

January 17th, 2025
Friday Harbor

Functions and Values of Shoreline Vegetation

Friends *of the*
San Juans





Values



Conservation
value



Cultural



Economic



Recreation



Aesthetic



Climate
resilience

Functions



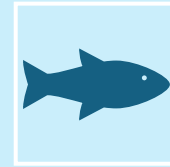
Slope stability



Erosion
Control



Nutrient
cycling



Wildlife
habitat



Flood velocity
reduction



Carbon
sequestration



Functions of Plants on Slopes

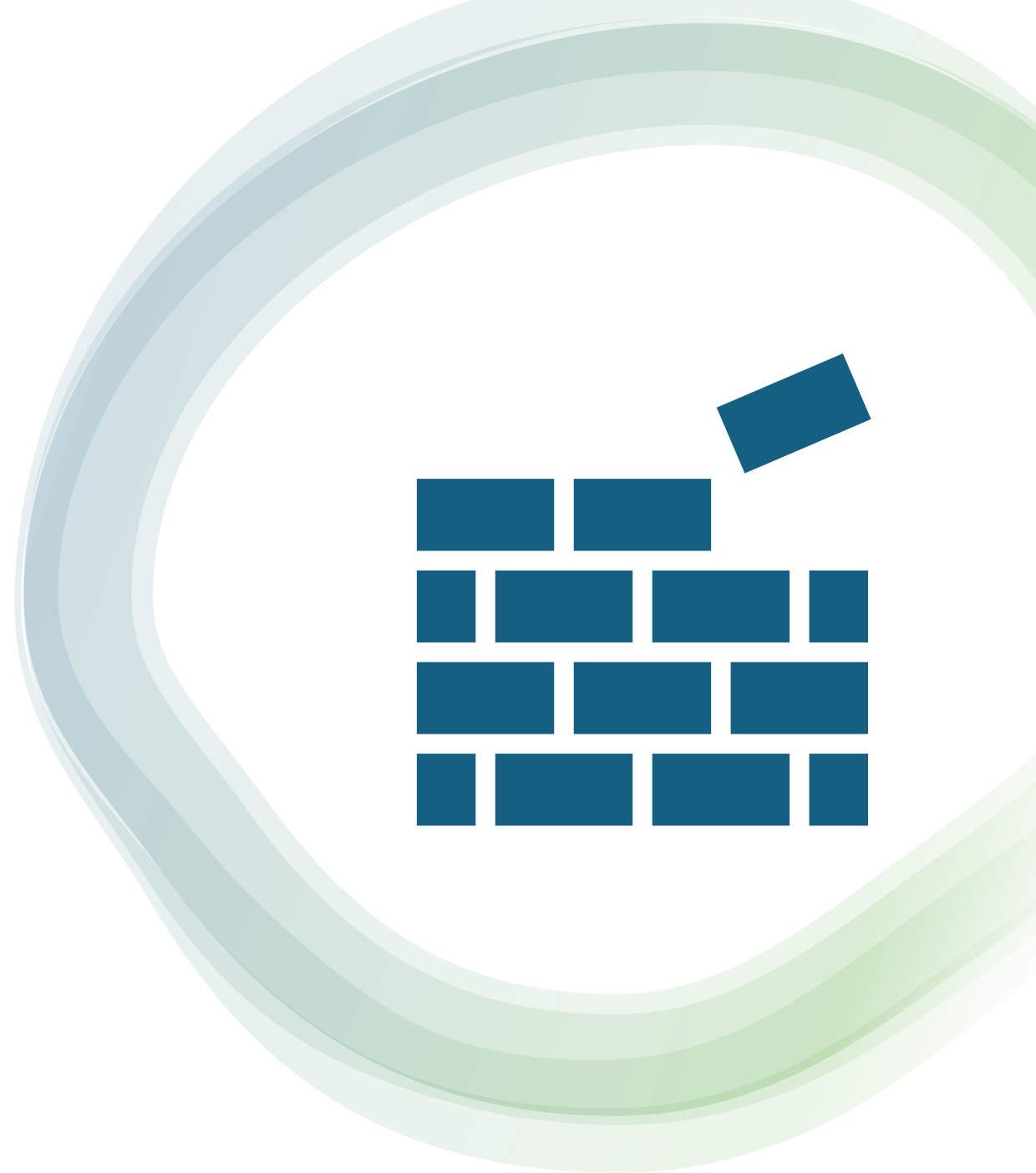


Hydraulic Functions

- Rainfall interception
- Transpiration, evapotranspiration
- Infiltration, soil pore connectivity
- Soil moisture regulation, soil moisture wicking
- Increase in soil cohesion

Mechanical Functions

- Root reinforcement
 - fine roots mesh surface
 - Structural roots increase shear strength
- Surface roughening
- Roots distribute loads across surfaces.

