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Science Snapshot Coloring Book

**Each of these sheets was created by Maria Burns, an OSU
alumna, in collaboration with the researchers featured.
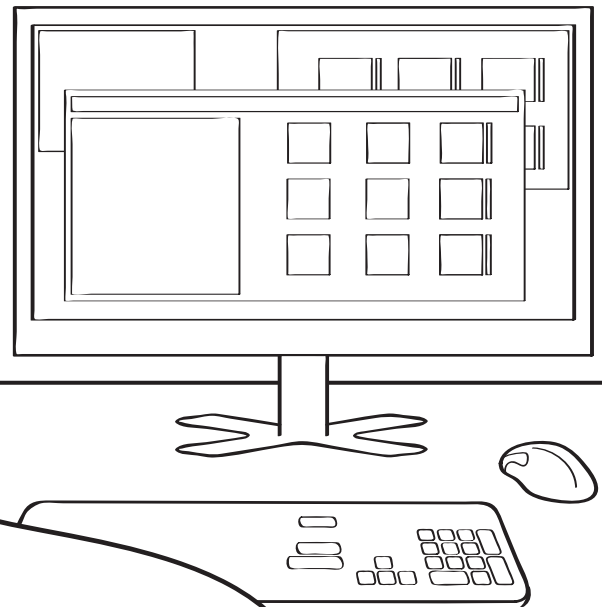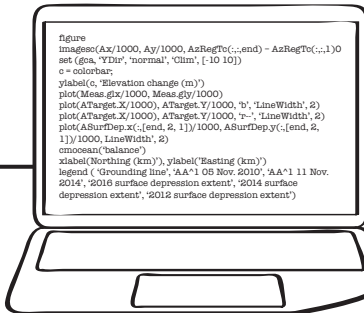Download sheets at go.osu.edu/ColoringBook/**

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Allison studies Antarctic ice shelves, the floating ice at the edges of the Antarctic ice sheet. She uses remote sensing data collected from airplanes and satellites and analyzes the data with her computer at the Byrd Center.

Airborne and satellite technologies measure the height, thickness, and speed of the ice. Remote-sensing glaciologists like Allison create computer programs to study how the ice changes through time.
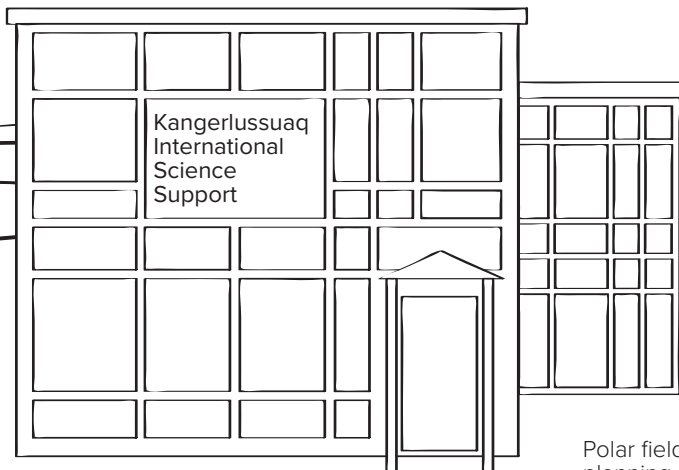
When ice shelves break apart or melt, more ice flows into the ocean which raises sea level. Allison's research is important for understanding ice shelf stability.

```
figure
imagesc(Ax/1000, Ay/1000, AzRegTo(:,:,end) – AzRegTo(:,:,1)0
set (gca, 'YDir', 'normal', 'Clim', [-10 10])
c = colorbar;
ylabel(c, 'Elevation change (m)')
plot(Meas.gix/1000, Meas.gly/1000)
plot(ATarget.X/1000), ATarget.Y/1000, 'b', 'LineWidth', 2)
plot(ATarget.X/1000), ATarget.Y/1000, 'r--', 'LineWidth', 2)
plot(ASurfDep.x(:,[end, 2, 1])/1000, ASurfDep.y(:,[end, 2,
1])/1000, LineWidth', 2)
cmocean('balance')
xlabel(Northing (km)'), ylabel('Easting (km)')
legend ( 'Grounding line', 'AA^1 05 Nov. 2010', 'AA^1 11 Nov.
2014', '2016 surface depression extent', '2014 surface
depression extent', '2012 surface depression extent')
```

