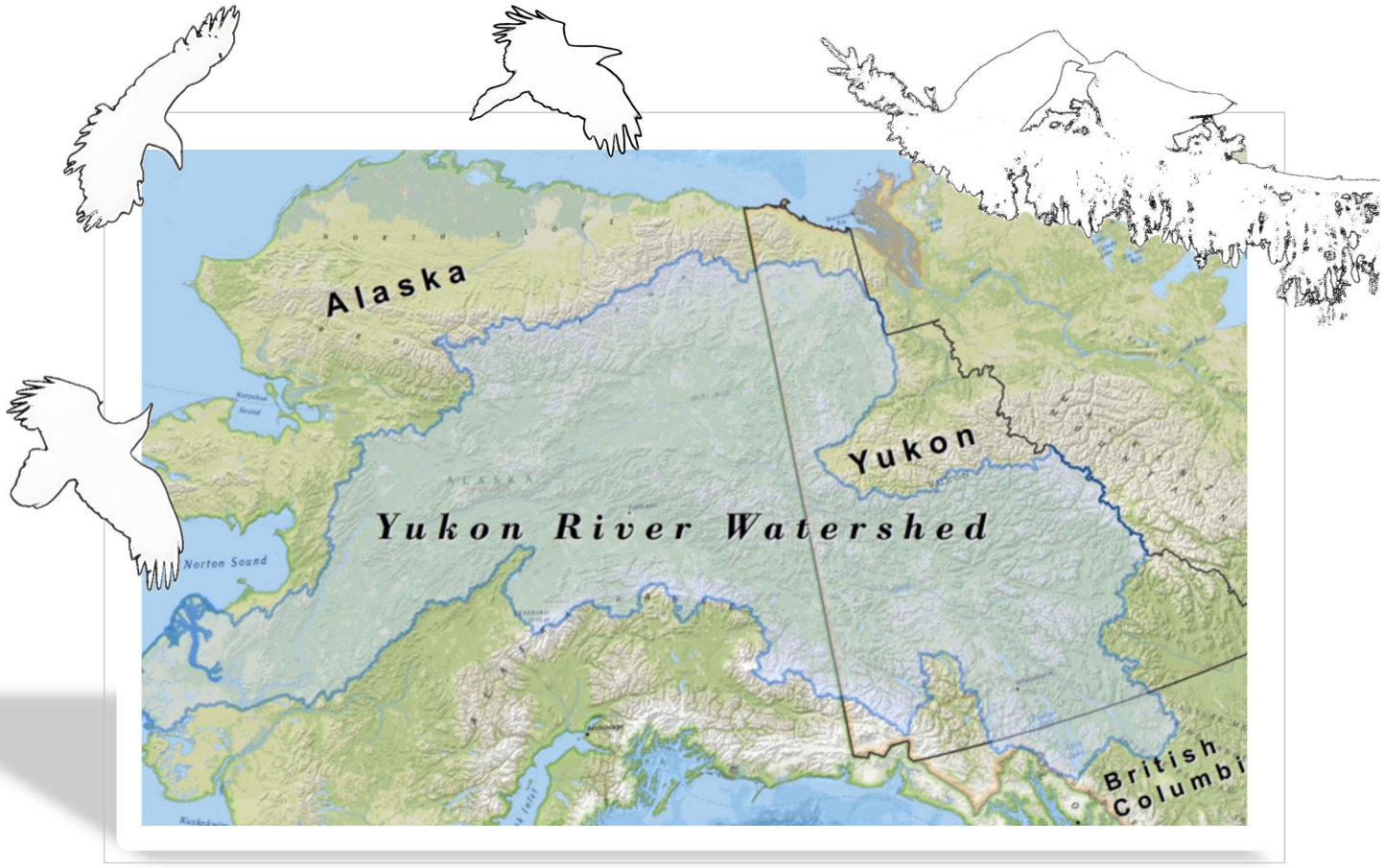
ONE PEOPLE-ONE RIVER

Yukon River Inter-Tribal Watershed Council



coloring & activity book about
Water and Watersheds
centered on
the Yukon River Watershed

This is one of two activity books about water and watersheds centered on the Yukon River—with familiar images for coloring and first language word puzzles. This first book introduces water and watershed science, and the second book introduces ecology, weather, and climate.

Activities in both books include "Ask an Elder" questions to encourage conversations about the natural world. There are also crossword puzzles, word finds, column matches, and fill-in-the-blanks. We hope these books make learning about water and watersheds fun for kids of all ages!!

Daazhraii –Gwich'in

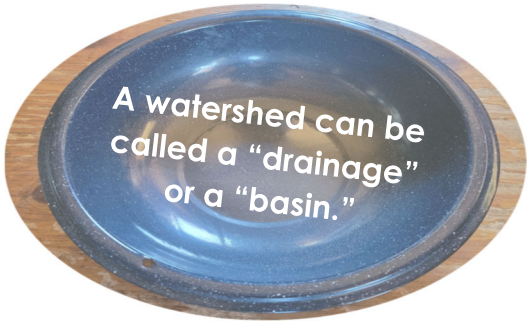
(Cygnus buccinator)

Why does water matter?
BECAUSE
WATER IS LIFE

Your blood is mostly water and your brain is mostly water.
You can only live without drinking water for a few days.

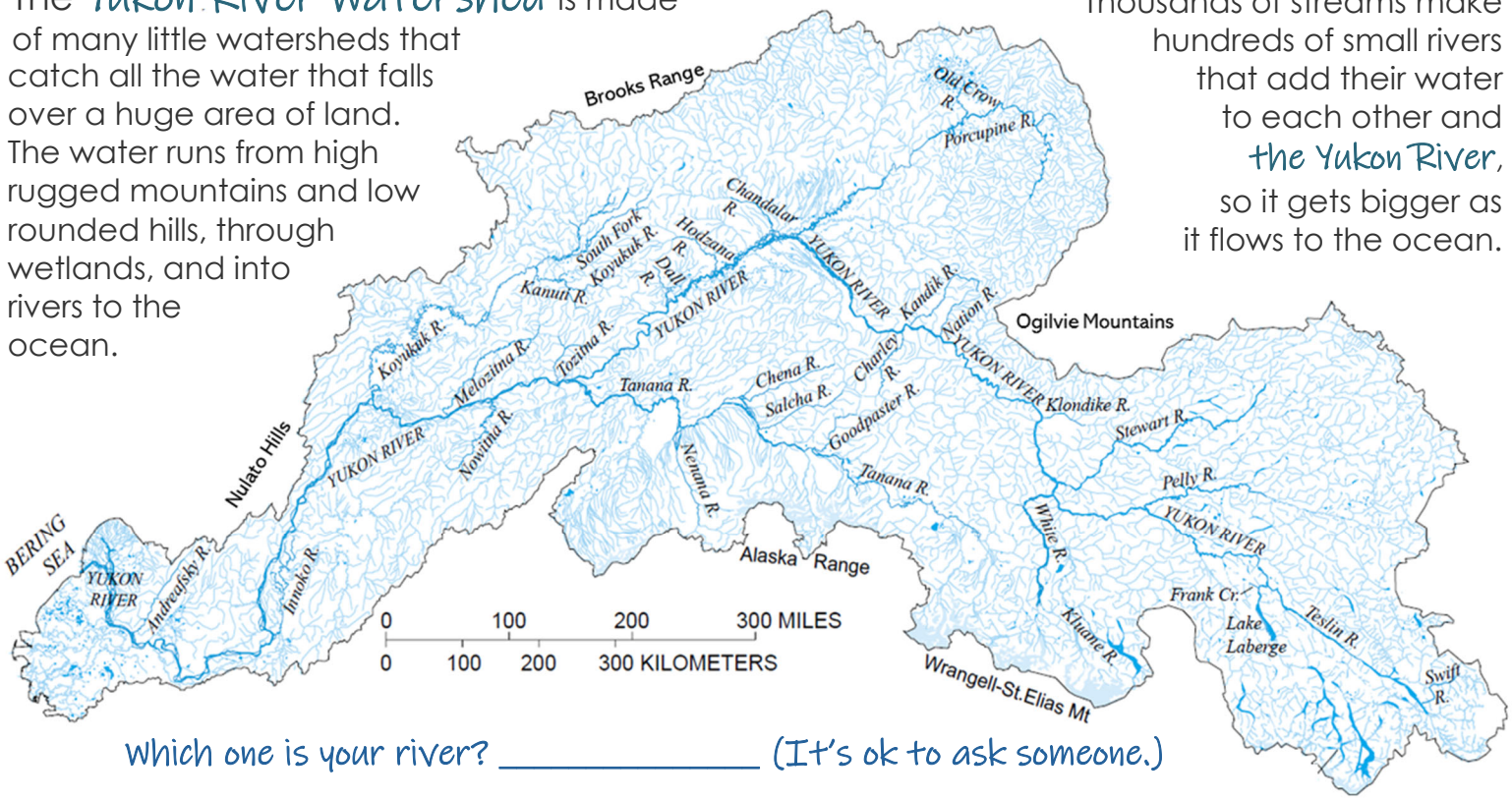
WHAT IS A WATERSHED?