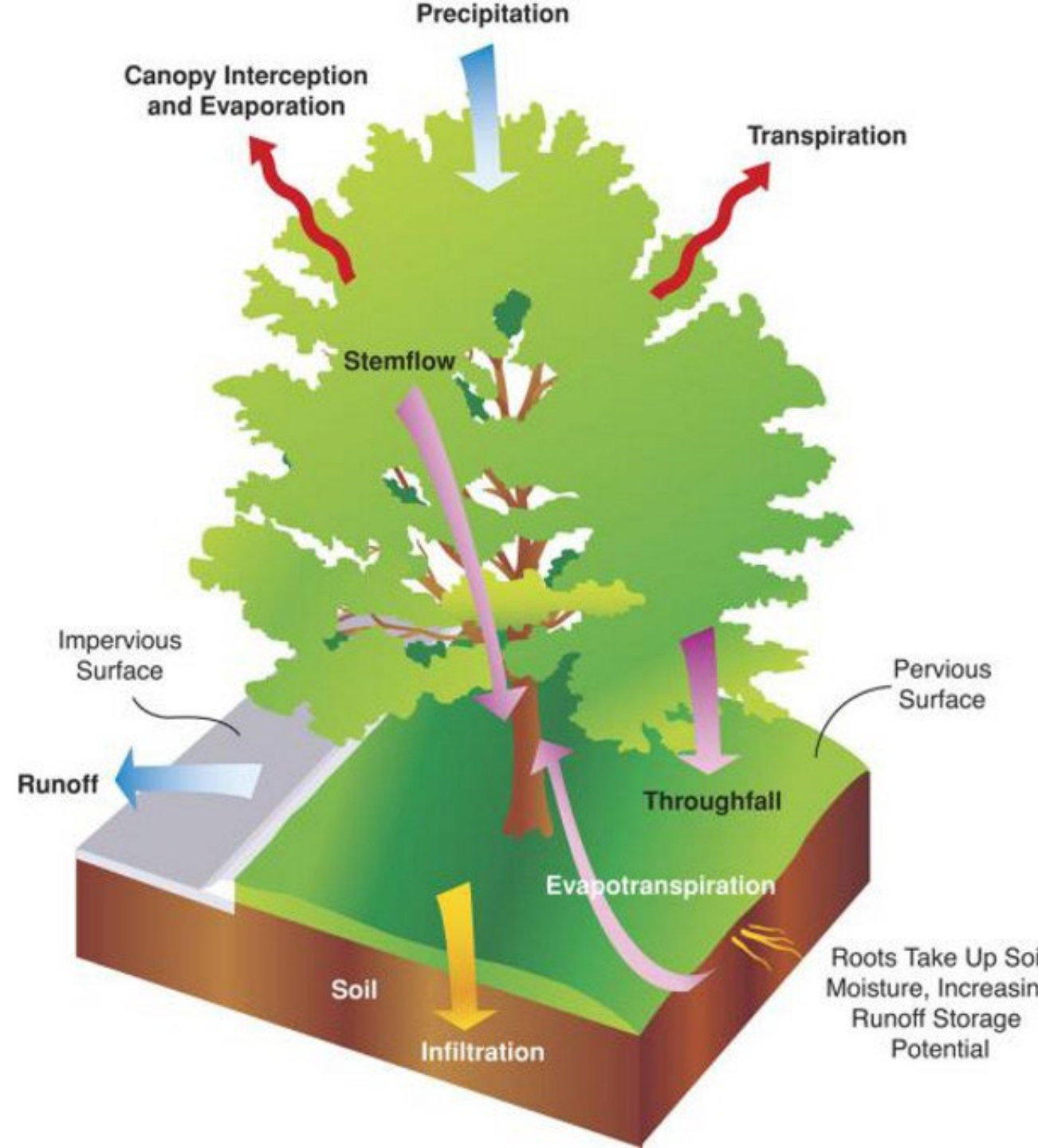


Canopy Functions

Canopy Interception and Evaporation

Transpiration (*plants*)

Evapotranspiration (*plants & soil*)



Rainwater Interception

Evergreen plants = year round

Small branches, and moss and lichen growing on deciduous trees.

In contiguous PNW forests, 20-40% of precipitation is intercepted.