Allison loves to share science with others. In addition to presenting to peers at scientific conferences, Allison participates in several outreach initiatives each year to excite a diverse group of people about Earth Science. She strives to show young people that they can be scientists, too!
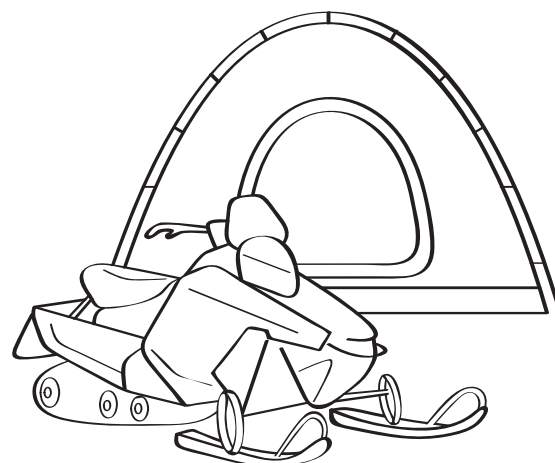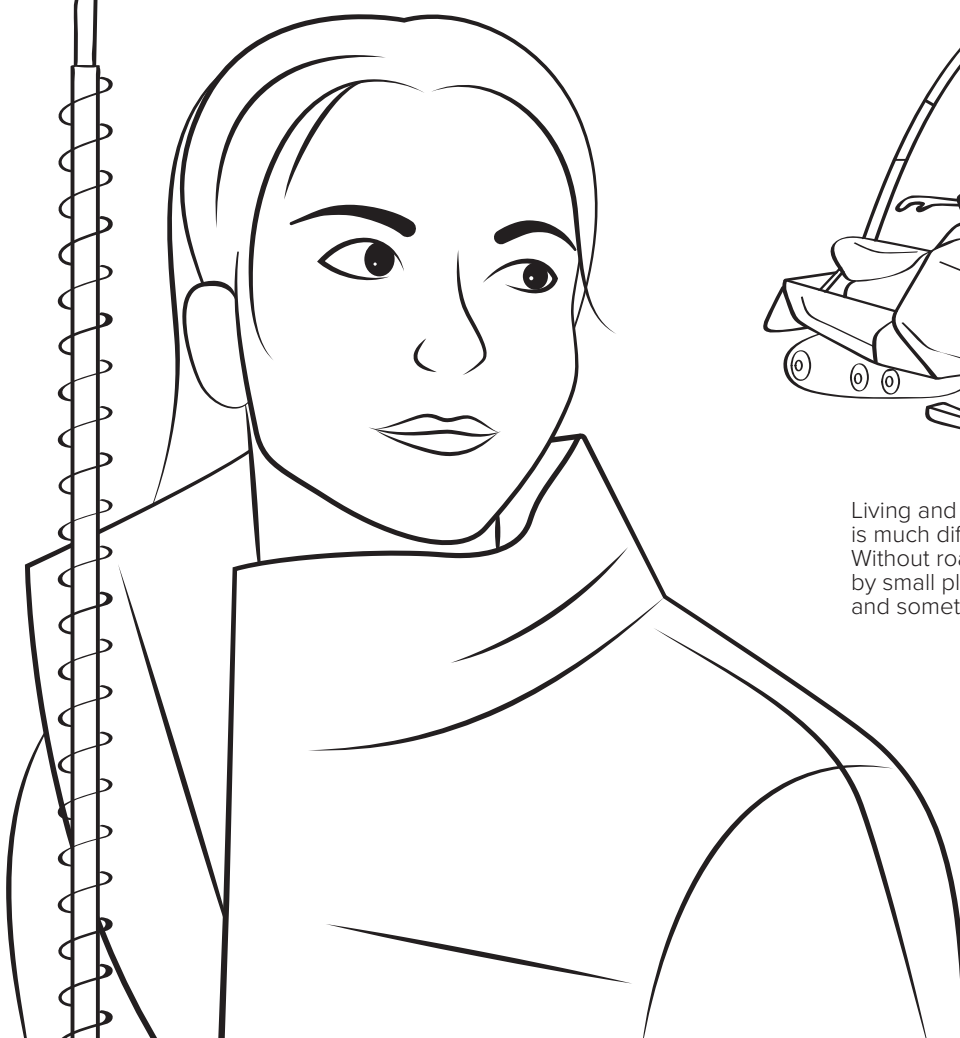
Allison Chartrand