A watershed is an area of land that all drains to the same place.



The Yukon River Watershed is made of many little watersheds that catch all the water that falls over a huge area of land. The water runs from high rugged mountains and low rounded hills, through wetlands, and into rivers to the ocean.

Thousands of streams make hundreds of small rivers that add their water to each other and the Yukon River, so it gets bigger as it flows to the ocean.



Which one is your river? _____ (It's ok to ask someone.)

Every creek has its own little watershed

(the area of land that catches the creek's water)
Little watersheds add up to bigger watersheds

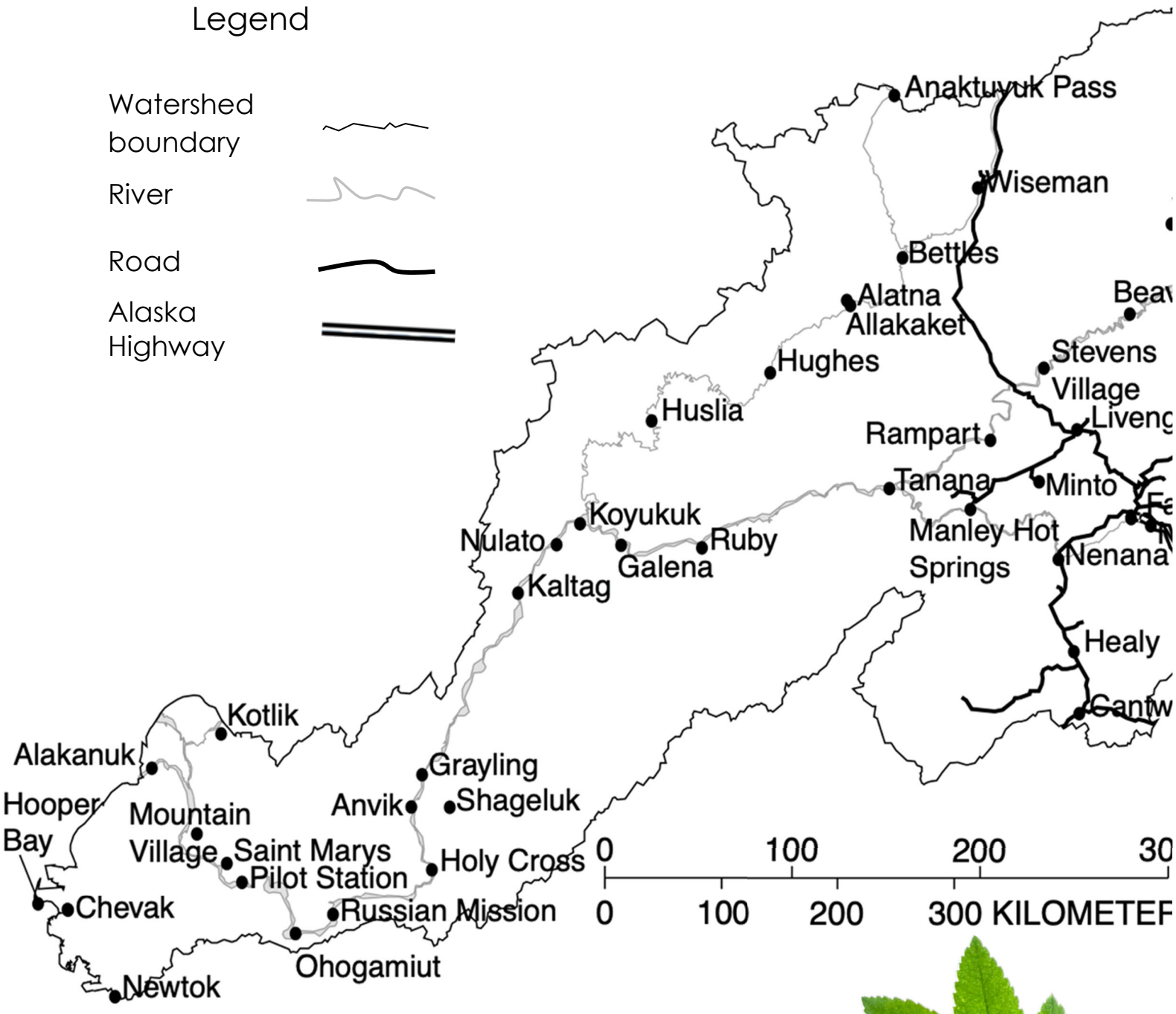
These mountains are between the Tanana River and the Yukon River. Like all mountains, they are covered with watersheds. A watershed catches all the water that falls on it and 'sheds' it to the same place.

A recent _____ burned over the mountain but not in the valleys with thick green _____.

The area circled in _____ is a watershed, and so is the area circled in _____. Together, they make the watershed circled in_____.

(Gray Plants Black White Fire)

Where in the Watershed are YOU?



Where else have you been? _____

Was that upriver or downriver? _____

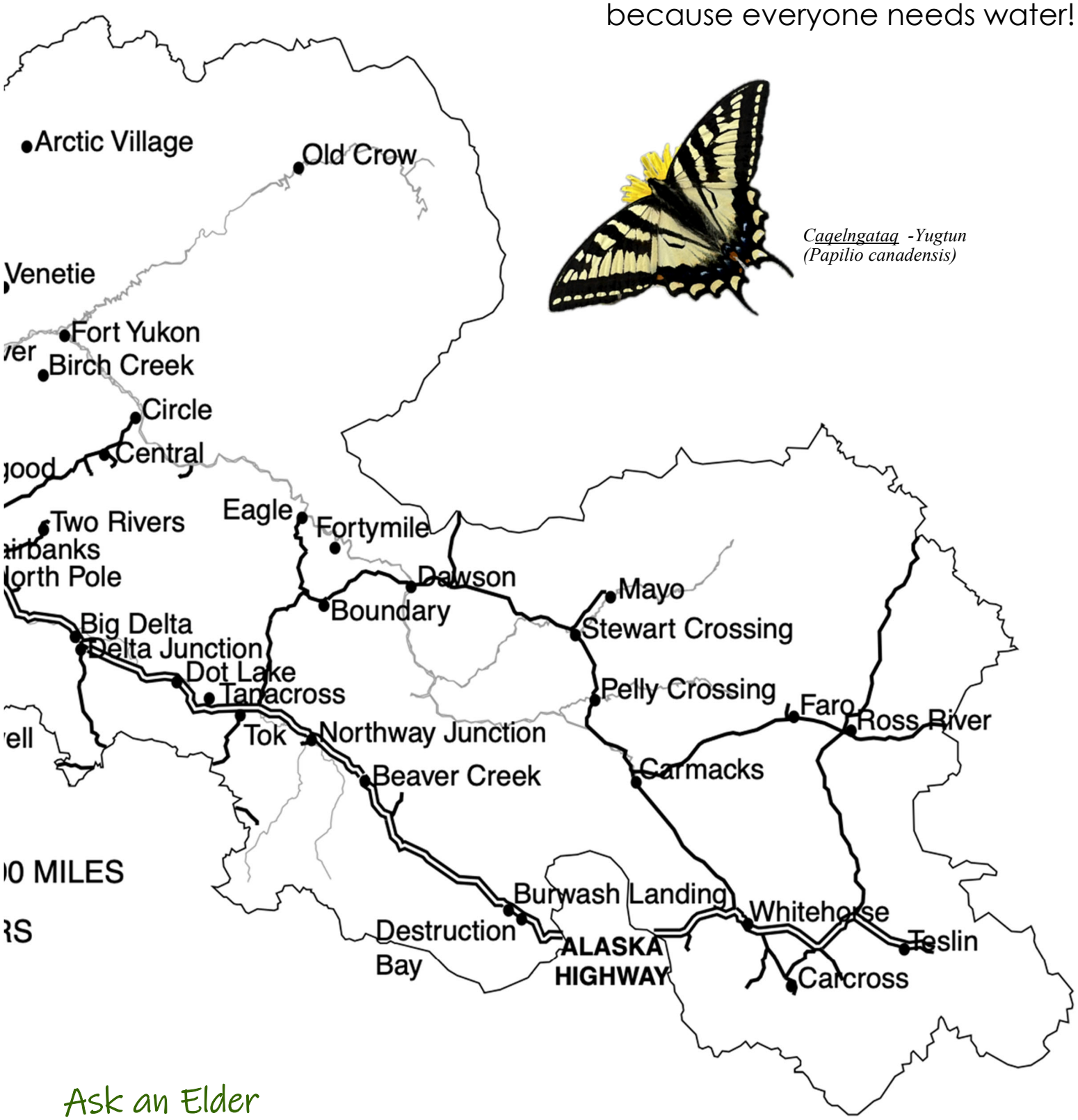
How far away was it? _____

Xos t'qą' -Tanacross
(Rosa acicularis)

Down by the Riverside

Communities are found along rivers
because everyone needs water!

