

# Nearshore Pollution

People come from all over the world to visit Lake Tahoe and marvel at the beauty and clarity of the shoreline water. But managing the nearshore environment is a complex challenge. This illustration depicts the key pollutants, and their sources and effects on the nearshore. Uncontrollable factors, such as climate; lake circulation and mixing patterns; water temperature; and the shape, depth, and form of the nearshore also influence its condition.

## Sediments & Nutrients

Sediments suspended in water scatter and refract light, making it appear murky. Smaller sediment particles have greater scattering power and are extremely difficult to settle once they are in the water column. Nutrients are a natural part of the ecosystem, acting like fertilizers to support the growth of algae and aquatic plants that provide food and habitat for fish, shellfish, and smaller organisms that live in water. However, too many nutrients degrade water quality by stimulating excessive growth of algae and aquatic invasive plants and animals. Sediments and nutrients are derived from urban, forest and stream, and atmospheric sources.

### URBAN SOURCES

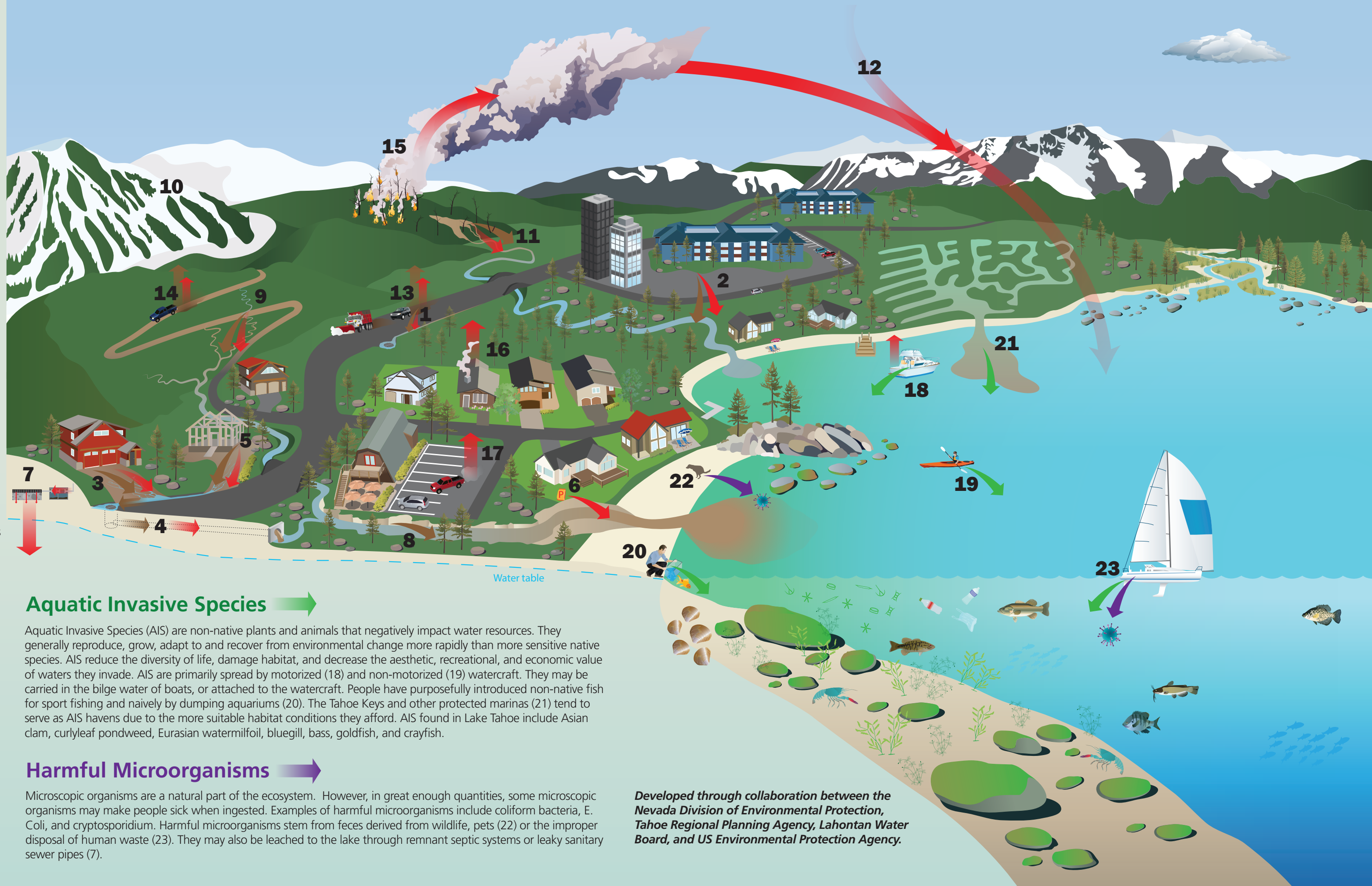
Roads are the largest specific source of urban pollutants. Vehicles grind roads, wintertime traction sands and accumulated sediments into fine particles. Roads (1) parking lots (2) and driveways (3) are impervious surfaces that prevent precipitation from soaking into the ground. Fine sediment and nutrients are carried in stormwater runoff through the storm drain network (4) to the lake or tributary streams. Bare soils on parcels or construction sites (5) also wash into the storm drain network. Fertilized turf (6), leaking sanitary sewer pipes and remnant septic systems (7) may also serve as a source of nutrients.

### FOREST & STREAM SOURCES

Erosion of stream banks and beds (8) occurs where channels have been disturbed or straightened, or where the channel has become disconnected from its floodplain. If left unmitigated, disturbed soils such as dirt roads (9), ski runs (10) and burned areas (11) can deliver sediments and nutrients in runoff.

### ATMOSPHERIC SOURCES

While a significant proportion of airborne pollutants originate outside the Lake Tahoe Basin (12), most are generated in-basin. Dust is kicked into the air by vehicles travelling on paved (13) and unpaved (14) roads and parking lots (2). Ash from wildfires (15), prescribed fire and residential woodstove smoke (16) contributes particulate matter and nutrients. Emissions from vehicles (17), boats (18) and other motorized machinery are the primary source of nitrogen.



## Aquatic Invasive Species

Aquatic Invasive Species (AIS) are non-native plants and animals that negatively impact water resources. They generally reproduce, grow, adapt to and recover from environmental change more rapidly than more sensitive native species. AIS reduce the diversity of life, damage habitat, and decrease the aesthetic, recreational, and economic value of waters they invade. AIS are primarily spread by motorized (18) and non-motorized (19) watercraft. They may be carried in the bilge water of boats, or attached to the watercraft. People have purposefully introduced non-native fish for sport fishing and naively by dumping aquariums (20). The Tahoe Keys and other protected marinas (21) tend to serve as AIS havens due to the more suitable habitat conditions they afford. AIS found in Lake Tahoe include Asian clam, curlyleaf pondweed, Eurasian watermilfoil, bluegill, bass, goldfish, and crayfish.

## Harmful Microorganisms

Microscopic organisms are a natural part of the ecosystem. However, in great enough quantities, some microscopic organisms may make people sick when ingested. Examples of harmful microorganisms include coliform bacteria, E. Coli, and cryptosporidium. Harmful microorganisms stem from feces derived from wildlife, pets (22) or the improper disposal of human waste (23). They may also be leached to the lake through remnant septic systems or leaky sanitary sewer pipes (7).

*Developed through collaboration between the Nevada Division of Environmental Protection, Tahoe Regional Planning Agency, Lahontan Water Board, and US Environmental Protection Agency.*