



Understanding & Restoring Floodplains

Workshop Overview

Introduction (Ellen)

- objectives of workshop
- overview of concepts

Floodplain Characterization (Ryan, Rich, Alex, Emily)

- remote floodplain delineation
- delineation of artificial features & assessment of connectivity
- quantification of floodplain spatial heterogeneity

Workshop Overview

Floodplain Functions (Dan, Katherine)

- energy dissipation & storage of sediment, large wood, & organic carbon

Floodplain Restoration (Juli, Sarah)

- beaver-related restoration
- Stage 0 restoration

Introduction

Floodplain

geomorphic definition: a relatively flat alluvial surface adjacent to the channel that is inundated at least periodically by flows of the contemporary hydrologic regime & is composed of river-deposited sediment (boundary can be 'fuzzy' because floodplain surfaces are formed over longer time periods & a range of flow magnitudes)

regulatory definition: defined based on inundation frequency (e.g., 100-year floodplain)

River corridor: active channel(s), floodplain, & underlying hyporheic zone

We proceed from the premise that the primary objective of floodplain management & restoration is to maintain and enhance floodplain functions and resilience.

Resilience: ability to absorb disturbances (natural or human-caused) without diminishing or changing floodplain functions

Floodplain Functions

1) Storage

- surface & subsurface water
- solutes
- sediment
- particulate organic matter
- large wood
- (contaminants)