Cagelngataq -Yugtun
(Papilio canadensis)



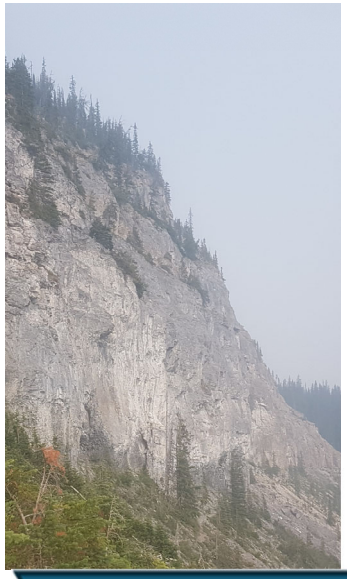
Ask an Elder

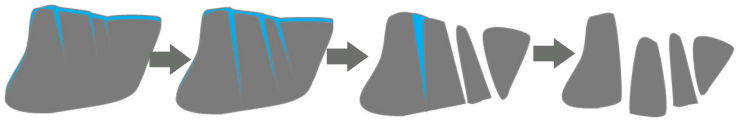
Where in the watershed have you been??

What's the longest river trip you ever went on?

How does WATER turn MOUNTAINS into BEACHES?

by breaking rocks and moving them down hill





Water breaks rocks by getting into cracks and **expanding as it freezes** over and over and over again in a "freeze-thaw cycle."

Rocks keep breaking as they fall off cliffs, roll down hills, and bang into each other.

Water pushes and carries rocks of all sizes—in rivers and in landslides!

boulders, cobbles, gravel, sand, and silt

Glaciers grind rocks against each other, crushing them into powder ("silt").

The Yukon River carries tons of silt *thousands of miles*, and that's what makes the water grey.

Beaches Driftwood Rocks All Shaped By Water

How does water break rocks?

a) water gets into cracks and expands when it freezes
b) again and again and again
c) water knocks rocks against each other
d) all of the above

How does water move rocks?

a) boulders get pushed very slowly
b) gravel gets lifted and pushed
c) sand tumbles along the bottom
d) silt can get carried for miles
e) water makes land slide
f) all of the above

How long does it take to turn a mountain into a beach without dynamite and bulldozers?

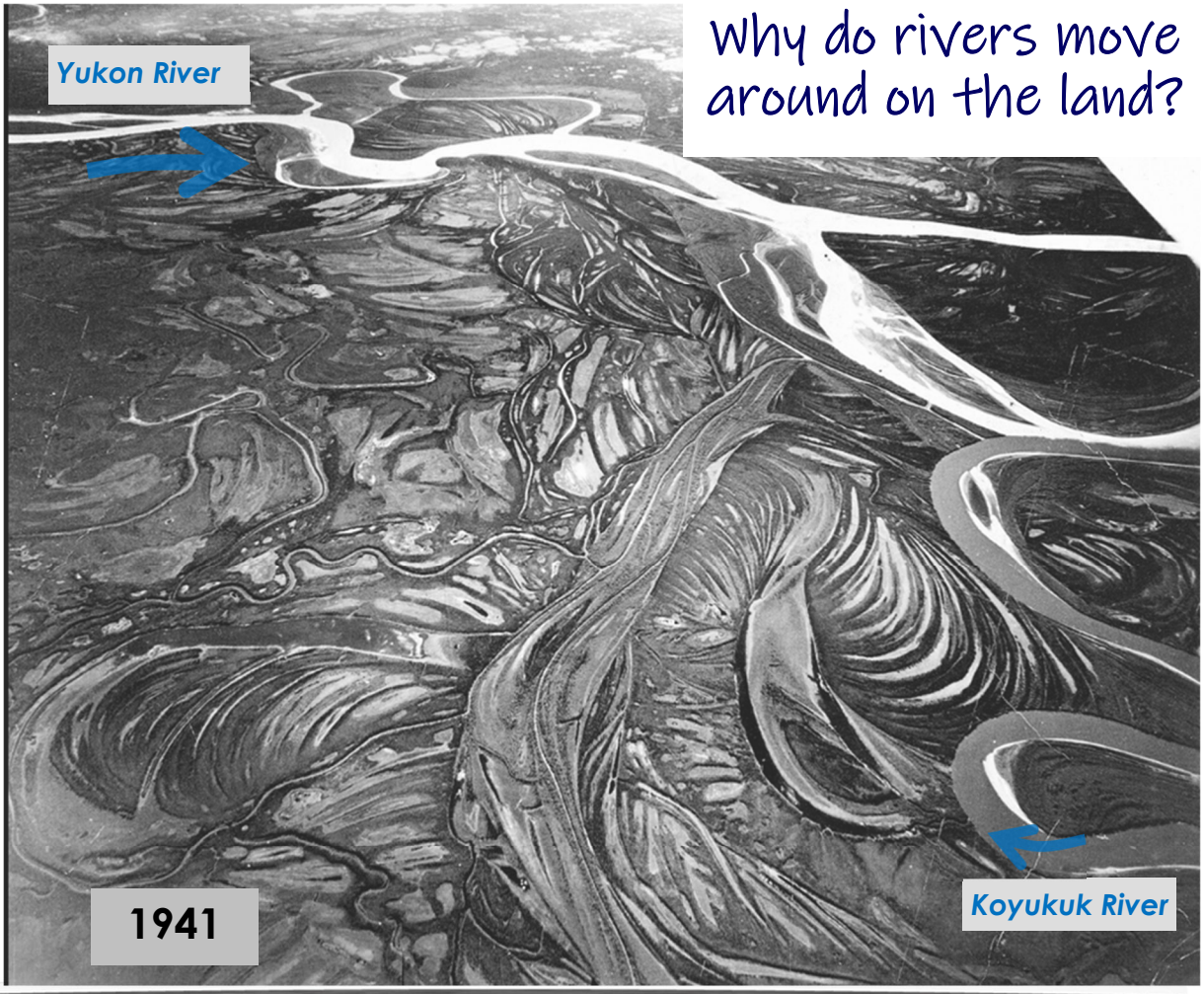
a) Dozens of years
b) Hundreds of years
c) Thousands of years
d) Millions of years

(a f d)

Why do rivers move around on the land?

These two "aerial images" (pictures taken from the air) show how rivers change the landscape over time.

The view is looking south over the Yukon River with the Koyukuk River entering on the lower right.



Can you find three streams that got bigger and three streams that got smaller or disappeared between 1941 and 2024?

Do you see any that moved or changed shape?

Rivers move around on the land because they constantly pick up and put down **sediment** (rocks that are moved by water and wind). We call it ***erosion*** when the river takes land by moving sediment down river, and ***deposition*** when the river builds land by depositing sediment. Rivers have always moved around on the land, but they are moving faster now.

You can see sand bars on the slow side of the river in places where the river is building new land in this picture of the Yukon River. The pointy sand bars are called "point bars." Erosion is not as easy to see from the air, but if you look closely, you can the steep cut bank on the fast side of the river—like in the picture above.

As river's flow, they travel _____ on the outside curve, which cuts away at the riverbank.

Rocks that are moved by wind or water are called _____.

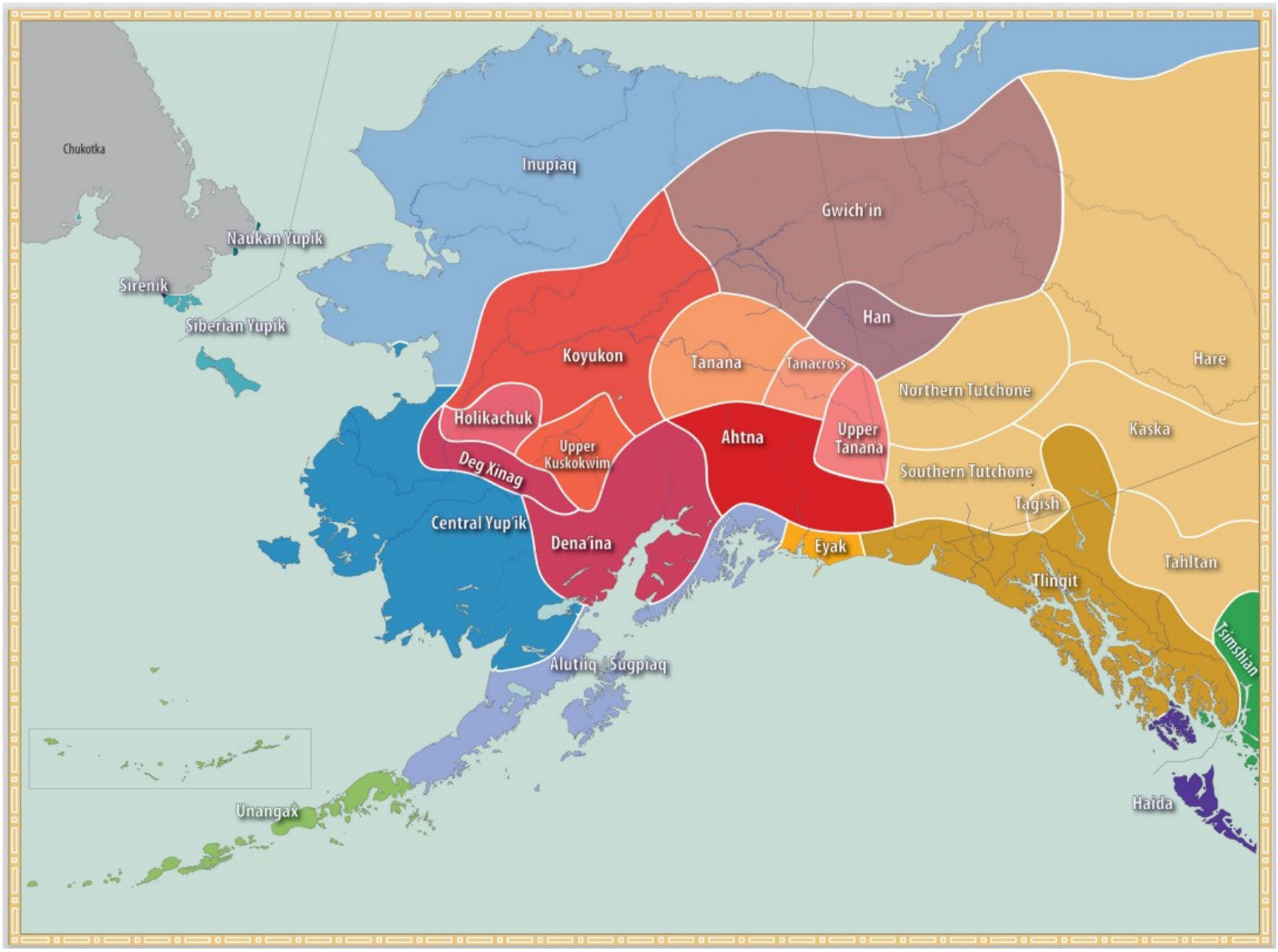
The process of _____ builds land by depositing sediment.

