

How Does a River Work? A Virtual Stream Table Presentation

JARON CONDLEY, ENVIRONMENTAL SCIENTIST I

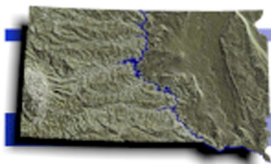
GEOLOGICAL SURVEY PROGRAM

SD DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

(605) 677-6152

AKELEY-LAWRENCE SCIENCE CENTER

VERMILLION, SD 57069



South Dakota
Department of Environment
& Natural Resources
Geological Survey



DENR
SOUTH DAKOTA



INTRODUCTION

- WHAT IS A STREAM TABLE?
- WHAT ARE THE THREE MAIN TYPES OF RIVERS?
- WHAT TYPES OF RIVERS ARE IN SOUTH DAKOTA?
- WHAT ARE THE KEY FEATURES AND PROCESSES OF RIVERS?
- HOW DOES AN OXBOW LAKE FORM?
- WHAT ARE THE DIFFERENT WAYS THAT WE CAN STABILIZE RIVER SYSTEMS?

KEY VOCABULARY

- RIVERS/STREAMS
- UPLANDS RIVER
- MEANDERING RIVER
- BRAIDED RIVER
- CHANNEL
- THALWEG
- EROSION
- DEPOSITION
- GRAIN-SIZE
- OXBOW LAKE
- CUT-BANK
- POINT BAR
- MEANDERING
- DELTA
- STABILIZATION
- LEVEES
- DAMS

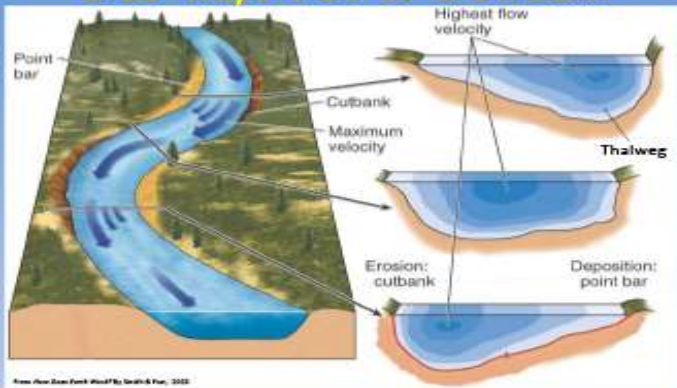
The Missouri River is both a meandering and braided river.



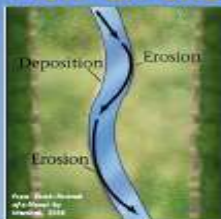
Goat Island, Near
Vermillion, SD

HOW DOES A RIVER WORK?

Side-ways view of a stream:



How an oxbow lake forms:



Stage 1
 •Early river development
 •Nearly straight
 •Very few meanders



Stage 2
 •More sinuosity
 •Development of Point Bars and Cut Banks



Stage 3
 •High sinuosity
 •Meander neck begins to develop



Stage 4
 •Meander neck becomes a cutoff point
 •Oxbow Lake is formed

Which stream feature is the oldest?



This is the Big Sioux River near Jefferson, SD. Notice the different oxbows.

How are river banks stabilized?

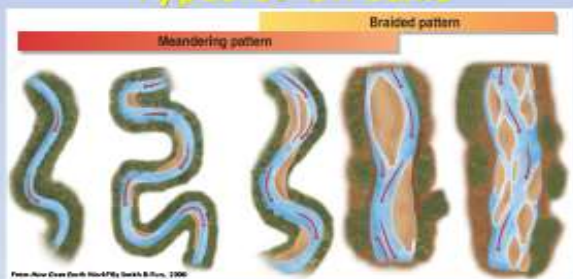
Humans stabilize banks by piling rocks along the channel.



Nature stabilizes banks by vegetation growth. Roots in the soil make the bank sturdy.



Types of streams



Note how the Missouri can have more than one type of channel.

Point Bar- A low, curved ridge of sand and gravel deposited along the inner bank of a meandering stream.

Cut Bank- A steep slope formed on the outside of a meander by erosion.

Meander- a bend in a sinuous waterway. A meander develops through the erosion of sediment from a cut bank and the deposition of sediment on a point bar.

Sinuosity- a measurement of the curvature of the stream channel

Thalweg- the deepest part of the river channel where water moves the fastest