Fantasy World Map Making Handout
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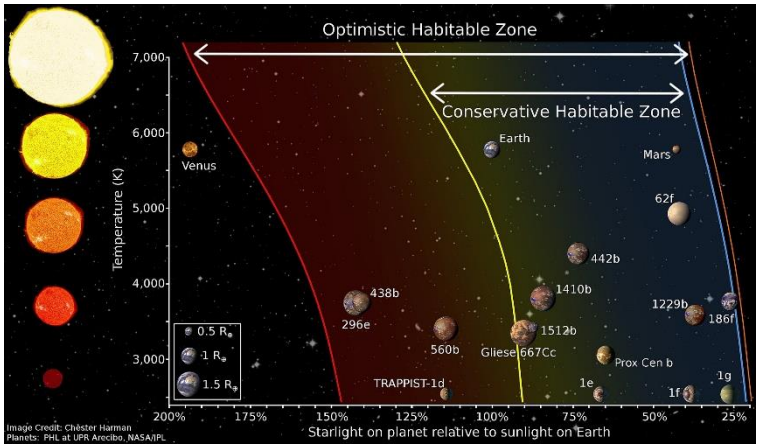
Storymakers 2023

The Heavenly Sphere



The Earth's Set Up:

Distance from the Sun:
92.96 million miles
Non-binary star
8 planets
1 moon
Spiral galaxy

My World's Set Up:

What kind of Galaxy is your world in?
What kind of sun?
How many moons?
How far from the sun?
How many planets?

For a random solar system creator, click here

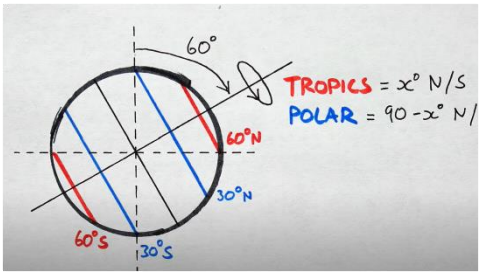
For more info on the Circumstellar habitable zone, check out this Wiki page.

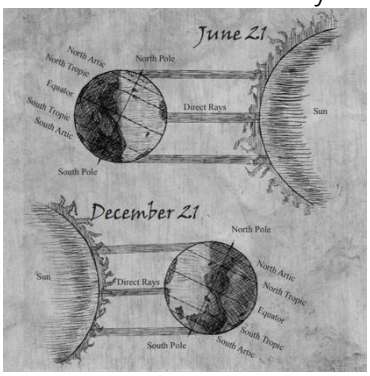
The Earth's Set Up:

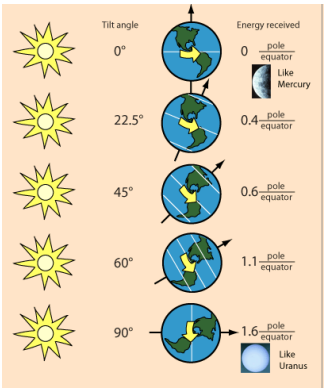
Tilt of the Earth: 23.5 °
Seasons
Artic zone: 66.5° latitude
Tropical zones: 23.5° latitude
Rotation of axis: 24 hours
Revolution: 365.25 days
Diameter of the Earth: 79,276 miles (12,756 km)

My World's Set Up:

What is your tilt?
What are your resulting artic, temperate, and tropical zones?
If drawing a regional map, what zone is it in?
Which way does the world spin?
How fast?
What's your world's diameter?







Notes, Sources, and Resources for Planetary Decisions:

- In arctic regions, you have one complete day of darkness and one complete day of light a year. The sun never sets in midsummer and never rises in midwinter. They get less direct light, are colder, and on our planet, have a lot of ice. The degree latitude where the artic zone occurs=90 minus the degree of planetary tilt, north and south respectively.
- In Tropical zones: the sun is directly overhead for one day of the year, and the weather is much hotter and wetter. The degree latitude where the tropical zone occurs=the degree of planetary tilt, north and south respectively.
- If you want to do a 0 degree or 180-degree axial tilt world, I suggest you check out this video (but recognize that life as we know it likely won't exist).
- I also like this article on a 0 degree world.

Practical World Building Tip: When you play with the tilt of your planet it changes the appearance of the sun in the sky. The higher the axial tilt, the warmer planet, the more extreme seasons, the great the humidity, the greater the rainfall & less ice at the poles. Reverse is true for a lower axial tilt.