Allison Chartrand is a Ph.D. candidate in the Glacier Dynamics Research Group at Byrd. She grew up in the glacially-formed hills of upstate New York, where she developed a love for frozen and liquid water sports — she once skied on snow and water in the same afternoon! Allison switched from a career in music to a career in science because of her fascination with glaciers, but she still plays French horn when she's not looking at ice.

Kangerlussuaq
International
Science
Support

Scientists use many different
instruments to monitor how
glaciers and ice sheets are
changing. Tools, like this
hand drill, help them install
special sensors below the
snow and ice surface.

Polar fieldwork requires careful
planning and support. In Greenland,
support centers like this make sure
scientists have all the necessary tools
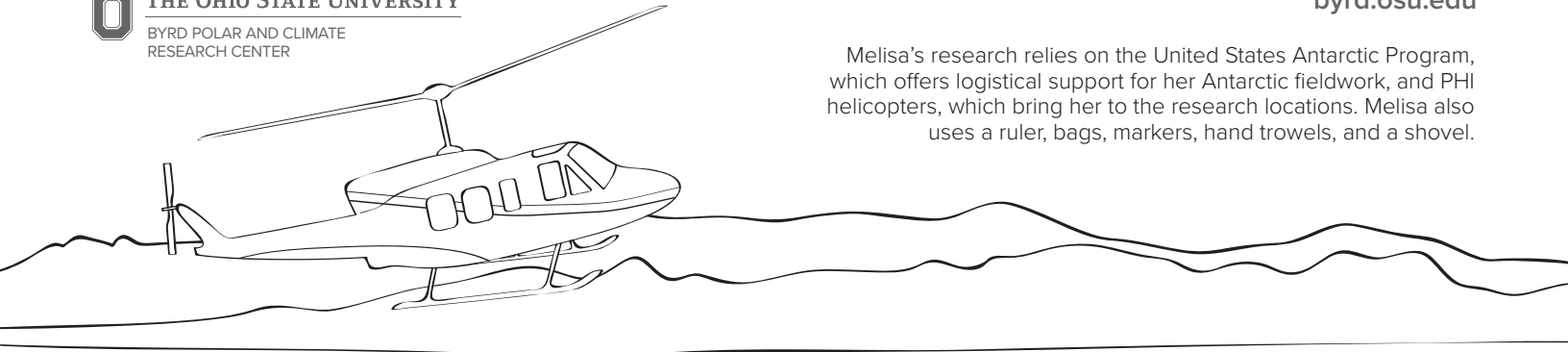and gear to do their work safely.

Living and working on the ice
is much different from home.
Without roads, scientists travel
by small planes, snowmobiles,
and sometimes even dog sleds.

To Michalea, small
details are what make
working on the ice so
special. She likes the
crisp air, the sound of
her boots breaking the
quiet as they crunch the
snow, and the way the
snow sparkles in the
sun in all directions.

Michalea King

Michalea grew up in rural Ohio and was drawn to science by watching the sky: she
enjoyed studying the stars through her dad's telescope and seeing clouds change shape
as they rolled over her family's farm. Now, Michalea is a scientist researching how Earth's
icy polar regions are changing. She has worked in Greenland, Antarctica, and Alaska.

Melisa's research relies on the United States Antarctic Program, which offers logistical support for her Antarctic fieldwork, and PHI helicopters, which bring her to the research locations. Melisa also uses a ruler, bags, markers, hand trowels, and a shovel.

Melisa looks at soils from exposed mountains along the Shackleton Glacier and works with biologists to understand how ecosystems responded to the advance and retreat of glaciers 20,000 years ago.

