

Identifying Priority Sites for Rain Gardens in Lower Puyallup River Watershed



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BACKGROUND

Green Stormwater Infrastructure

- intercepts stormwater runoff that carries pollutants (toxic chemicals, sediment)
- enhances infiltration, ET, and reuse of water
- types: rain garden, bioretention system, permeable pavement

Rain Garden

- small-scale GSI (Fig 1)
- suitable for yards and sidewalks
- captures and treats pollutants in stormwater runoff

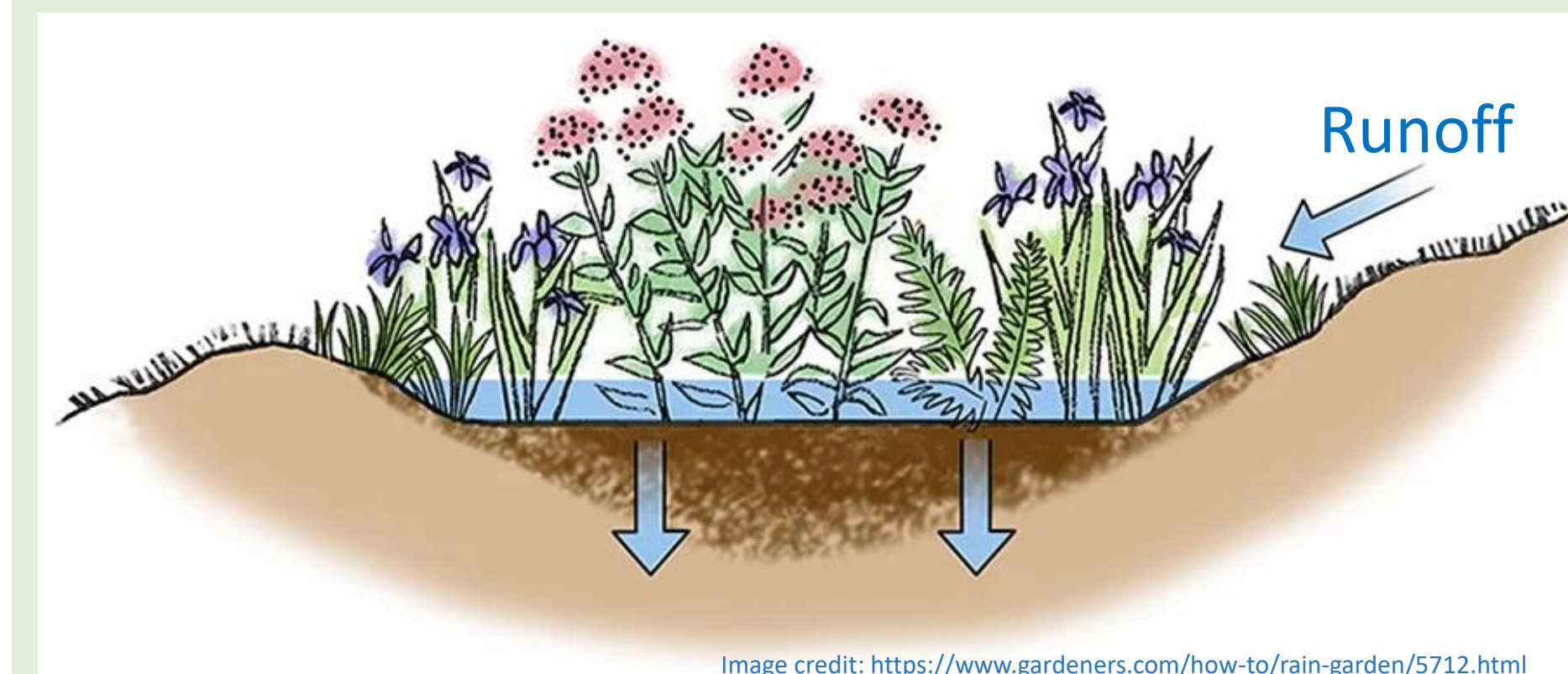


Fig. 1. Example of rain garden

Hydrologic Sensitivity Index (HSI) Method

- based on slope, contributing area, hydraulic conductivity, and soil depth to identify saturation-prone area

OBJECTIVE

- adapt the HSI method to identify priority sites for rain gardens in an urbanizing watershed in South Puget Sound