The process of _____ moves sediment down river.

What do you think will happen in the place that is circled in white?

_____

(sediment deposition erosion faster)



The Yukon River Watershed is home to 16 different Indigenous languages spoken here for thousands of years: Lingít, Tahltan, Tagish, Kaska, Southern Tutchone, Northern Tutchone, Hän, Gwich'in, Upper Tanana, Tanacross, Lower Tanana, Denaakk'e (Koyukon), Holikachuk, Deg Xinag, Iñupiaq, and Yugtun. These languages are closely related to their lands, and the boundaries between them were natural, often between watersheds.

Fourteen of the sixteen languages are part of the Na-Dene language family, and two are of the Inuit-Yupik language family. Few people speak these languages anymore; some of the languages have no speakers.

Some names for the Yukon River sound like each other:

Yookkene –Denaakk'e (Koyukon)

Yeqin –Deg Xinag

Some sound very different, such as Kuigpak – the Yugtun word for the Yukon River.

A river might have its own name (Tanana, Koyukuk, Nenana, etc.), but all languages have a general name for "river"… **kuik** –Yugtun; **kuuk** -Iñupiaq; **han** –Gwich'in; **xin** –Deg Xinag; **tth'ichuu** -Hän; **tth'iitú'** -Tanacross. Some of the words for river sound like each other.

WATER

MEQ

TUU

TU

CHUU

TOO

TUU

TOO

TE

IMIĠIKSAAQ

CHŲŲ

Yukon River Watershed Indigenous Languages

Elements of the Water Cycle

Language	ice	snow	rain	sun	wind
Yugtun (Yup'ik)	ciku	apun	cellalluk	cinguruuq	anuqlleq
Iñupiaq	siku	apun	siḷaluk	siqiñiq	anuġi
U. Tanana	tanh	shyuh		saa	ehts'aih
Tanacross	łuut	shétth	chąą	saa	ehts'eyh
L. Tanana	tenh	tsitl	ełchonh	sro	ełtr'eyh
Hän	łut	zhäh	chąh	sraa	hohtr'ey
Gwich'in	tan	zhah	ahtsin	shree	ahtr'aii
Denaakk'e	tenh	tsetl	konh	so	ełts'eeyh
Deg Xinag	tinh	yith	chonh	no'oy	xidetr'iyh
Holikachuk	tinh	tsetl	konh	na'oy	xidets'iyh

WORD FIND

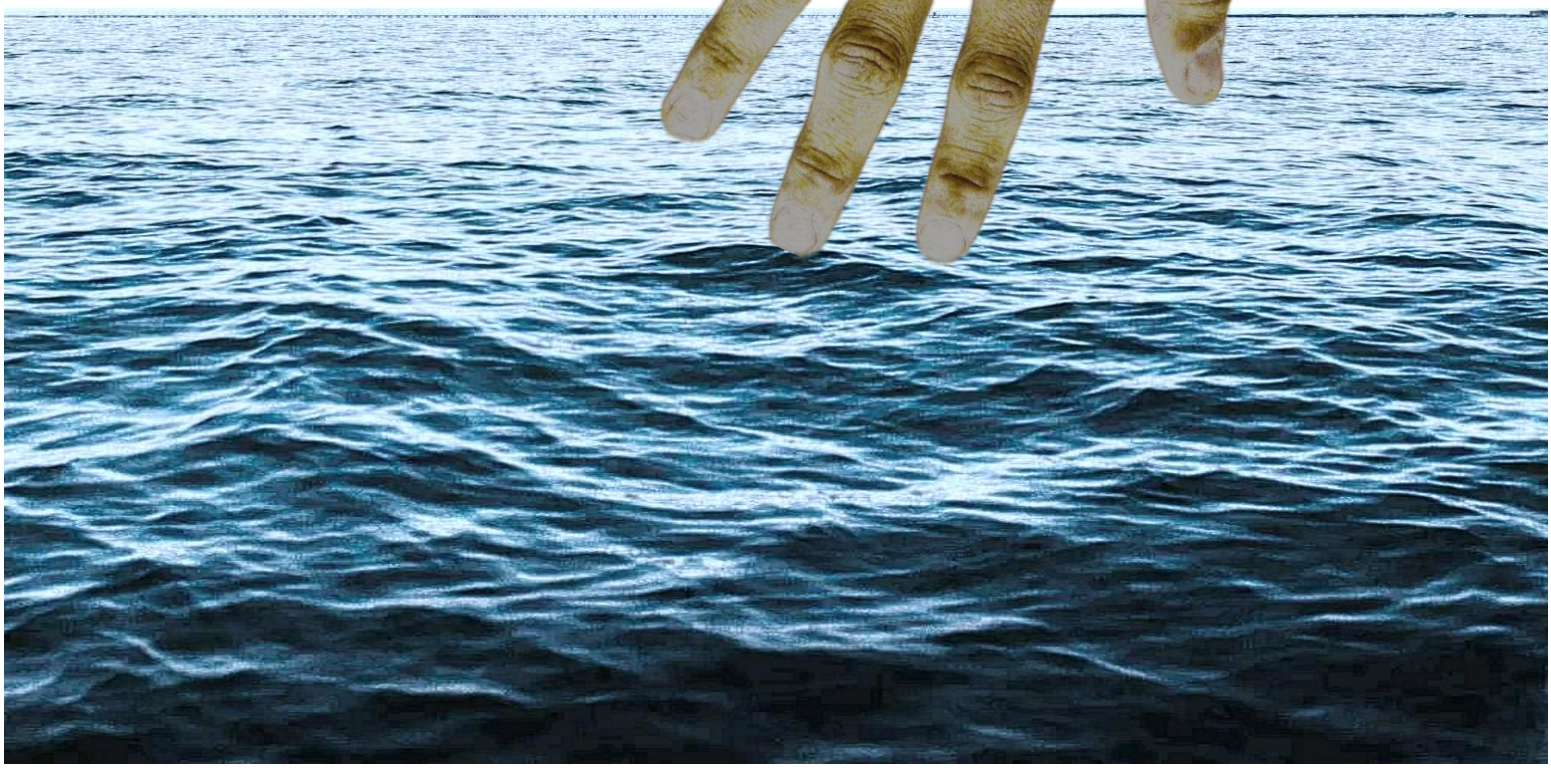
F Z J H L Q Q O F H G C L H D
C E L L A L L U K A N H O U A
C S S S H A H Z A H S A A Y G
H I C C H O T S N I A A T H N
O K N V M E V I L U P S Y S C
N U N G N N T A W K Ł U U T J
H S B H G S L T X I L T E S T
D N I J H U N S H C Z S H N B
L M O R K U R A H T S I N G E
E K E K P W P U P Y H S O Z D
G E O A V B B J U Y O A S U G
A K Q I Ñ I Q I S Q V A R L D
U R O K R Z T R D H V R A N O
Q Y I N Y I T H R B A S A W W
L C N R H N D Y Y I N T Z Y X

cellalluk	ahtsin	apun
chonh	chaa	chah
konh	ciku	cingguruuq
saa	konh	łuut
shyuh	shetth	shree
siqiñiq	siku	silaluk
tan	so	sraa
tinh	tanh	tenh
zhah	tsetl	yith

Ask an Elder: Which language is ours? How do we say these words?!

