### Module 2 Narration – What is a watershed?

<table>
<thead>
<tr>
<th>Timing Key</th>
<th>Narrative</th>
<th>Snapshots</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 00:10</td>
<td><strong>Every living thing relies on water to exist. But where does our water come from?</strong> The most natural place to look is upstream to your watershed.</td>
<td>Video of Verde River Valley fades in…..w/ running antelope, stream shot</td>
</tr>
<tr>
<td>b) 00:18</td>
<td><strong>Watersheds or water basins come in all shapes and sizes.</strong> The largest watersheds stretch from the tallest mountains to the far off oceans. You can find them at many scales, from a small hillslope to an area the size of the Amazon, the largest watershed on Earth.</td>
<td></td>
</tr>
<tr>
<td>c) 00:29</td>
<td>The surface of the land is divided up into watersheds. If you imagine cutting up a map of the United States to make a jigsaw puzzle, you will get the right idea. All the watersheds fit right next to each other, just like the interlocking pieces of a huge jigsaw puzzle. The entire United States, and the whole world for that matter, is made up of many watersheds that lie right <strong>beside</strong> each other, so that everything –</td>
<td>Jigsaw US watershed map appears – Tim use: n_america.tif</td>
</tr>
<tr>
<td>d) 00:17</td>
<td><strong>Pause between each one</strong> Homes, farms, forests, deserts, small towns, big cities are all inside a watershed. <strong>Parade of photos fade in/out. Video?</strong></td>
<td></td>
</tr>
</tbody>
</table>
e) 00:14 All the water that falls within one watershed drains downhill into a particular river, lake or other body of water. 

Pause

Let’s use a model of the San Francisco Peaks in Arizona to explain how a watershed works.

f) 00:28 Each individual watershed is like a bathtub, with ridges for a rim and a network of channels leading to a drain.

The outer edge of a watershed follows what is called a *drainage divide*. A drainage divide is formed by the *ridge lines* that connect all the high points of land around the edge of the ‘bathtub’.

Highlight high points – then connect ridgelines

Inside of this divide, all water that falls, will flow down and drain into the largest stream in that watershed.

Animate arrows moving down to drainage channel

g) 00:15 The drainage divide of one bathtub, or watershed, is the edge of the neighboring watershed. Where the water goes is determined by the drainage divide. Rain that falls directly on the divide will either go one way or the other.

Red & yellow arrows point into adjacent basins

h) 00:06 not used We have all heard about the Amazon River, in South America, which drains from the high Andes on the left to the Atlantic ocean on the right.

Fade in Amazon watershed on South America map, with label.
i) 00:10  
All the precipitation that falls between the Rocky Mountains in the west and the Appalachian Mountains in the east flows toward the Mississippi River, which empties into the Gulf of Mexico.

j) 00:20  
These two maps are the same scale – compare the size of the Amazon watershed with the size of the Mississippi watershed.

The size or area of any watershed and its climate determines how much water it can collect. Do you know why the flow of the Amazon river is so much greater than the flow of the Mississippi?

pause for 5 sec  
Re label relative sizes:
Amazon: 3.4 million mi$^2$; Flow: 6.35 million cfs
Mississippi: 1.2 million mi$^2$; Flow: 0.62 million cfs

k) 00:04  
Another large watershed in North America is the Colorado River watershed.

Fade away Amazon map.  Enlarge N Am map to full-screen.
l) 00:15
The red line on the map is the continental divide. The continental divide is made up by the ridges and peaks of the Rocky Mountains. It is the drainage divide which physically separates the Mississippi and Colorado River watersheds.

Fade in Colorado watershed next to Mississippi on N Am map.

→Tim use: continent_divide.tif; Colorado_ws1.tif

m) 00:10
Let's take a closer look at the Colorado River watershed. Notice how the watershed includes portions of seven states, as well as part of northern Mexico.

Pan over to Colorado watershed and zoom in.

→Tim use: colorado_ws2.tif

While in general, water in the Colorado River watershed flows from north to south, several streams and rivers in the watershed flow from south to north or east to west. The important idea is that all water flows downhill to the Gulf of California.
n) 00:10

Fade to non-topo view.

→Tim use: colorado_ws3.tif

Large watersheds contain smaller sections called *sub-watersheds*. Sub-watersheds are named after the major river flowing through that area.

**Boundary of Verde River watershed appears within Colorado watershed – drainage network disappears.**

→Tim use: colorado_ws_and_verde.tif

---

o) 00:18

Here is the Verde River watershed, which is the focus of this video. It is a sub-watershed of the Colorado River watershed.

As you can see, the Colorado River watershed is 40 times larger than the Verde watershed, which covers about 6,200 mi².

**Zoom closer and isolate Verde watershed.**

→Tim use: verde1.tif
Adjacent to the Verde are five other sub-watershed in Southern Arizona that contribute flow to the Salt or Gila rivers in Phoenix. All these watersheds are within the larger Colorado River watershed.

Water in the Verde watershed flows downhill to the Gila River, where it continues toward the Colorado River.

Use 2 arrows or markers to show water flow from Verde down to the Salt River, and to the Gila River.

Shift to see sub-watersheds in context with map of southwest.

→Tim use: colorado_verde_mexico1.tif

Lets zoom into the Verde River watershed, which is the area we flew over during the introduction to this series. The Verde River flows from north to south, where it joins the Salt River near Phoenix, AZ.

Fade in next map. Boundaries of Salt, Gila and San Pedro watersheds appear – all with labels.

Historically, it has contributed 490,000 acre-feet annually to the flow of the Colorado River or 3% of its flow at Lees Ferry.

→Tim use: verde_and_tributaries.tif
Prior to modern times, rain and snowmelt that collected in the Verde watershed eventually flowed into the Salt River which, after joining the Gila River, ultimately reached across Arizona to the Colorado River. The Colorado River then finished the journey by emptying into the Gulf of California, in what is now Mexico. So historically, snowmelt from the peaks of central Arizona ended up in a tropical ocean. Slight pause. Now modern demand for water in Arizona prevents the Gila River from flowing all the way to the Colorado.

Show with 4 arrows the water flow down the Gila to the Colorado to Mexico to the Sea of Cortez. Fade the arrows with time.

Label the Gulf of California.
Colorado watershed boundary appears.

Large watersheds often cross county, state, and even international boundaries. Some early geographers used rivers as borders, such as here between California and Arizona. But when each state or nation has different concerns, policies and laws governing water use and quality, then conflicts can arise.

Shift & zoom to focus on Verde River watershed.
Fade in photos / videos of Verde River valley / streams.

Verde is the Spanish word for green. The river was given this name for the lush vegetation in the canyon that stands out from the surrounding desert landscape. The Verde River watershed is unique for Arizona in that it still contains a perennial stream — that is, one that flows year-round. These persistent flows support a high diversity of plants and wildlife and are an irreplaceable Arizona resource. So watersheds are important for the water and habitat they provide.

Add Gila trout picture. Video footage?