Shackleton Glacier research helps us understand how ecosystems structure and function in harsh environments.
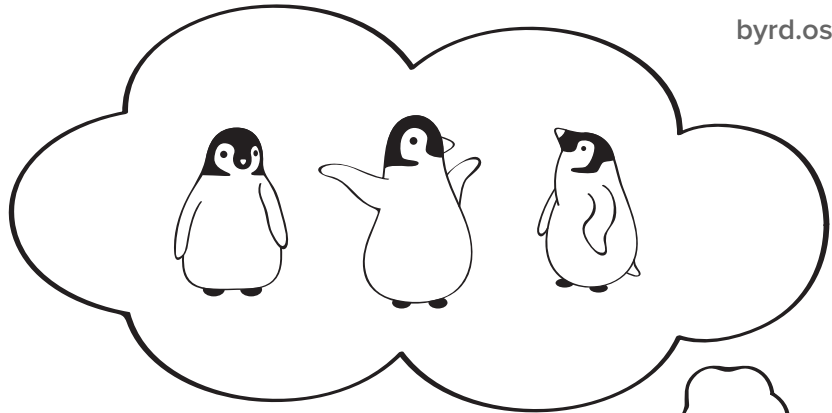
There are not many people of color in the geosciences, and there are even fewer in polar research. It is Melisa's priority to make the polar science community a welcoming place for future minority scientists. For Melisa, being a scientist means maintaining a curiosity about the world around her while also having fun.
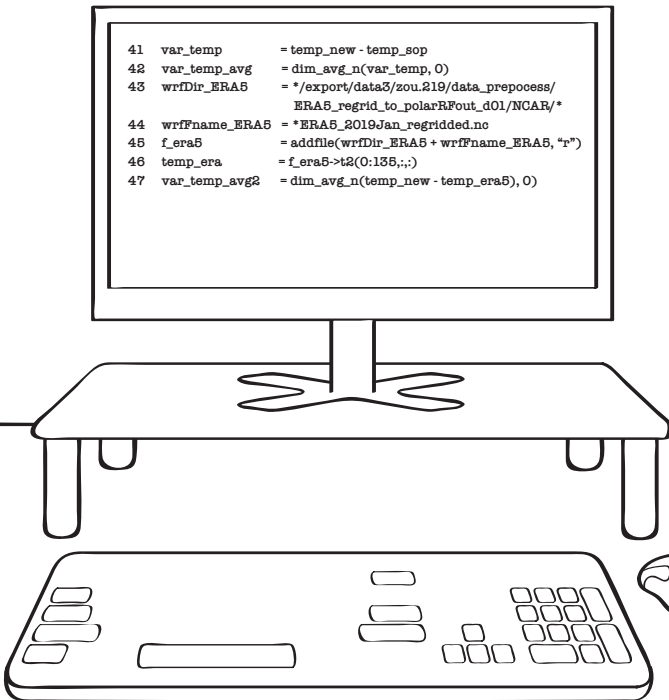
Melisa Diaz

Melisa is a Latinx Ph.D. student and a National Science Foundation Graduate Research Fellow at The Ohio State University. Native to Massachusetts, Melisa is a cat fanatic and avid juggler. She once juggled rock hammers on the Shackleton Glacier! Melisa's research focuses on the soil geochemistry of ice-free areas in the Shackleton Glacier region of Antarctica.

Joining Byrd was a life-changer for Jerry. She's learned about climate modeling and "black magic" in computer programming. One day, she hopes to go to Antarctica to see some penguins in their natural home!

