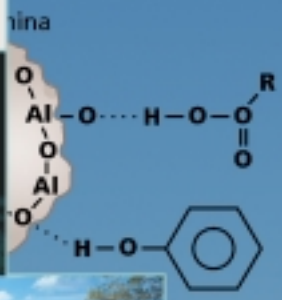
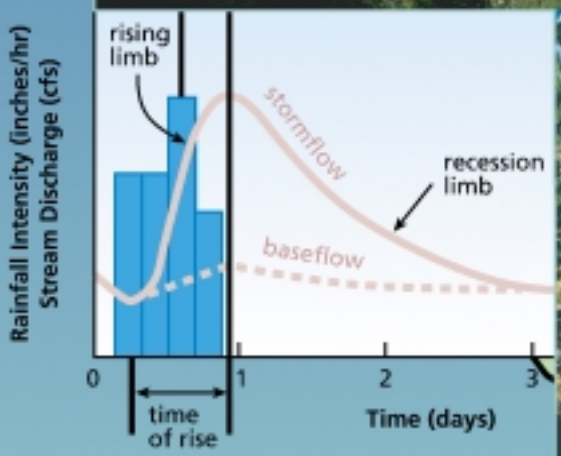
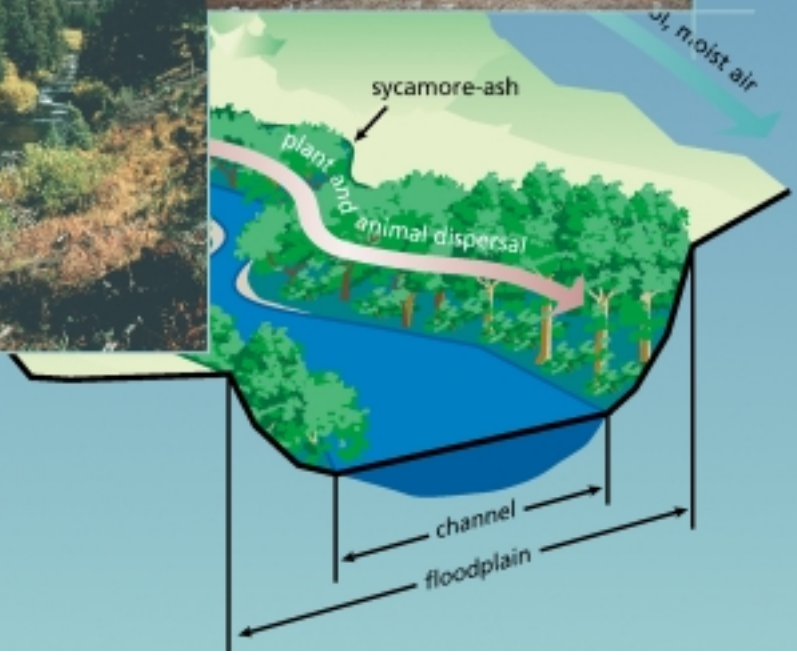
Part I

Background







Background

Chapter 1: Overview of Stream Corridors

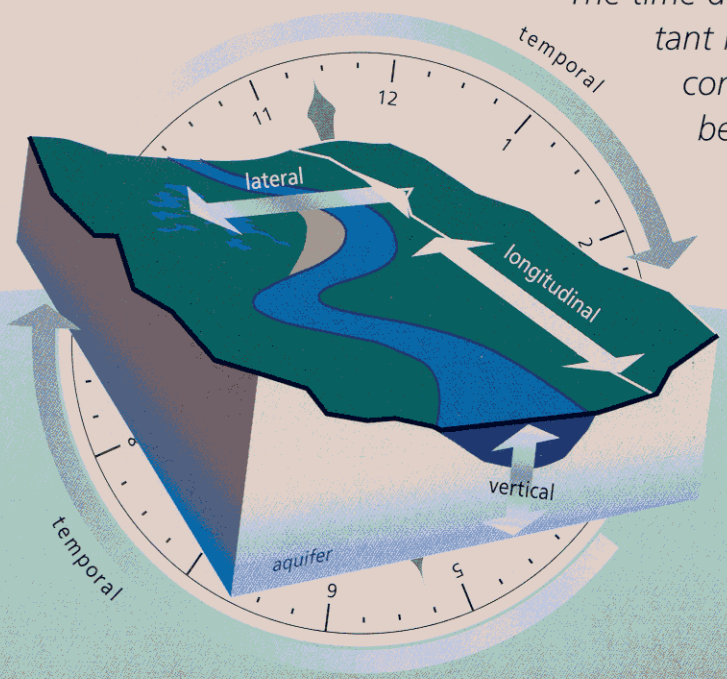
Chapter 2: Stream Corridor Processes, Characteristics, and Functions

Chapter 3: Disturbance Affecting Stream Corridors

The purpose of Part I is to provide background on fundamental concepts necessary for planning and designing stream corridor restoration. Ward (1989) described relationships that occur in the stream corridor using a four-dimensional framework (see figure below). This framework serves as a good starting point for examining stream corridors.