Tr’ookìt Nan Iltsąįį.

Deenaadàį’ nan kwaa ree gwinyaa. Dinjii ch’ihłęę zhrįį khwąh kat doodìi ts’ą’ neeteeyahahchik. Nihky’ąą nan kwaa chųų zhrįį diineedha’ee. Yeedòk hee zhrii ìyìich’y’ą’. Dzan ree dinjii hàa nihidik vàrahnyaa. Nįįghyùk hee neeteegoohahchik ts’ą’ gòhch’it gwàndàa khwąh kat geetr’agâah’at. Dinjii t’inyaa vàrahnyaa, “Nan tsal diinleegąįį t’ee gąhtsii hàa jì’ googàa nan kak vakak k’eerii’òo hałtsyàa.” Dzan dinjii eeghaii t’inyaa vàrahnyaa, “Chee gwich’in ihłįį googàa tth’aii nan nał’in kwaa. Łi’hàa zhakdhat noiizhii jì’ dèegiheech’yàa lì’?” “Gwik’èegwiindàii,” vàrahnyaa. Dzan ditsì’ ts’ik chyąąhkhaa ts’ą’ zhak hee k’igideenjìk. Shriit’agwąhkhyùk gwahàadhat tł’ęę kheekyàakaii. “Oozhòk khìk neehihdik gehzhàk tr’iizhii gǫǫ shizhit najat aanąįį ts’ą’ gwazhąą tr’eegwąąłtr’àt.” Nįįghyùk gwahàadhat kwaa tł’ęę, “Chan gwik’èeneegwihihndàii,” nyaa ts’ą’ chan hee chìneezhii. Ch’adąį’ dèegwąhkhyùk gwihìłthat jùk gwàndàa t’agwąhkhyùk neegwihìldhat. Ts’ą’chan hee khàneetsyàakaii. “Nan nał’yą’ gwich’in gǫǫ khaiinjii shihdèe shuu’aanąįį ts’ą’ gwazhąą khan tr’eeshizhii.” Nalzhàk tł’ęę, “Chan oozhàk nineehihdyàa,” nyaa. Gwintł’òo neehòozhii tł’ęę chan chineetòl’ahnąįį. Jùk at’ôhju’ it’ee nįįghyùk gwihiłthat. “Kheeheedyaa kwaa łii,” tr’oonyaa gwiizhik nehshrit chųų kak neegòonjik. Vizhìi kwaa ts’ą’ vat’àii chan kwaa ts’ą’ khwąh kat oo’àn hìltthat. Nįįghyùk gwahàadhat kwaa ts’ą’ k’iidàk neenòhòdii tł’ęę “Nà’!” nyaa ts’ą’ nan tsal hàa dinjii antł’ǎanjìk. Shan hàa jii nan ts’an jùk nan vakat tr’igwi -ch’įį tr’iłtsąįį gwinyaa.



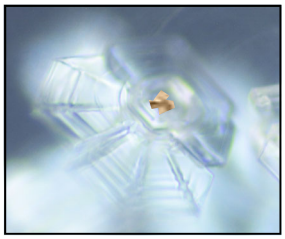
The Making of the World. Long ago, it is said, there was no land. Just one man was sitting on a raft and it was floating around with him. In every direction there was no land, only water. Above him only the sky was to be seen. Now there was a muskrat going around with the man, they say. The water carried them around for a long time, and finally they got tired of being on the raft. So the man said, “If you'll get a little bit of dirt in your claws, I'll make land for us to walk around on.” The muskrat answered the man, “I live in the water, but still I have seen no dirt. I wonder what it would be like if I were to go really far down?” “Try it,” said the man. The muskrat flipped his skinny tail into the water and vanished below. After he had been gone for quite a while, he came up head first. “I went down there farther than I usually go, but I became afraid and I hurried back up.” After a little while, saying “I'll try again,” he went back into the water. He spent a longer time than before. After that, he poked his nose out again. “I think I saw dirt, but I was almost out of breath, so I hurried back up.” After resting again, he said, “I’ll go down again.” He took a great breath and dived back into the water with a splash. This time he was really gone for a long time. While the man was thinking, “It seems he won't ever come back out,” the muskrat barely struggled to the surface. He was out of breath and exhausted, but after he was back sitting on the raft, saying “Here!” he handed the man a little bit of dirt. By magic he made from this earth the land on which we live today, it is said.

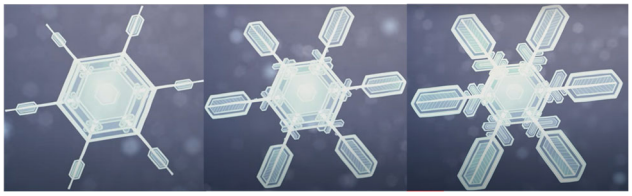
Told by John Fredson to Edward Sapir

How is the land that muskrat helped build like SNOWFLAKES and RAINDROPS?

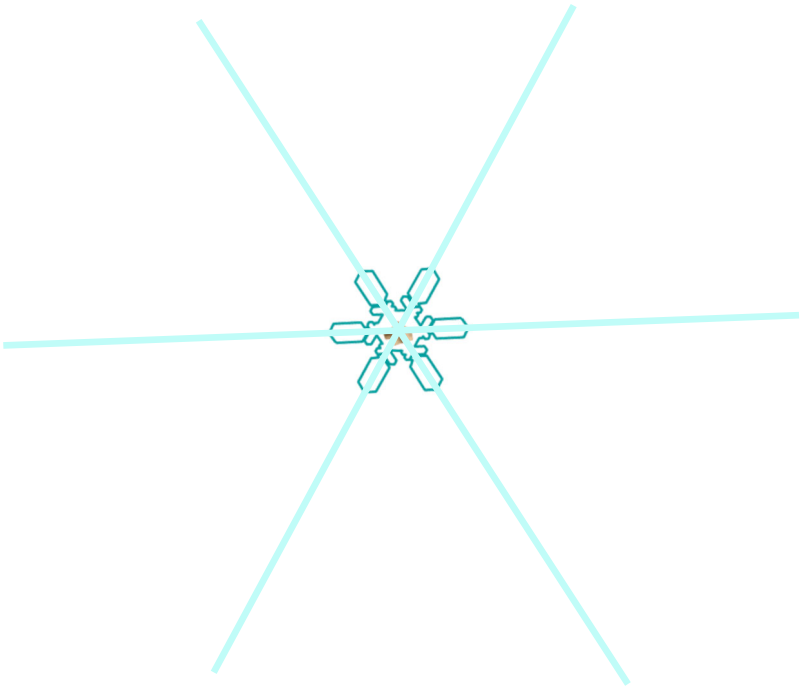
A tiny bit of dirt, and magic!!

Snowflakes and raindrops begin when a tiny bit of water gets stuck on a piece of dust or pollen.