Soil Functions

- Soil moisture wicking
- Detritus regulates saturation
- Soil cohesion



Root reinforcement

- Lateral support
- Anchoring support
- Resist shallow landslides, resist against gravity-induced movement



Real tree roots.

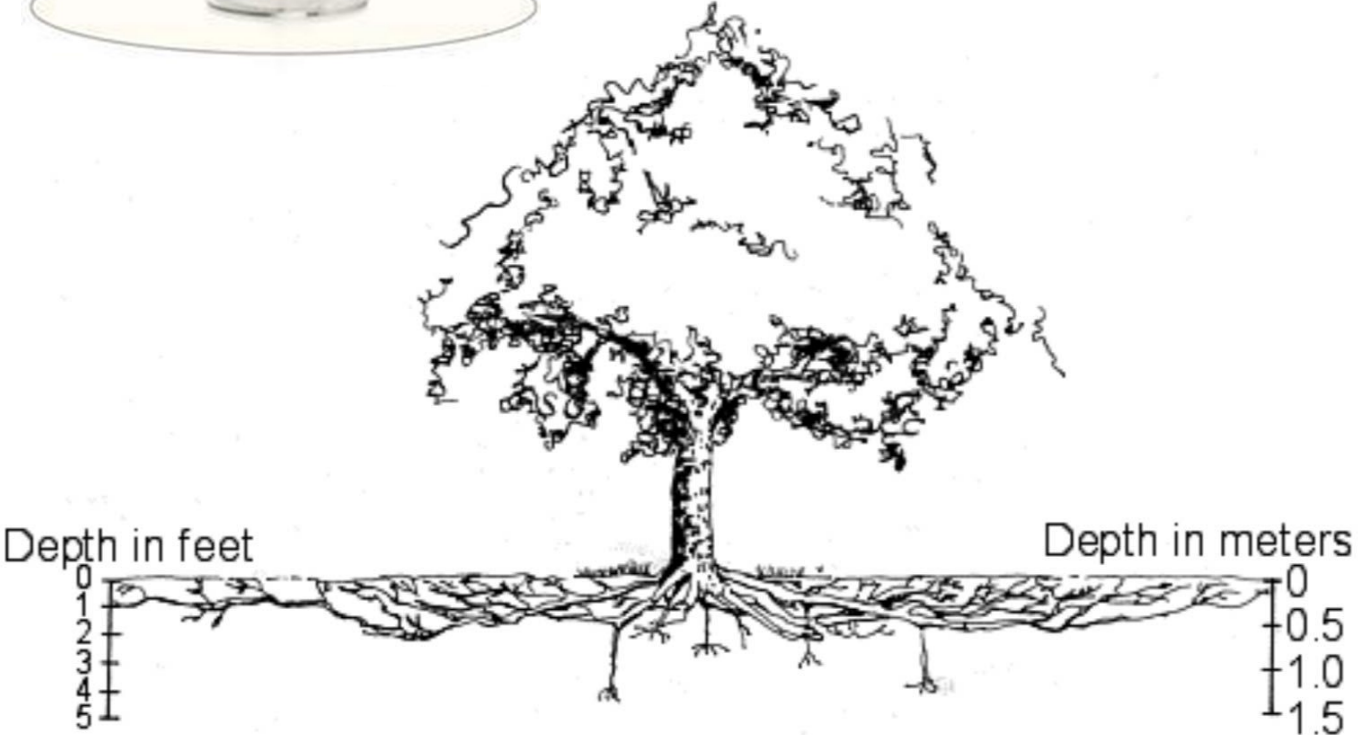
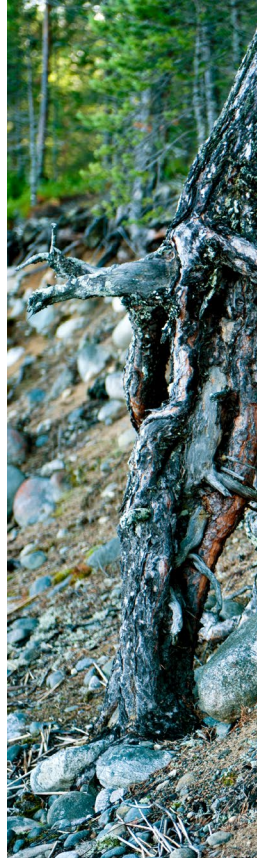