Untrained observers typically focus on only the longitudinal dimension of the framework—the stream as it flows from headwaters to mouth. This perspective is limited, however, because lateral and vertical movements of water, materials, energy, and organisms also influence the character of the stream corridor.

The time dimension is also critically important because stream corridors are constantly changing. Changes can be detected in any number of time frames—from minutes to millennia. A challenge for restoration practitioners,

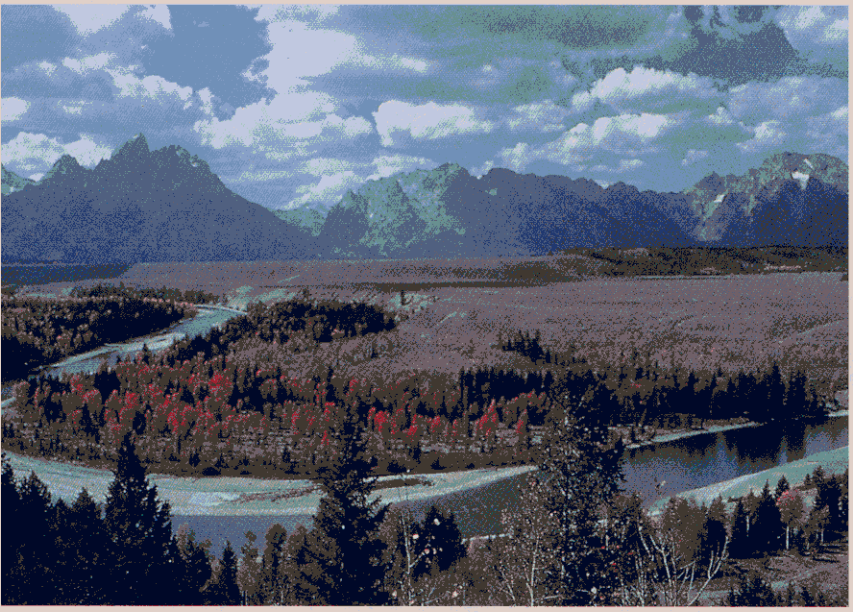


Dimensions of the stream corridor. A four-dimensional framework serves as a good starting point for examining stream corridors.

therefore, is to view time as well as space in the stream corridor.

The physical structure of the stream corridor is formed by the movement of water, materials, energy, and organisms within this multidimensional framework. As movement affects structure, so too does structure affect movement. This natural feedback loop helps to create a state of balance within the stream corridor known as dynamic equilibrium, which allows the corridor to accommodate limited change while maintaining its essential structure and functions.

Disturbances that affect stream corridors can be natural or human-induced. If they are severe enough, they can alter the structure and functions of a stream corridor to a point that dynamic equilibrium is disrupted. Restoration can then be employed to try to reestablish structure and functions so natural dynamic equilibrium can once again occur.



The care of the rivers is not a question of the rivers but of the human heart.

—Tanaka Shozo

Part I is composed of three chapters:

- ***Chapter 1*** *defines the components of the stream corridor and introduces the concepts of scale and structure. With these concepts in mind, structural elements within the stream corridor are examined first in the lateral and then in the longitudinal dimensions.*
- ***Chapter 2*** *presents information on the hydrologic and geomorphic processes that help build structure in the stream corridor. Also addressed are the chemical and biological characteristics that make a stream corridor unique in the landscape. The chapter concludes with a discussion of the six critical functions of the stream corridor ecosystem and introduces the concept of dynamic equilibrium.*
- ***Chapter 3*** *summarizes the range of disturbances that can stress the stream corridor ecosystem, impact dynamic equilibrium, and impair the corridor's ability to perform critical functions. Both natural and human-induced disturbances are discussed with a special emphasis on land use activities.*

The background information presented in Part I will be applied both in restoration planning (Part II) and plan implementation (Part III).