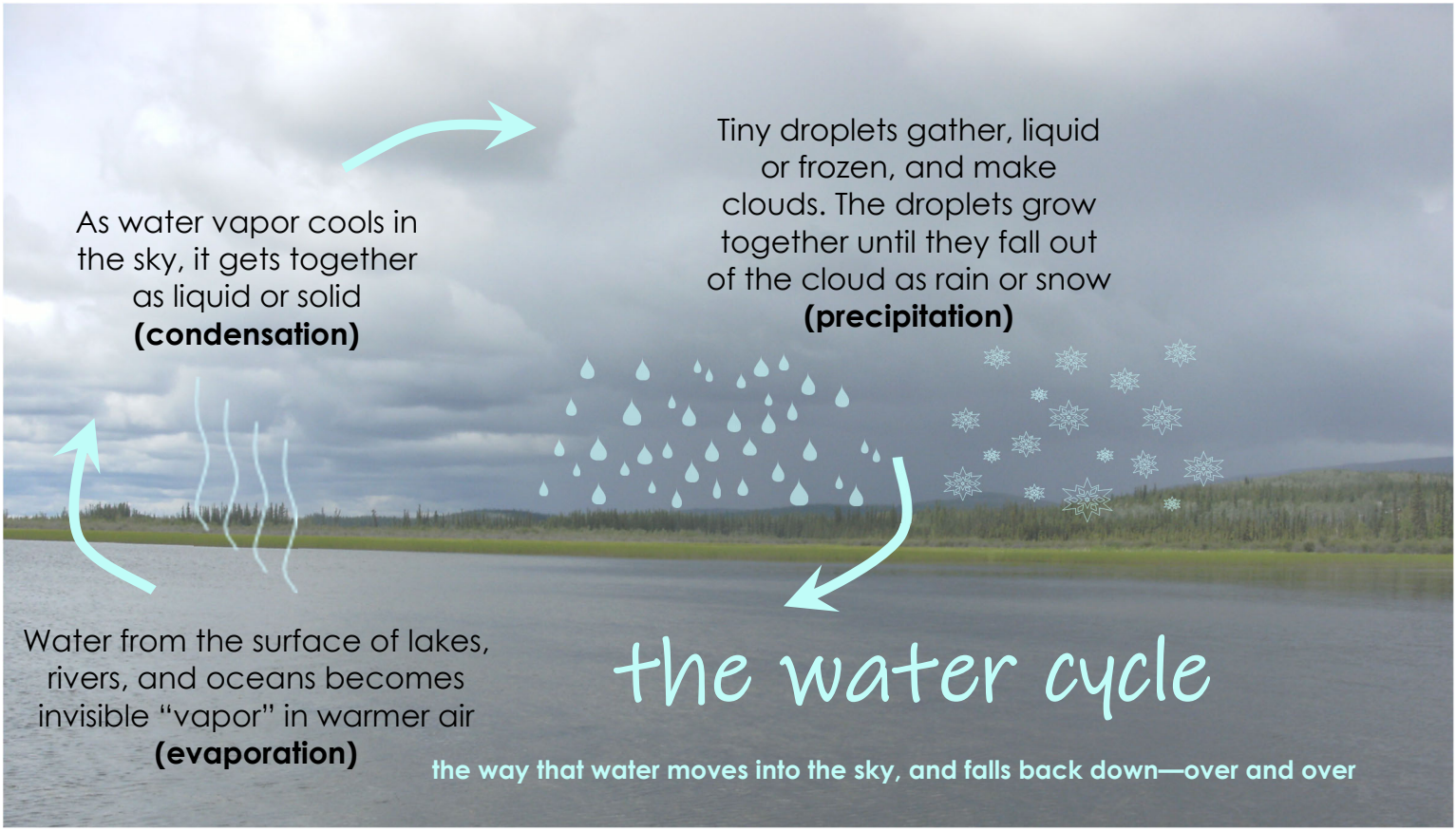




By water's magic, snowflakes grows the same way on all six sides - a little differently every time!



"Grow" this snowflake—the same in six directions.



Three States of Water

Water can be frozen SOLID into ice, which floats on liquid water.

Water is usually LIQUID, which makes rivers and everything we drink.

Some water floats in the air a GAS (VAPOR), which makes clouds when it condenses.

Imagine being a drop of water that falls on a glacier as a snowflake. You fall with millions of others and get buried. You go deeper and deeper, crushed into ice by tons of snowflakes falling on top of you. For years, you travel slowly down the valley, frozen _____. The glacier rumbles and you feel a ***crack*** boom nearby as it creeps over a steep cliff and everything gets very bright. For weeks you notice neighbor-drops running down the crack and then you _____ and there you go—sliding down the ice to a river underneath the glacier. A wild ride begins! After a few days of crashing through jumbled and tumbling rocks with gravel, sand, and silt, everything slows down and you can't carry the mud anymore. As you flow slowly by the edge of a large lake, you get warmed by the sun and fly into the sky in pieces (_____).

Scattered in the sky as a _____, you cool off as you rise. You get yourself together on a tiny piece of dust (_____) and gather into a _____ with other droplets. As you tumble in the cloud, you grow until you are so heavy that you _____ down through the sky as a _____ raindrop. **SPLAT!** You hit the ground and soak in deep with millions of other drops. You work your way through sand and gravel, and it takes years to get back to the river—but you do. Before you get to the ocean, the river floods and you find yourself on land. When the sun comes out, you warm up and scatter to the sky as you _____. This time you get caught in a storm system and the wind blows you over the mountains—suddenly it's freezing cold! You get yourself together on a tiny bit of pollen (_____) and stretch out as you freeze into a snowflake. As you tumble in the cloud, you grow until you are heavy enough to fall out (_____). And so it goes, over and over and over again, a little different every time.

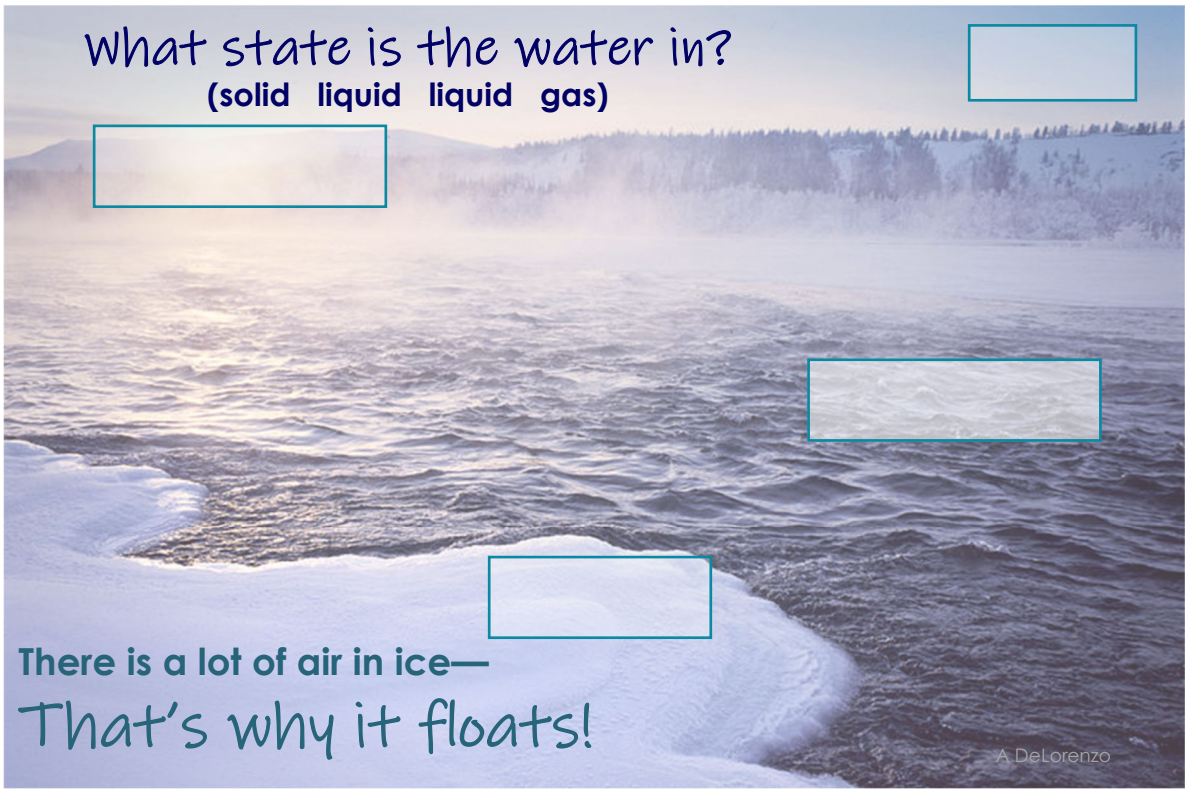
Maybe next time a moose will drink you, or you will get pulled up into a tree!!

precipitate
precipitate
evaporate
evaporate
condense
condense
cloud
liquid
solid
melt
gas

Fog and clouds are made of liquid or solid water, *not vapor*.

Water vapor is invisible gas that condenses quickly in cold air—

that's why we see our breath in winter.



Rivers in the Yukon River watershed have always been important travel corridors, liquid or solid!!

A WATERBODY is a collection of water on Earth's surface

Waterbodies flow and store water

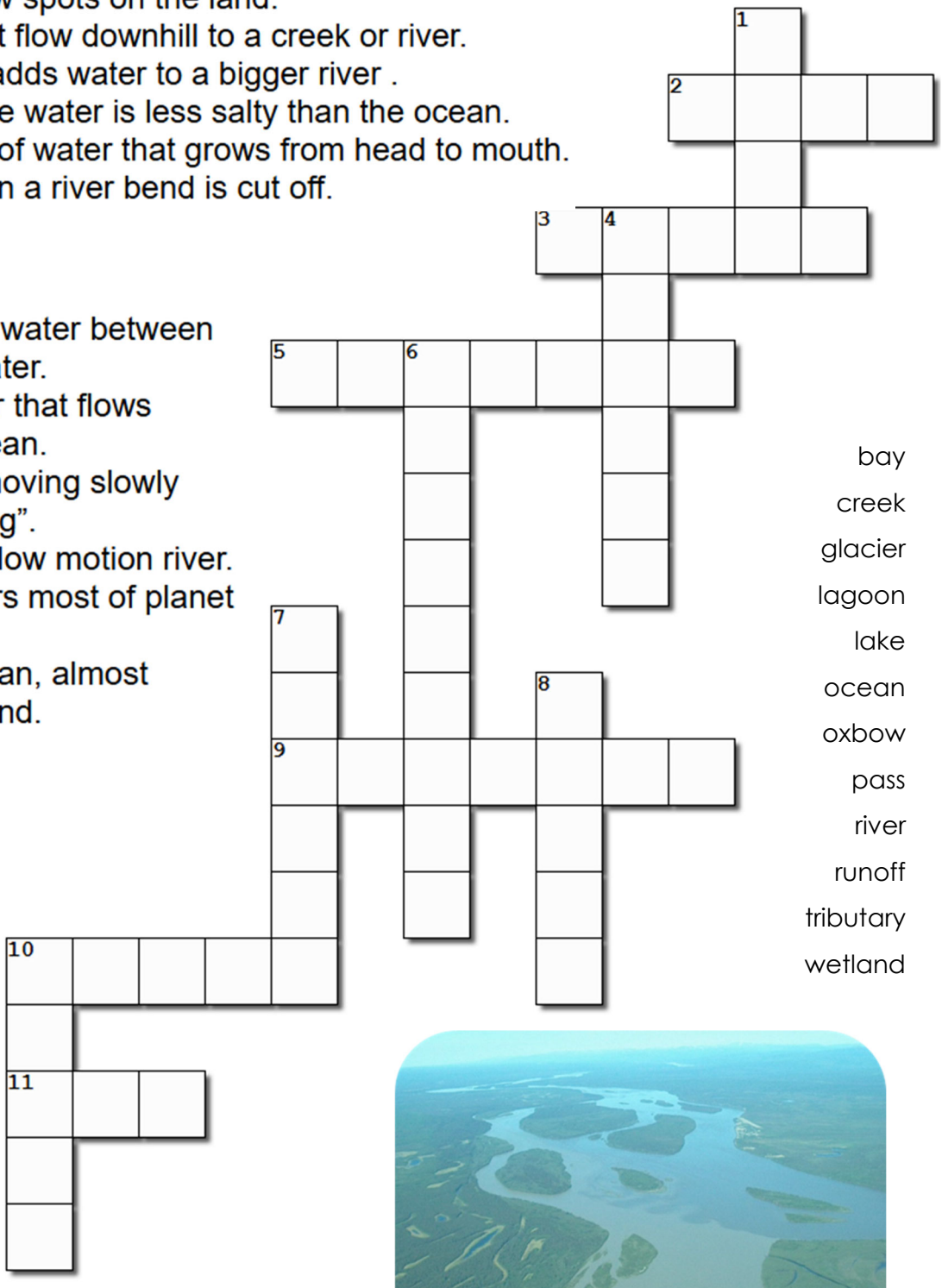
Waterbodies and Landforms give each other shape and make each other who they are!