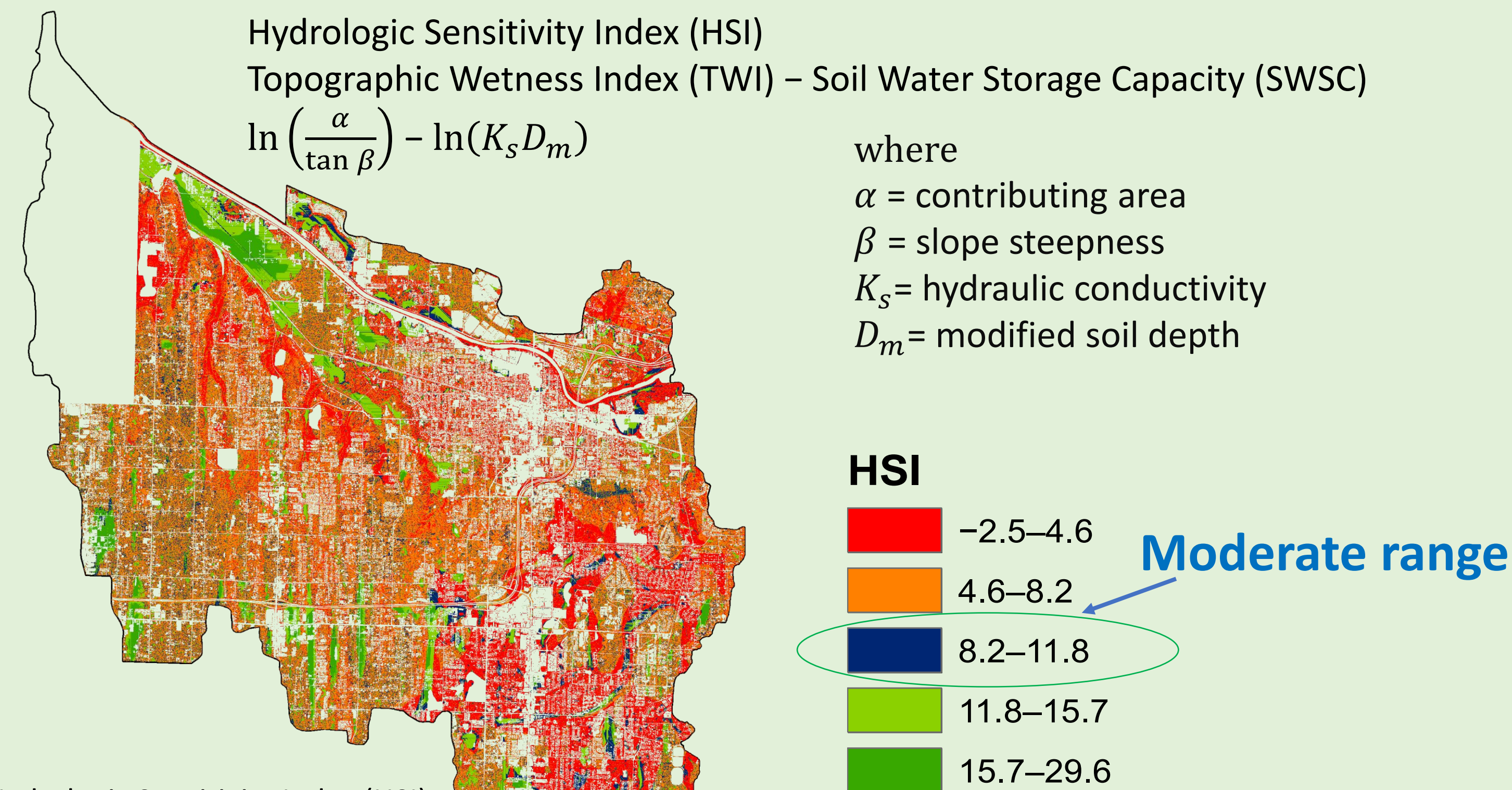


Fig. 2. Hydrologic Sensitivity Index (HSI)

