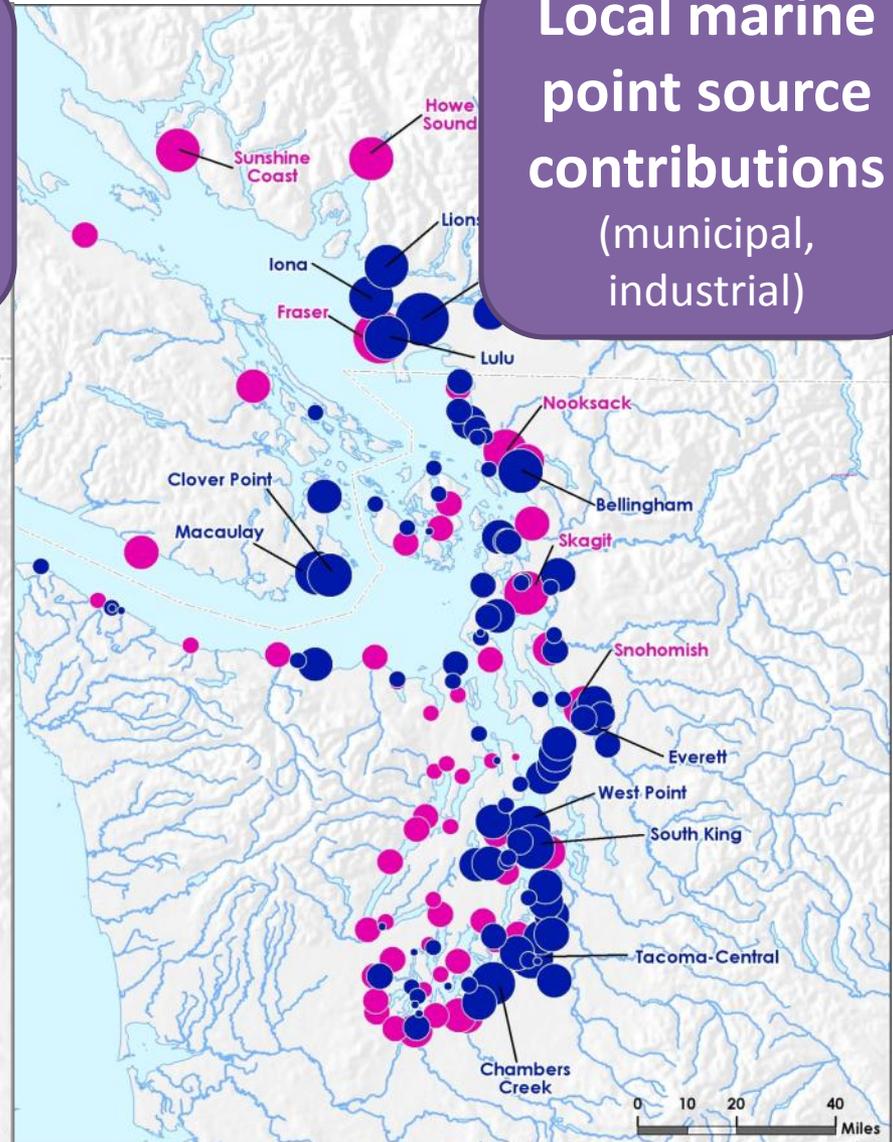
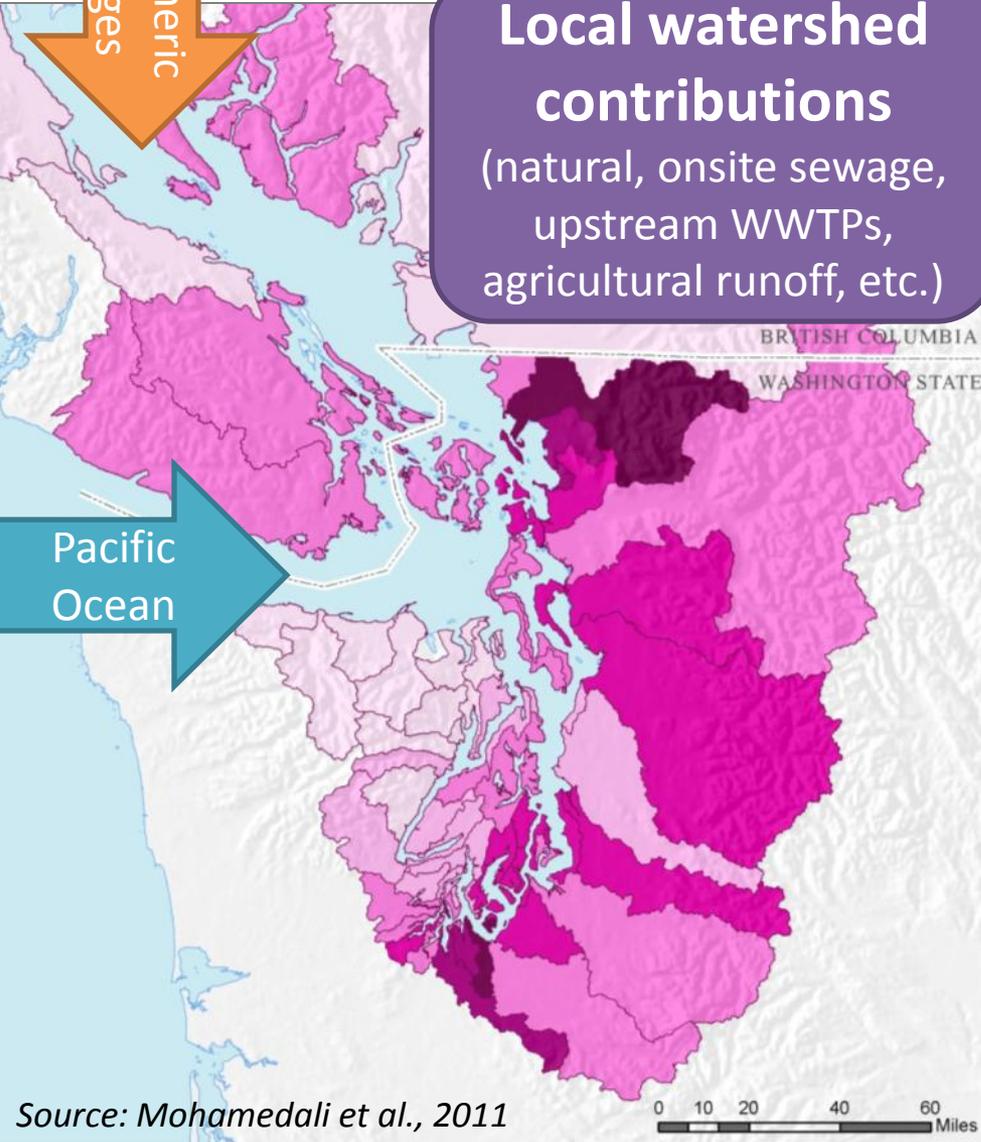
Who contributes what, globally and locally?