Down

1. Water collected in low spots on the land.
4. Dribbles of water that flow downhill to a creek or river.
6. A creek or river that adds water to a bigger river .
7. A small bay where the water is less salty than the ocean.
8. A large flowing body of water that grows from head to mouth.
10. A lake left over when a river bend is cut off.

Across

2. A narrow passage of water between two bigger bodies of water.
3. A small body of water that flows toward a river or an ocean.
5. A flat area of water moving slowly through "swamp" or "bog".
9. Ice that flows like a slow motion river.
10. Saltwater that covers most of planet Earth.
11. Part of a sea or ocean, almost totally surrounded by land.

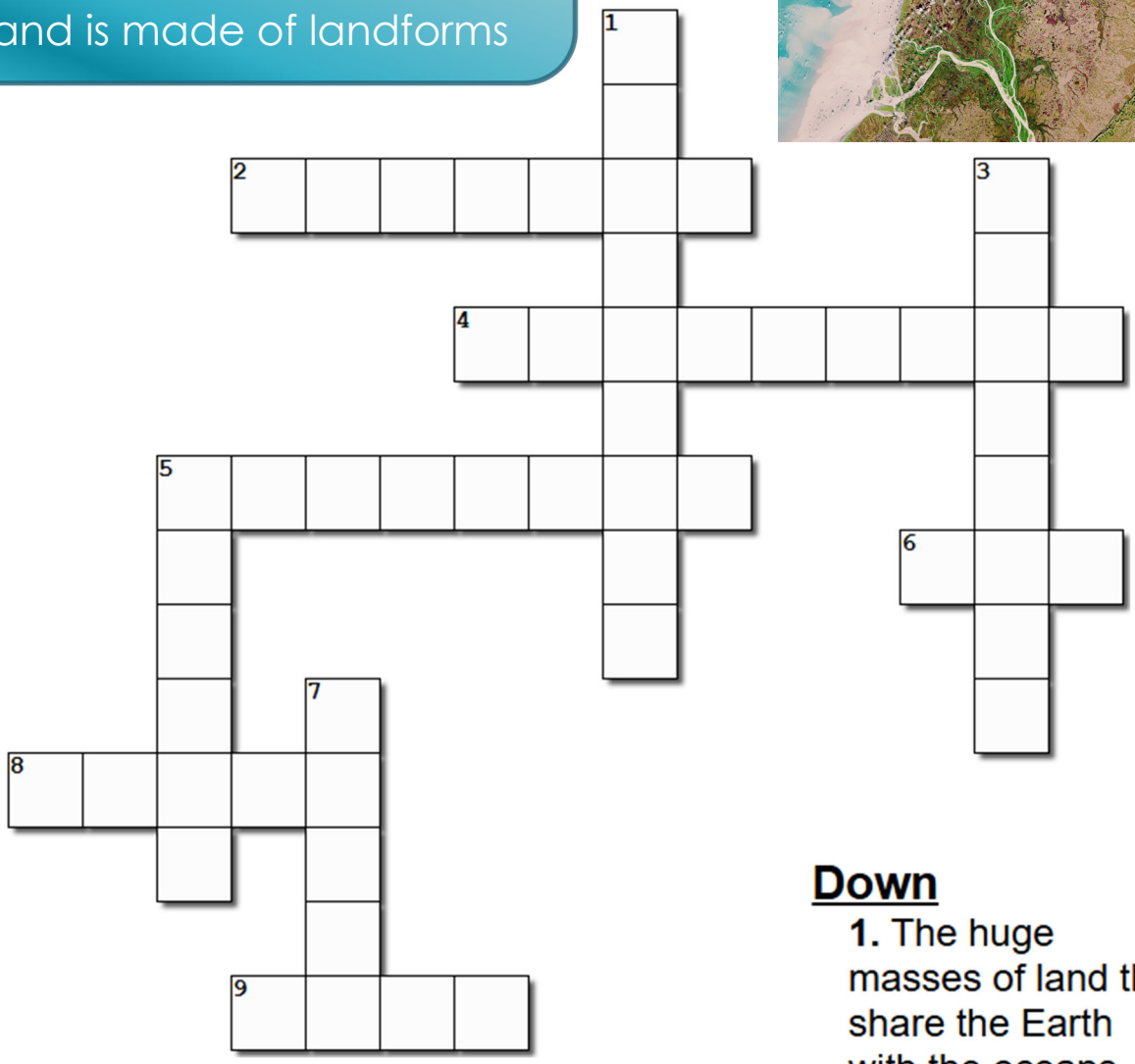


bay
creek
glacier
lagoon
lake
ocean
oxbow
pass
river
runoff
tributary
wetland

A LANDFORM is a feature of Earth's surface

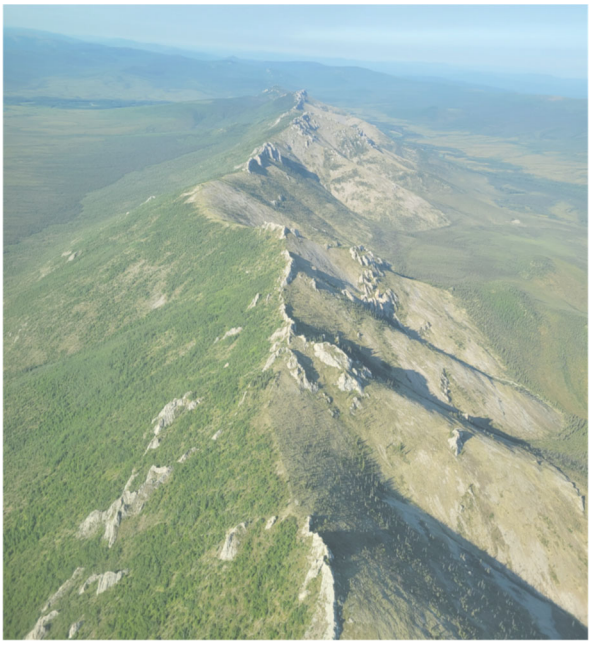
Mountains, beaches, islands—all land has shape and is made of landforms

continent
cutbank
dam
delta
headwall
pass
point bar
rapids
ridge
riverbed
valley



Across

2. The steep riverbank cut by a river on the fast side.
4. The pointy sand-bar a river leaves on the slow side
5. The groove at the bottom of a valley where water flows.
6. A structure that stops water from flowing downriver.
8. The high edges of a valley.
9. A low point on a ridge between watersheds.



Down

1. The huge masses of land that share the Earth with the oceans.
3. The highest part of a valley; the river's head.
5. Steep ground where water moves fast ('whitewater').
7. Fan shaped land built of sand and mud at the mouth of a river.