Jerry doesn't work in the field. She works in an office and uses both desktop computers at the Byrd Center and supercomputers at the Ohio Supercomputer Center.

```
41   var_temp          = temp_new - temp_sop
42   var_temp_avg      = dim_avg_n(var_temp, 0)
43   wrfDir_ERA5       = "/export/data3/zou.219/data_prepocess/
                           ERA5_regrid_to_polarRFout_d01/NCAR/"
44   wrfFname_ERA5     = "ERA5_2019Jan_regridded.nc
45   f_era5            = addfile(wrfDir_ERA5 + wrfFname_ERA5, "r")
46   temp_era          = f_era5->t2(0:135,:,:)
47   var_temp_avg2     = dim_avg_n(temp_new - temp_era5), 0)
```
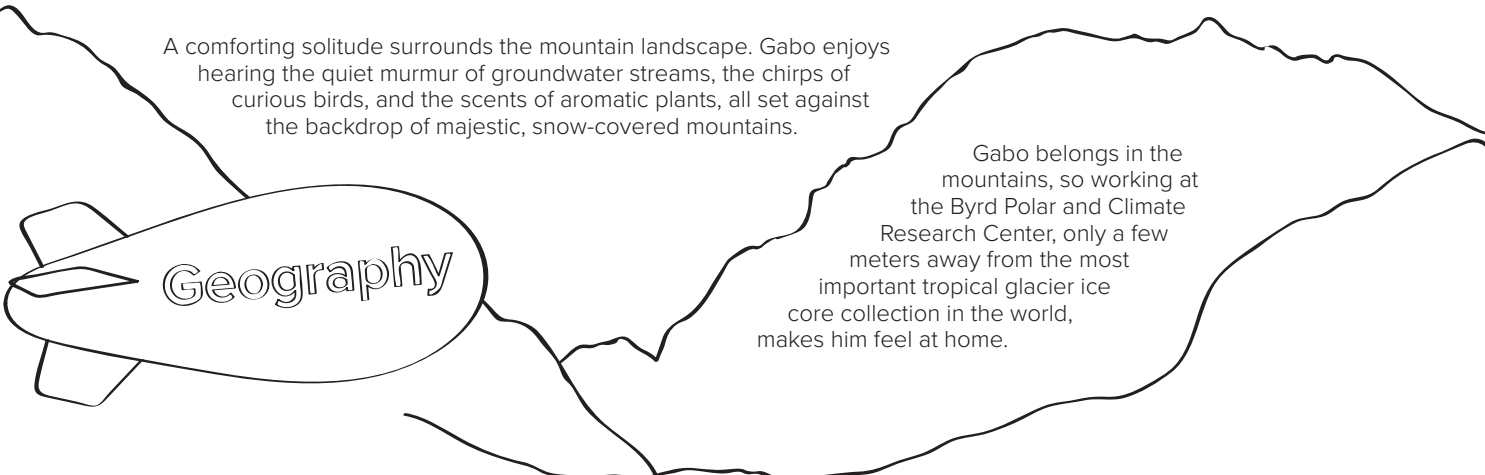
Jerry uses polar-optimized Weather Research and Forecast Models to simulate and investigate events where the surface of massive blocks of ice floating on the ocean, called ice shelves, melt.

Jerry's research helps us better understand why surface melt events happen in West Antarctica's Ross Ice Shelf. Faster ice flow from land into the ocean and global sea level rise are two effects of these melt events.
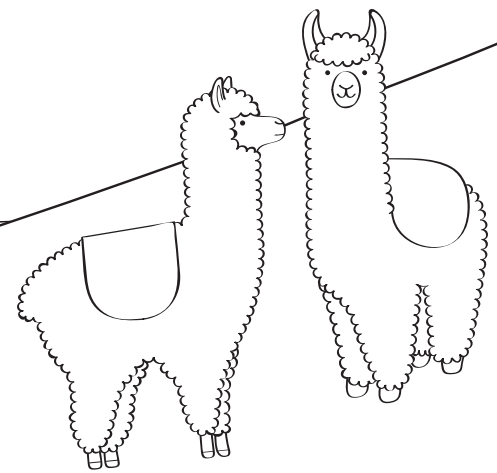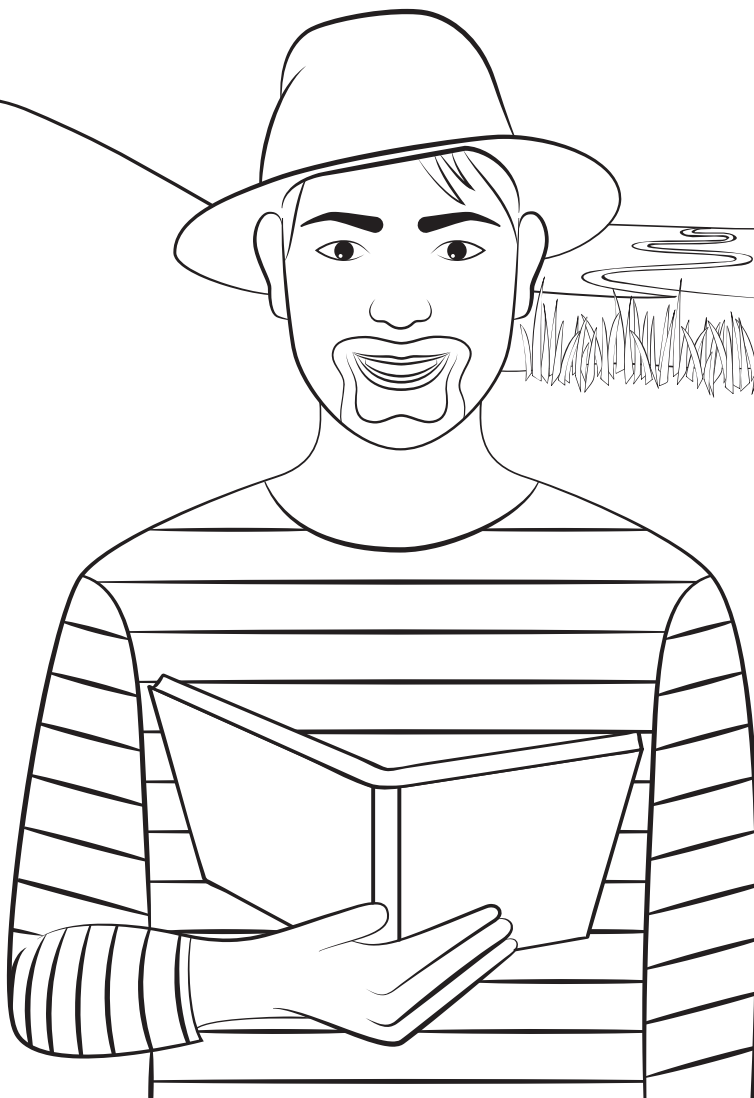
Jerry Zou