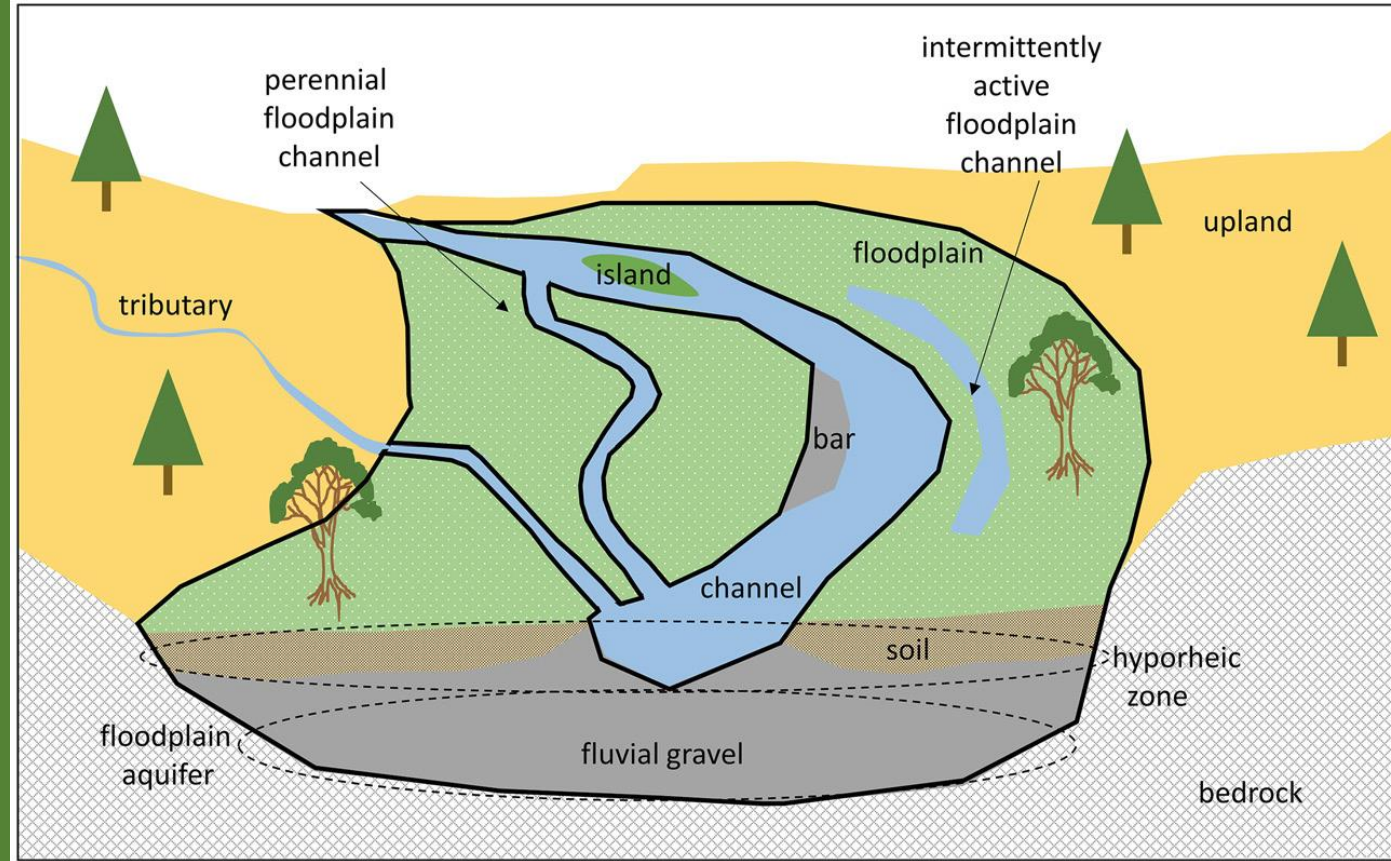


Fig. 4. Floodplain control volume, outlined in solid black lines

Reviews of Geophysics

REVIEW ARTICLE

10.1029/2020RG000724

An Integrative Conceptualization of Floodplain Storage

Ellen Wohl¹ 

2021

Floodplain Functions

2) Biogeochemical reactions

- surface & subsurface environments
- N, P

3) Habitat & biota

- habitat abundance & diversity
- biomass & biodiversity

Characteristics that Promote Floodplain Functions & Resilience

- Physical integrity: a set of active river processes & landforms wherein the river corridor maintains a dynamic equilibrium, with adjustments not exceeding limits of change defined by societal values (*Graf, 2001, Annals Assoc. Am. Geographers*)
- Ecological integrity: the ability of an ecosystem to support & maintain a community of organisms that has species composition, diversity, & functional organization comparable to those of natural habitats within a region

Characteristics that Promote Floodplain Functions & Resilience

- Natural range of variability: the ecological conditions, & the spatial & temporal variation in these conditions, that are relatively unaffected by people, within a period of time & geographical area appropriate to an expressed goal (*Landres et al., 1999, Ecological Applications*)
 - temporal
 - spatial