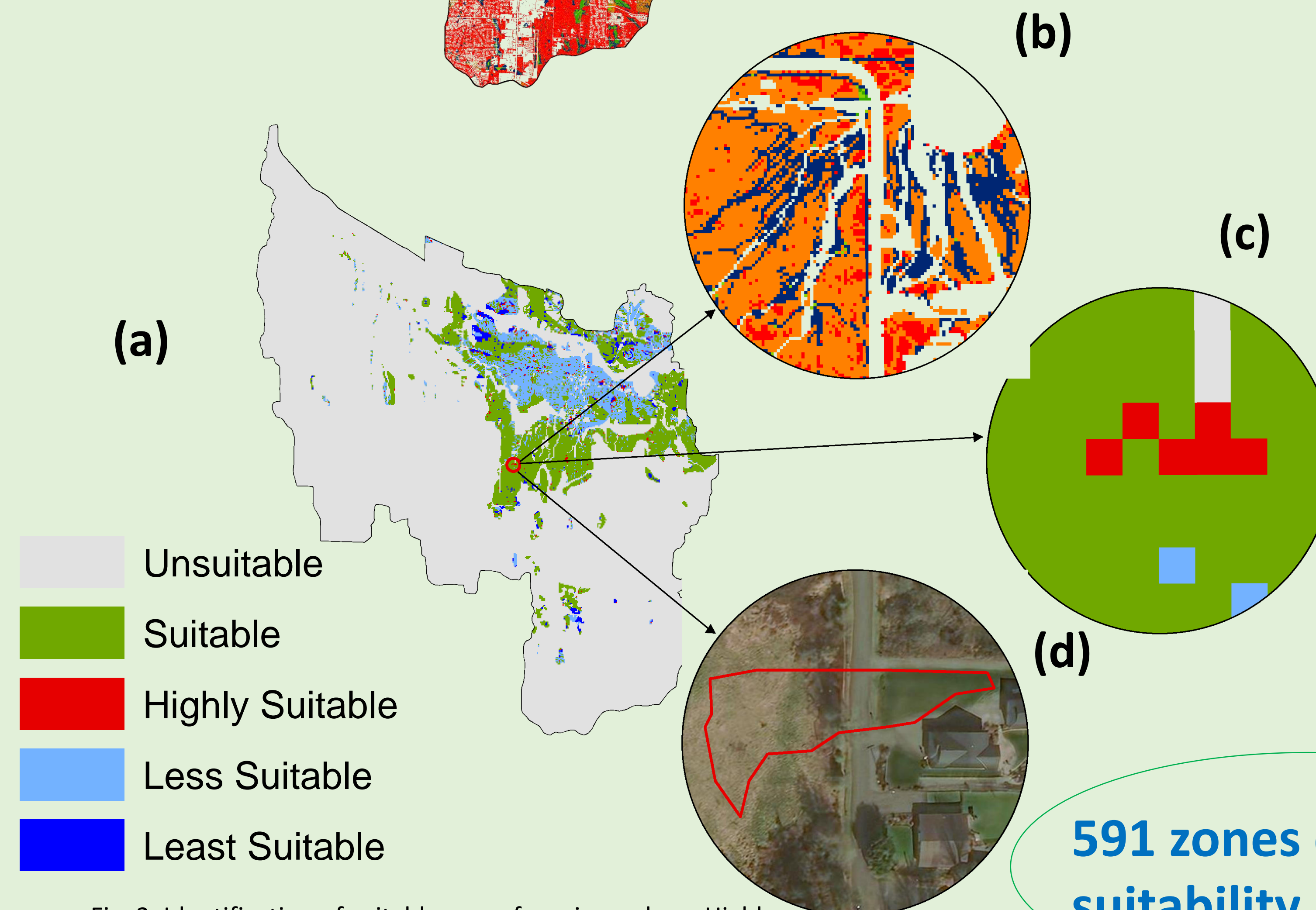


Fig. 3. Identification of suitable areas for rain gardens. Highly suitable sites (c) fall into the area in (d, red polygon)

METHODS

- compute HSI (Fig 2, 3b)
- filter out unsuitable areas: erosion hazard areas, wetlands, parks (Fig 3a)
- identify suitable sites for rain gardens based on HSI values and “fishnet” zoning (Fig 3c,d)

High HSI Values ❌

- large TWI and small SWSC
- greater proclivity of saturation-excess runoff
- not suitable to store stormwater runoff

Low HSI Values ❌

- relatively small contributing area
- likely large soil hydraulic conductivity and depth
- unlikely to be a source of stormwater runoff

Moderate HSI Values ✅

- moderate to large TWI and small to moderate SWSC
- moderate proclivity of saturation-excess runoff
- most suitable for rain gardens