Atmospheric exchanges

Local watershed contributions
(natural, onsite sewage, upstream WWTPs, agricultural runoff, etc.)

Local marine point source contributions
(municipal, industrial)

Pacific Ocean



Source: Mohamedali et al., 2011

Relevant work partly underway...

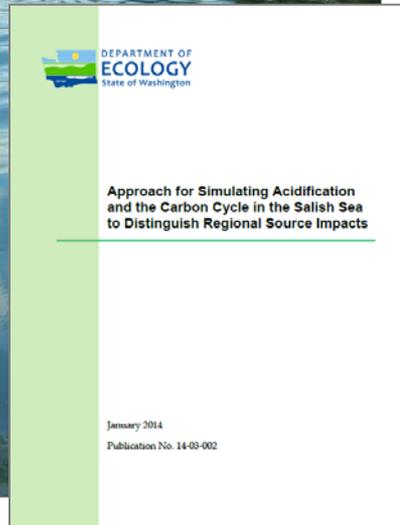
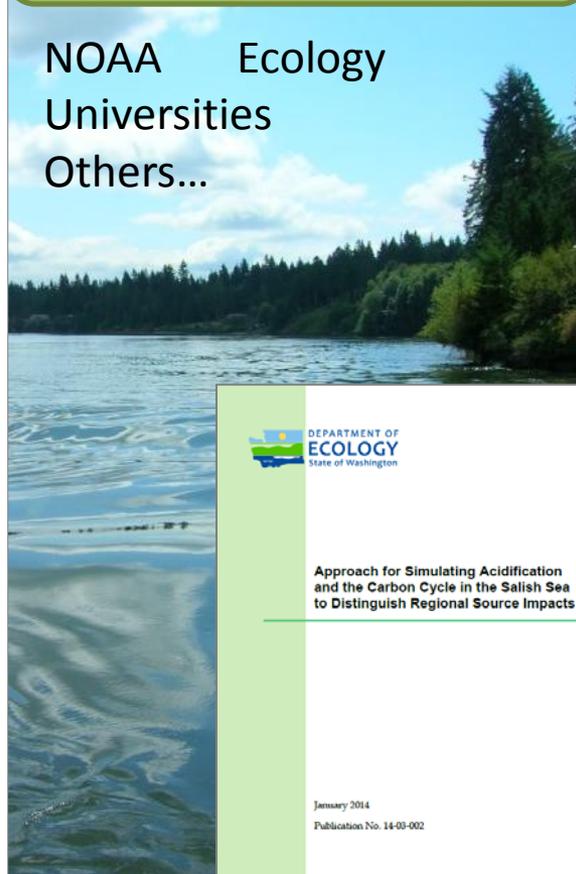
Monitoring

NOAA Ecology
DNR DFW
Universities Tribes
Local governments



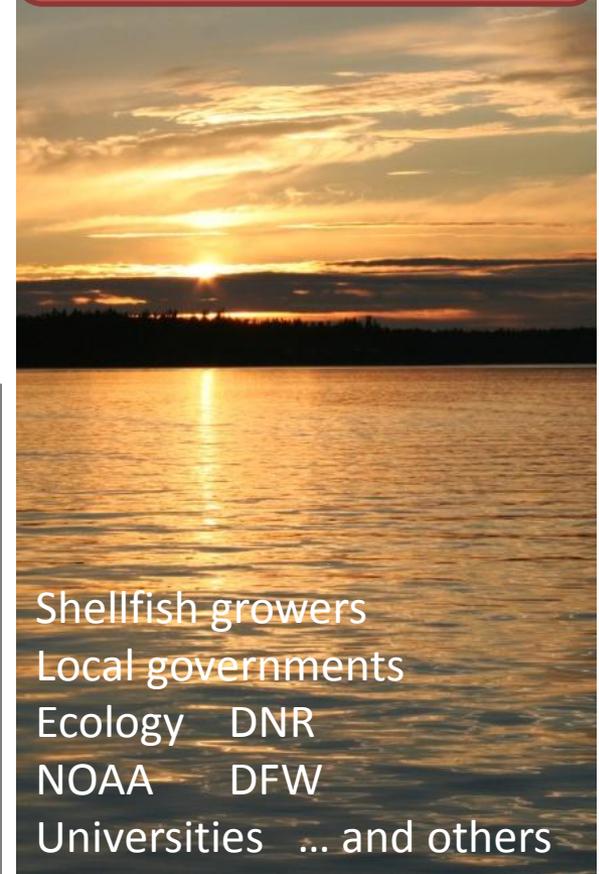
Modeling

NOAA Ecology
Universities
Others...



Management and Adaptation

Shellfish growers
Local governments
Ecology DNR
NOAA DFW
Universities ... and others



... but additional resources will be needed.