Figure 1. Diagram of a 'typical' root system



Ro

oils



Surface roughening

- Slows velocity of sheetflow
- Mulch, natural detritus
- Grass and ground cover



A wide-angle photograph of a rocky shoreline. The foreground is dominated by dark, wet rocks and seaweed. In the middle ground, a large, light-colored rock face or landslide slope rises from the shore. The background is a dense forest of tall evergreen trees under a clear sky. The text "Other Functions of Plants on Shorelines" is overlaid in white, bold font across the center of the image.

Other Functions of Plants on Shorelines

Wildlife

Retain what can be retained.



Beach wrack – essential for food web

**Leave the
Wrack, It's
Nature's Snack**

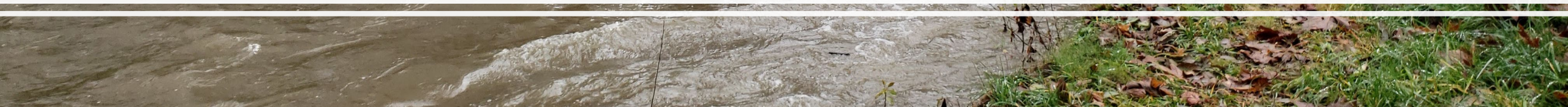




Living and dead riparian
vegetation and LWD at toe of
slope acts like mangrove.



Don't forget about the hardwoods.



Flood Velocity and Quantity

- Vegetation slows floodwater
- Infiltrates, acts like sponge
- Reduce beach coarsening,
clings to sediment



Recap

- **Shoreline vegetation plays crucial roles in Puget Sound ecosystem**
- **Mature evergreen vegetation provides the most hydraulic and mechanical function to slopes.**
- **Deciduous trees still have essential for wildlife, nutrient cycling, soil.**
- **Retain marine riparian buffer.**
- **Remove only what is necessary.**