- Also, the Axis Tilt is Critical for Life: "Although our viewpoint is certainly biased, our planet's tilt axis seems to be 'just right'". (Ward and Brownlee) Not only is the Earth's angle of tilt close to the optimum value, but it also seems to have been essentially constant. That is crucial for the development of advanced life. Since there are torques which could have caused the axis direction to change, it appears to have been the stabilizing effect of the Moon that has kept the spin axis in a stable direction to provide a stable climate for life.

Scale & Theme

Some Familiar Landmarks:
Diameter of the Earth: 79,276 miles (12,756 km)
North American Continent: 4,813 miles high x 2,610 miles wide
The U.S.A. is 2,500 miles across.
England is approx. 350 miles across and high.
Utah is 350 miles high x 270 miles wide.
Utah Lake is 12 miles wide x 21 miles high.
Mt. Timpanogos is 8.81 miles long x 5.3 miles wide

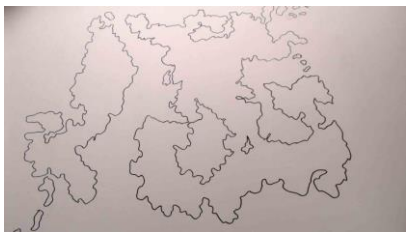
Suggested Scales:
Map of the word, use 1 inch=500 - 600miles
For a map of a Continent use 1 inch=200-400 miles
For a map of Eastern Europe use 1 inch = 100-200 to 300 miles
For a map of England use 1 inch = 20 to 50 miles
For a town map use 1 inch=ten miles
For a house map 1 inch=10 feet

For more measurements, go to Google Earth.
For a tutorial on how to maintain scales across several sized maps check out this Wonderdraft Tutorial: Consistent Map Scales by Landon Rivers

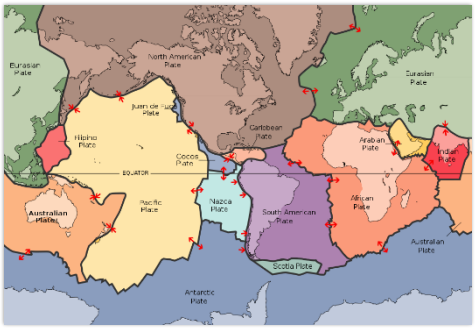
Continents and Coast Lines

Draw your continents and coast using fractal edges.
You can get inspiration from:

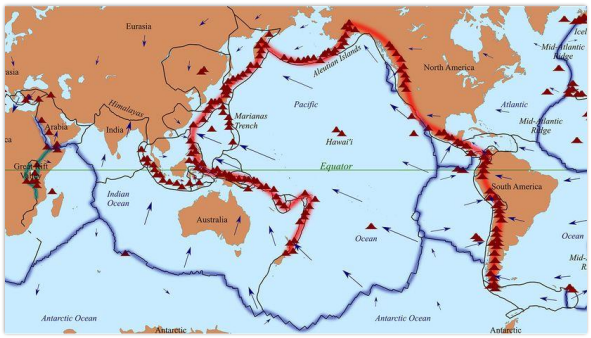
- snow melts
- beans on a piece of paper
- looking at google earth
- by using an auto-generated land mass from the Donjon Fractal World Generator
- Wonderdraft also has a "landmass wizard" tool
- Azgaar will also auto-generate coast lines

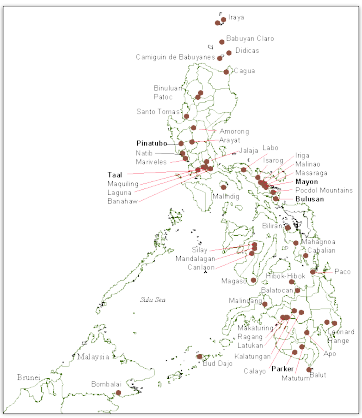


What the Plates are Doing	What kinds of plates	What they create
Convergent (Coming Together)	Ocean/Continent	Trenches, earthquakes, volcanoes, mountains
	Ocean/Ocean	Trenches, earthquakes, volcanoes, islands
	Continent/Continent	Trenches, earthquakes, volcanoes, mountains, islands
Divergent (Pulling apart)	Ocean/Ocean	Volcanoes, ridge, rift valley, volcanic islands
	Continent/Continent	Earthquakes, rift valley, volcanoes
Transform (Slide Past)	Continent/Continent	Earthquakes
	Ocean/Ocean	Earthquakes



Volcanos, Mountains, and some islands form along the convergent and divergent zones of tectonic plates and thus form a distinct, if slightly chaotic, pattern.