Characteristics that Promote Floodplain Functions & Resilience

- 3D Connectivity

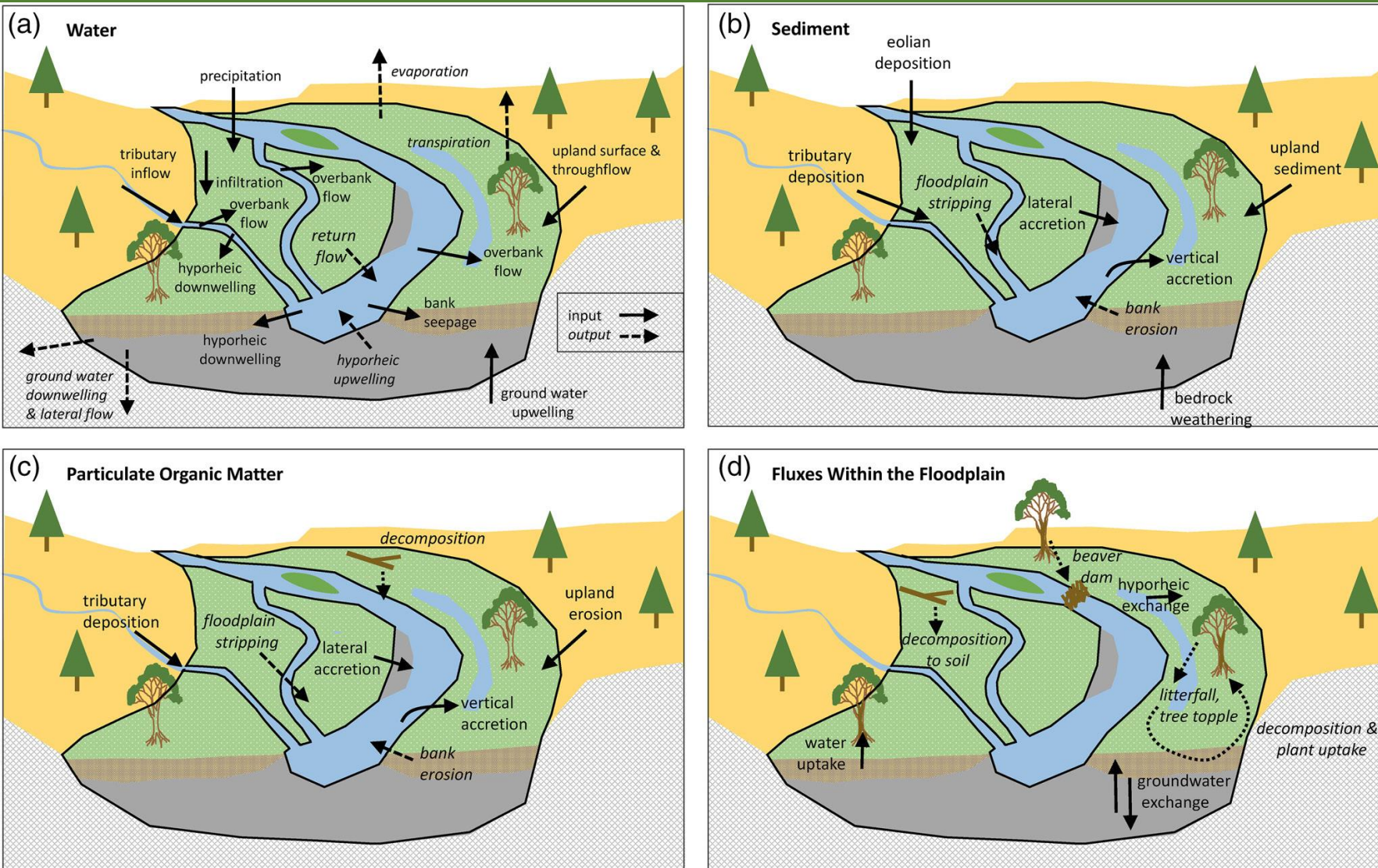
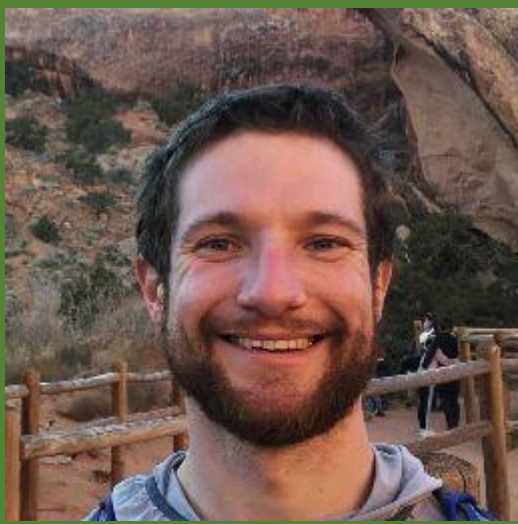


Fig. 5. Schematic illustration of processes creating exchanges between floodplain control volume & adjacent areas



Dan Scott



Katherine Lininger



Alex Brooks



Emily Iskin



Sarah Hinshaw



Ryan Morrison



Rich Knox



Juli Scamardo