Mass Movements

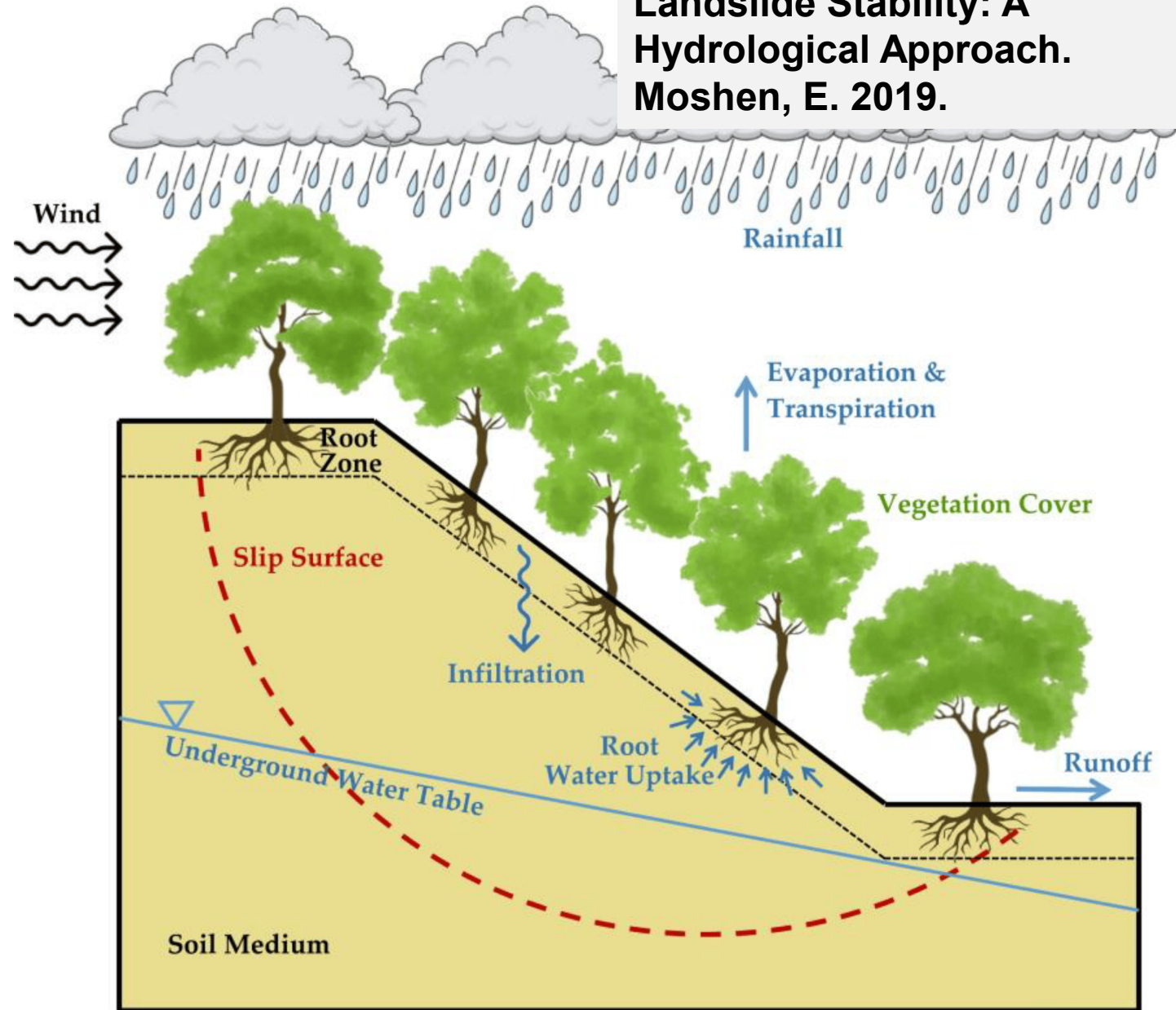
Deep-seated
Rotational
Slumps
Flows

Root reinforcement can be negligible where prone to mass movements.

Hydraulic benefits are still significant.

geologyportal.dnr.wa.gov

A Modeling Platform for
Landslide Stability: A
Hydrological Approach.
Moshen, E. 2019.





PENINSULA
ENVIRONMENTAL

Questions?

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