



The Ecology of a Flood Plain Formation and its Importance

Yu Zhang*

Department of Spatial Information Technology Application Research, Changjiang River Scientific Research Institute, Wuhan, China

DESCRIPTION

A floodplain, also known as a flood plain or bottomlands is an area of land adjacent to a river that stretches from the banks of its channel to the foot of the enclosing valley walls and is prone to flooding during high discharge periods. Clays, silts, sands, and gravels are commonly found in the soils, which were formed during floods.

Floodplains often have high soil fertility due to the constant flooding of floodplains, which can deposit nutrients and water; some key agricultural regions, such as the Mississippi river basin and the Nile, rely largely on floodplains. Because of the availability of water and high-quality soil, agricultural and urban settlements have grown near or on flood plains. However, the threat of floods has prompted more flood-control efforts.

Deposition on the inside of river bends and overbank flow produce the majority of floodplains. The flowing water erodes the river bank on the outside of the meander wherever it meanders, while sediments are deposited in a point bar on the inside of the meander. The deposition builds the point bar laterally into the river channel, which is referred to as lateral accretion. Erosion on the outside of the meander usually counteracts deposition on the inside, causing the channel to shift in the meander's direction without changing considerably in width.

Flooding causes an alluvial ridge to form, which can rise considerably above the floodplain, with natural levees and abandoned meander loops. A channel belt, produced by numerous generations of channel migration and meander cutoff, sits atop the alluvial ridge. The river may quit the channel belt and begin creating a new channel belt at a different location on the floodplain at significantly longer intervals. Avulsion is the name for this process, which occurs every 10–1000 years.

Floodplains can form around any river, regardless of its size or type. Even extremely straight river sections have been discovered to produce floodplains. Mid-channel bars in braided rivers travel downstream in the same way as point bars in meandering rivers do, and they can form a floodplain. The amount of silt in a floodplain far outnumbers the amount of sediment carried by

ivers. As a result, floodplains serve as key storage sites for sediments as they travel from their source to their final depositional habitat. The river is considered to have abandoned its floodplain when the rate at which it is cutting downwards becomes large enough that overbank flows become infrequent, and portions of the abandoned floodplain may be retained as fluvial terraces.

Floodplain ecosystems are diverse and productive. They are marked by significant spatial and temporal variety, resulting in some of the most species-rich environments. The flood pulse associated with annual floods is the most characteristic aspect of floodplains from an ecological standpoint, hence the floodplain ecosystem is defined as the area of the river valley that is periodically inundated and dried.

Floods bring in nutrient-rich detritus and, as the soil is wet, nutrients are released from the dry soil. The nutrient supply is supplemented by the breakdown of terrestrial plants drowned by floodwaters. Fish spawning season generally coincides with the commencement of flooding because the flooded littoral zone of the river (the zone closest to the river bank) provides an excellent setting for many aquatic species. To survive the ensuing dip in water level, fish must develop swiftly during the flood. As the floodwaters recede, microorganisms thrive in the littoral, while the riverbanks dry out and terrestrial plants grow to sustain the bank.

The floodplains have high yearly growth and death rates, which allows extensive parts of the floodplain to be colonized quickly. This enables them to benefit from changing floodplain geometry. Floodplain trees, for example, are fast-growing and tolerant of root disturbance. The abundant food supply given by the flood pulse attracts opportunists (such as birds). Transportation and trash disposal have negative consequences as well. As a result, these ecosystems are fragmented, resulting in population and diversity loss and putting the remaining ecological fragments in jeopardy. Flood management reduces physical variety by creating a stronger barrier between water and land than in undisturbed floodplains. Floodplain woods protect streams from erosion and pollution while also reducing flood damage.

Correspondence to: Yu Zhang, Department of Spatial Information Technology Application Research, Changjiang River Scientific Research Institute, Wuhan, China, Email: yuzhang@gmail.com

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