Jerry Zou, a graduate student in the Atmospheric Sciences Program of the Department of Geography, joined the Polar Meteorology Group at the Byrd Center in 2016. Jerry joined Byrd because of the Weather Research and Forecast technology — and because of all the penguin decorations around the building.

A comforting solitude surrounds the mountain landscape. Gabo enjoys hearing the quiet murmur of groundwater streams, the chirps of curious birds, and the scents of aromatic plants, all set against the backdrop of majestic, snow-covered mountains.

Gabo belongs in the mountains, so working at the Byrd Polar and Climate Research Center, only a few meters away from the most important tropical glacier ice core collection in the world, makes him feel at home.

Geography

Gabo's research focuses on mapping and describing the high altitude wetlands of the Tropical Andes. The mountain wetlands are deeply connected to the people living in the Andes, and now, because of climate change, these ecosystems need our care and protection.

While cameras, drones, spectral radiometers, and digital loggers have become essential in the study of mountain ecosystems, field expeditions still require nature guides, a good pencil, and an all-weather field notebook.
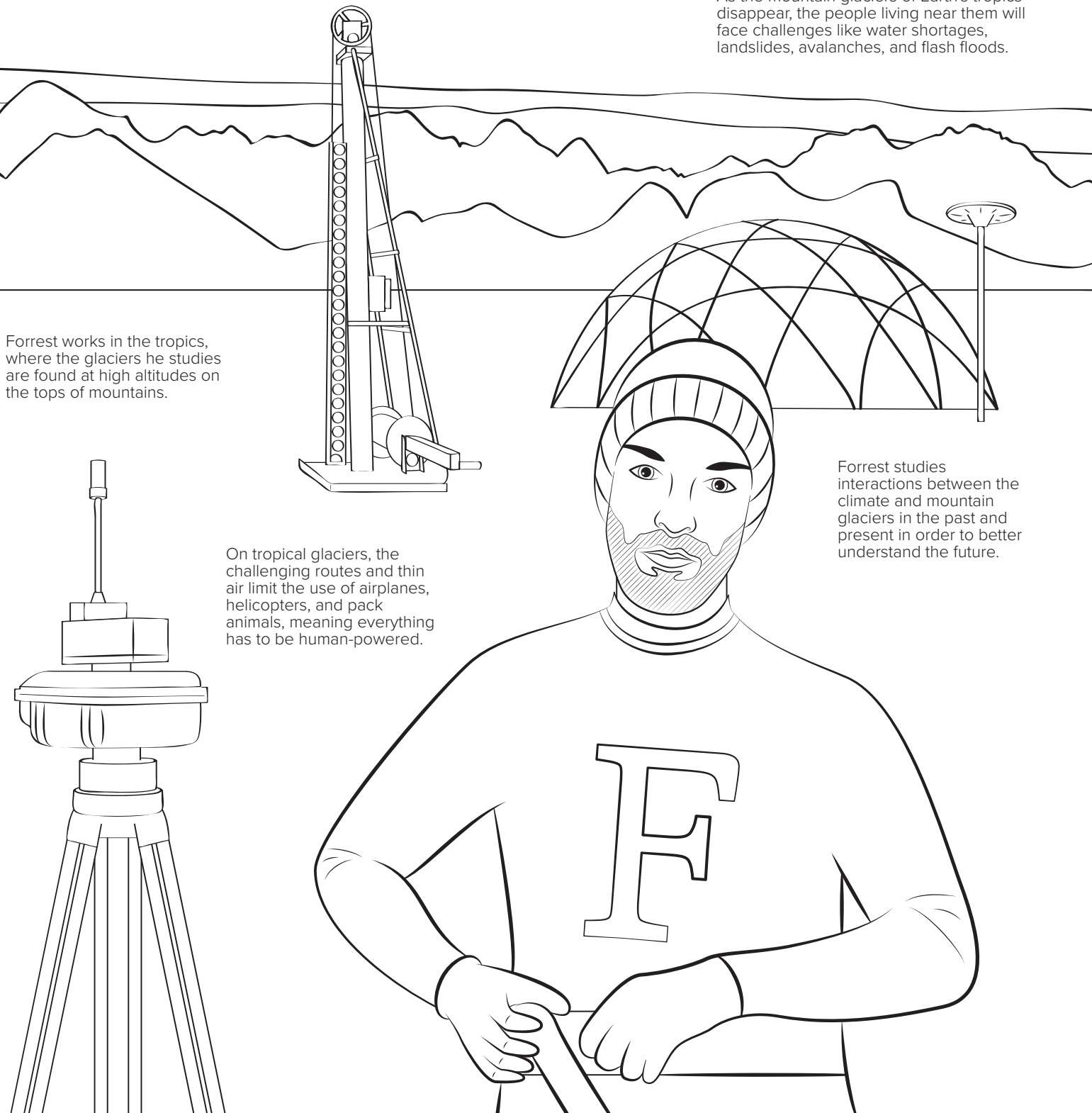
Gabo Zeballos

Born and raised in Bolivia, Gabo has a deep passion for the natural and cultural history of the Andes and the Amazon. Gabo is interested in social justice and climate change resilience. He likes old maps, the smell of new books, and he would never say no to a basketball game or a chess challenge.

As the mountain glaciers of Earth's tropics disappear, the people living near them will face challenges like water shortages, landslides, avalanches, and flash floods.

Forrest works in the tropics, where the glaciers he studies are found at high altitudes on the tops of mountains.

Forrest studies interactions between the climate and mountain glaciers in the past and present in order to better understand the future.