Yukon River Watershed Indigenous Languages

Landforms

Language	mountain	hill	valley	glacier
Yugtun (Yup'ik)	ingriq	penguq	quuruq	
Iñupiaq	iġġiq	qimiq	kuuġuq	auyuiḷaq
U. Tanana	dhał	taih	ch'itł'aa	
Tanacross	ddheł	teyh	ch'etl'aa	łuut ddheł
L. Tanana	ddheł			
Hän	ddha̋w	tay	nätl'at	göö
Gwich'in	ddhah	taih	antł'it	git
Denaakk'e	dleł	teyh	-tl'ot	łoo
Deg Xinag	deloy		srixtl'ot	
Holikachuk	sith	tiyh	yayiq	

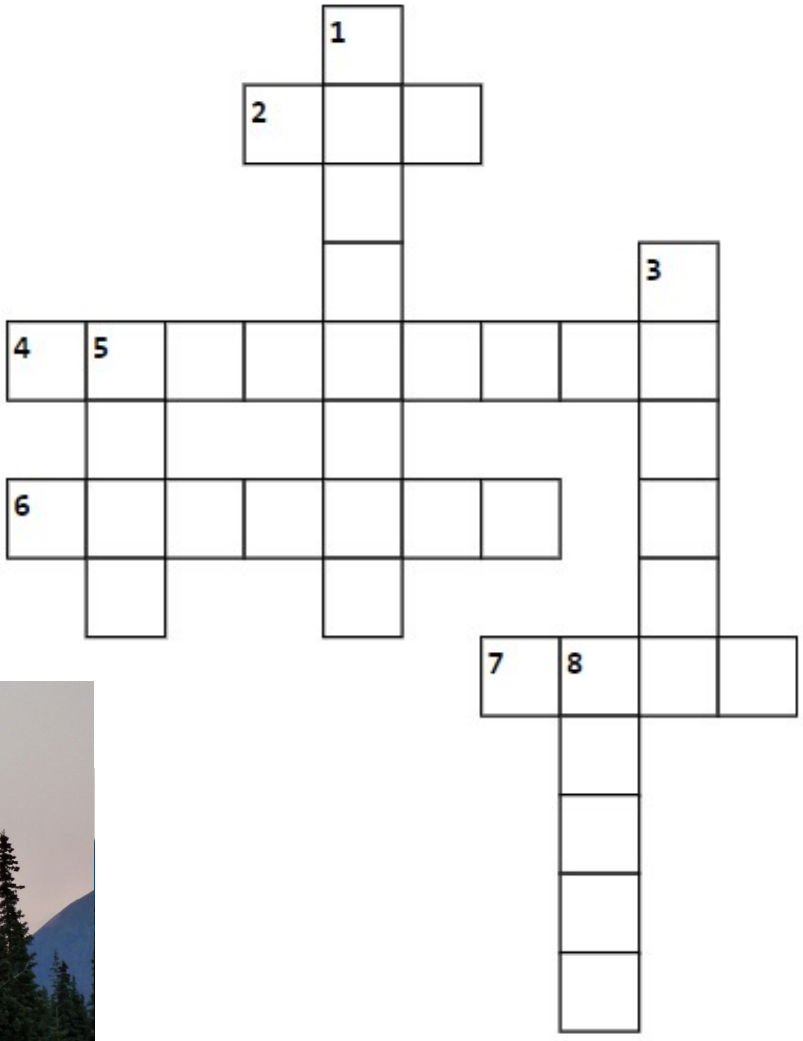
Glaciers fit here, but if you are wondering 'isn't a glacier made of water?' You're right! A glacier is actually a waterbody more than a landform.

Across

2. glacier (Denaakk'e ,#
4. valley (Upper Tanana)
6. łuut ddheł (Tanacross)
7. hill (Holikachuk)

Down

1. ddhäww (Hän)
3. srixtl'ot (Deg Xinag)
5. penguq (Yugtun)
8. mountain (Iñupiaq)



Yukon River Watershed Indigenous Languages

Waterbodies

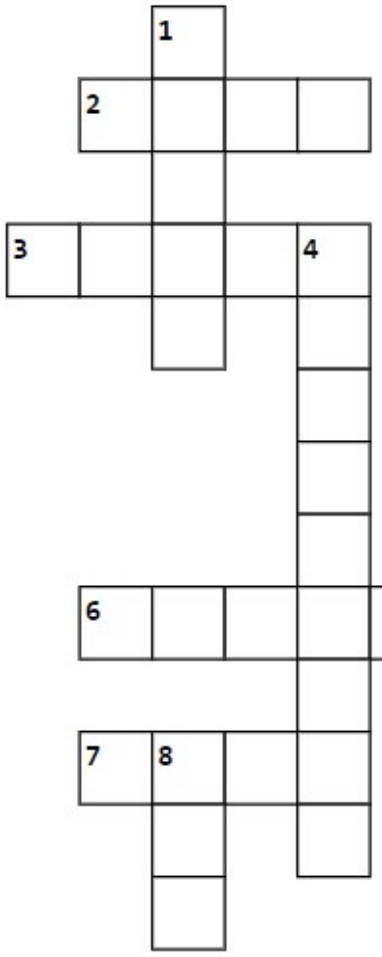
Language	water	river	creek	lake
Yugtun (Yup'ik)	meq	kuik	alirmaq	nanvaq
Iñupiaq	imiġiksaaq	kuuk	kuuġuqłuk	narvaġauraq
U. Tanana	tuu	Th'iitu'	xaniign	manh
Tanacross	tuu	Tth'iitú'	hên	menh
L. Tanana	tu	khwn'a		benh
Hän	chuu	tth'ichùu'	tächöö	männ
Gwich'in	chụų	han	k'ǫǫ	van
Denaakk'e	too	hen	-no'	benh
Deg Xinag	te	xin	srixno'	vinq'it
Holikachuk	too	xin	sixno'	minq'it

Across

2. vinq'it (Deg Xinag)
3. xaniign (Upper Tanana)
6. lake (Holikachuk)
7. water (Hän)

Down

1. imiġiksaaq (Iñupiaq)
4. creek(Iñupiaq)
5. kuik (Yugtun)
8. river (Gwich'in)



Ask an Elder: How do we say river in our language?

Because so much of Earth is covered with ocean, most precipitation falls into the ocean!

Imagine a drop of rain falling onto land and moving down toward the ocean. It might get into a river and flow very quickly.

OR, it might soak into the ground and take years to get to the river and then the ocean.

OR, it might get frozen in a glacier and take *hundreds* of years to get to the ocean!

Ask an Elder:

What else might happen to a drop of water?

WHERE IN THE WORLD?!

Color the oceans blue and
label the parts of the world that we call:

The Yukon River Watershed (YRW)

Arctic Ocean

Bering Sea

Alaska

Asia

Europe

Greenland

Pacific Ocean

North America

Atlantic Ocean

Central America

Yukon River Inter-Tribal
Watershed Council
201 E 3rd Ave
Anchorage, AK 99501
907-258-3337

This activity book is meant to foster environmental engagement among youth in the Yukon River Watershed, especially by encouraging conversations with Elders about the natural world. If you have questions or comments about this book, or to request copies, please contact us! **info@yritwc.org**

Images from YRITWC and:

Alaska Native Knowledge Network "clipart" collection: http://www.ankn.uaf.edu/publications/clipart/clipart.html

Alaska Department of Fish and Game Wildlife Ecology Cards.
https://www.adfg.alaska.gov/static/education/educators/curricula/pdfs/alaska_ecology_cards.pdf

National Oceanic and Atmospheric Administration https://www.noaa.gov/stories/how-do-snowflakes-form-science-behind-snow

The European Space Agency https://www.esa.int/ESA_Multimedia/Images/2018/01/Yukon_Delta

The Alaska Native Language Center Map https://www.uaf.edu/anla/collections/map/IPLA_simple.pdf

Dangerous Ice [Tanana River ice research (2005-07 & 2010-2013)] jukebox.uaf.edu/dangerice

Env & Hydro Overview of the YR Basin maps https://pubs.usgs.gov/wri/wri994204/pdf/wri994204.pdf

Yukon Flats Changing Environment https://www.fws.gov/media/yukon-flats-changing-environment-2021pdf

First Language from :

Making of the World (1982) John Fredson, Edward Sapir Hàa Googwandak (Stories Told by John Fredson to Edward Sapir)

Deg Xinag Learners' Dictionary http://ankn.uaf.edu/ANL/file.php/7/DegXinag.html

Tanacross Learners' Dictionary http://ankn.uaf.edu/ANL/file.php/3/dictionary.html

Doyon Languages Online https://doyonfoundation.com/language/dlo

Yugtun Online Dictionary https://www.yugtun.com

Iñupiaq Online Dictionary https://inupiaqonline.com

Hän Dictionary (1978) Ritter, John

Upper Tanana Dictionary (1979) Milanowski, Paul G.

Behnti Kenaga' Dictionary (In Prep) Kari, James & Tuttle, Siri

Koyukon Athabaskan Dictionary (2000), Jetté, Jules ; Jones, Eliza

Gwich'in to English Dictionary (2011), Alexander, V., & Alexander, C. .

Holikachuk Dictionary (1978), Kari, James with Jimmy Alexander, John Deacon, and Olga Deacon

Other resources

http://ankn.uaf.edu/Curriculum/Units/

https://usgs.gov/special-topics/water-science-school

https://www.nps.gov/subjects/tek/learning.htm

https://uaf-iarc.org/education

http://aswc.seagrant.uaf.edu/

https://climatekids.nasa.gov