On tropical glaciers, the challenging routes and thin air limit the use of airplanes, helicopters, and pack animals, meaning everything has to be human-powered.
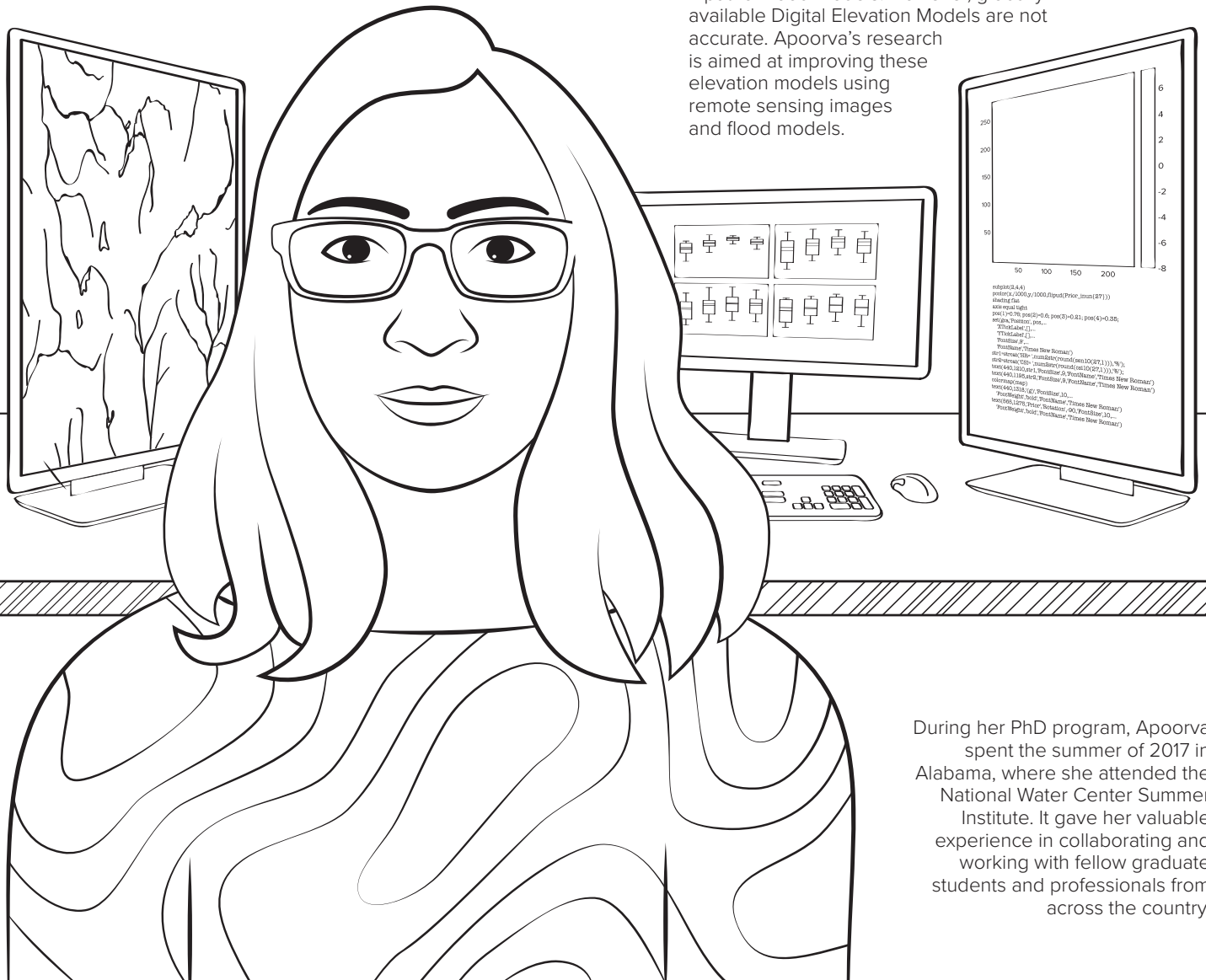

Forrest Schoessow

Forrest is a scientist and explorer who grew up free-range in the corn fields of Ohio. He's on a mission to understand and protect our home planet. When Forrest isn't in the laboratory, he's playing in the mountains.

Floods are one of the most common, widespread, and destructive natural disasters. Through her research, Apoorva strives to better understand floods and to mitigate their impact on people and society.

Apoorva has conducted flood research in the Logone Floodplain, Cameroon; Goldboro, North Carolina; and Tanzania. Since Apoorva's research is based on remote sensing and computer modeling, her most important equipment is a computer.

The arrangement of features of a landscape, called topography, is the most important input for flood models. However, globally-available Digital Elevation Models are not accurate. Apoorva's research is aimed at improving these elevation models using remote sensing images and flood models.

During her PhD program, Apoorva spent the summer of 2017 in Alabama, where she attended the National Water Center Summer Institute. It gave her valuable experience in collaborating and working with fellow graduate students and professionals from across the country.

Apoorva Shastry

Apoorva Shastry is an Earth Scientist with a background in hydrology and remote sensing. She is most interested in studying flooding, because of its impact on people and society, especially in a changing climate. Her research is focused on understanding the importance of topography, the arrangement of features of a landscape, in building flood models.