Where might your tectonic plates be?

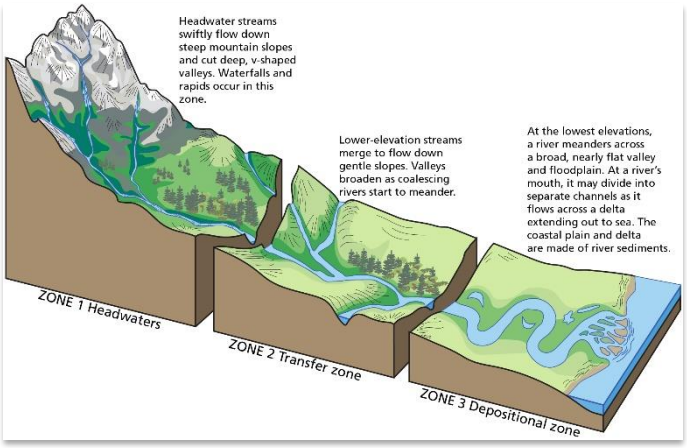
Practical drawing tips:

- No lonely mountains. Draw mountains and volcanos in lines and clusters.
- If you are creating a country or regional map, try and have mountains around 7-12 miles across. If you are creating a world map, mountains symbols should represent ranges (not individuals).
- Add islands along coast lines, or as a part of a volcano cluster.

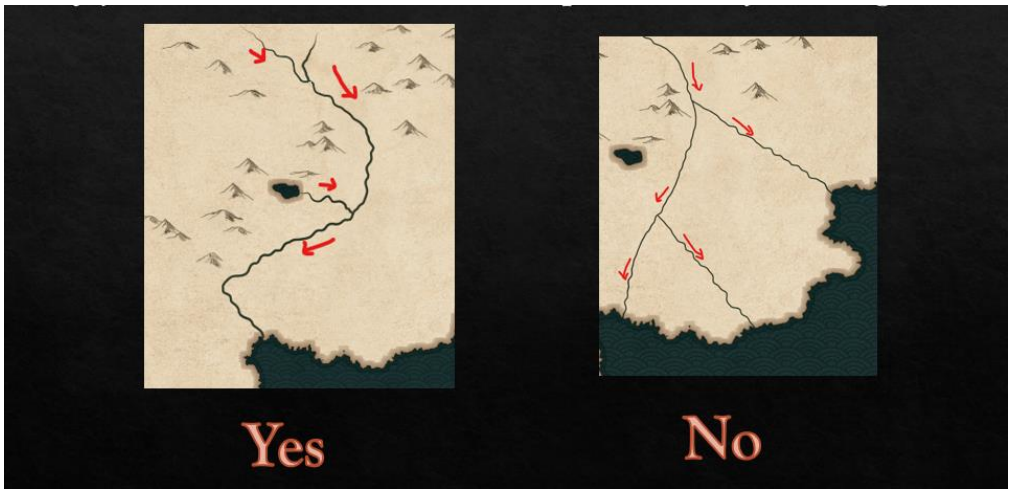
Sources and Resources:

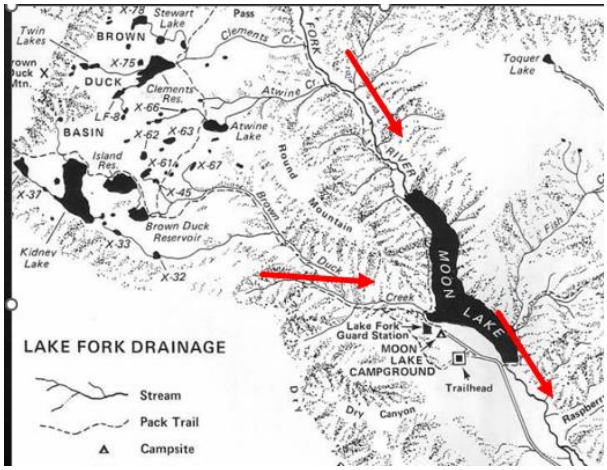
- This fantastic video on Fantasy Maps & Plate Tectonics:
- And this video: How to Draw a Fantasy Map (Part 2: Mountains) by WASD20

Water gathers at high points (mountains) and moves to low points, valleys, rivers, lakes, ocean)



Practical Drawing Tips: Rivers don't (generally) split as they flow. Water seeks the low point and join together. Exception: Deltas and declining rivers. NO coast-to-coast rivers. Lakes have one draining point (or none).

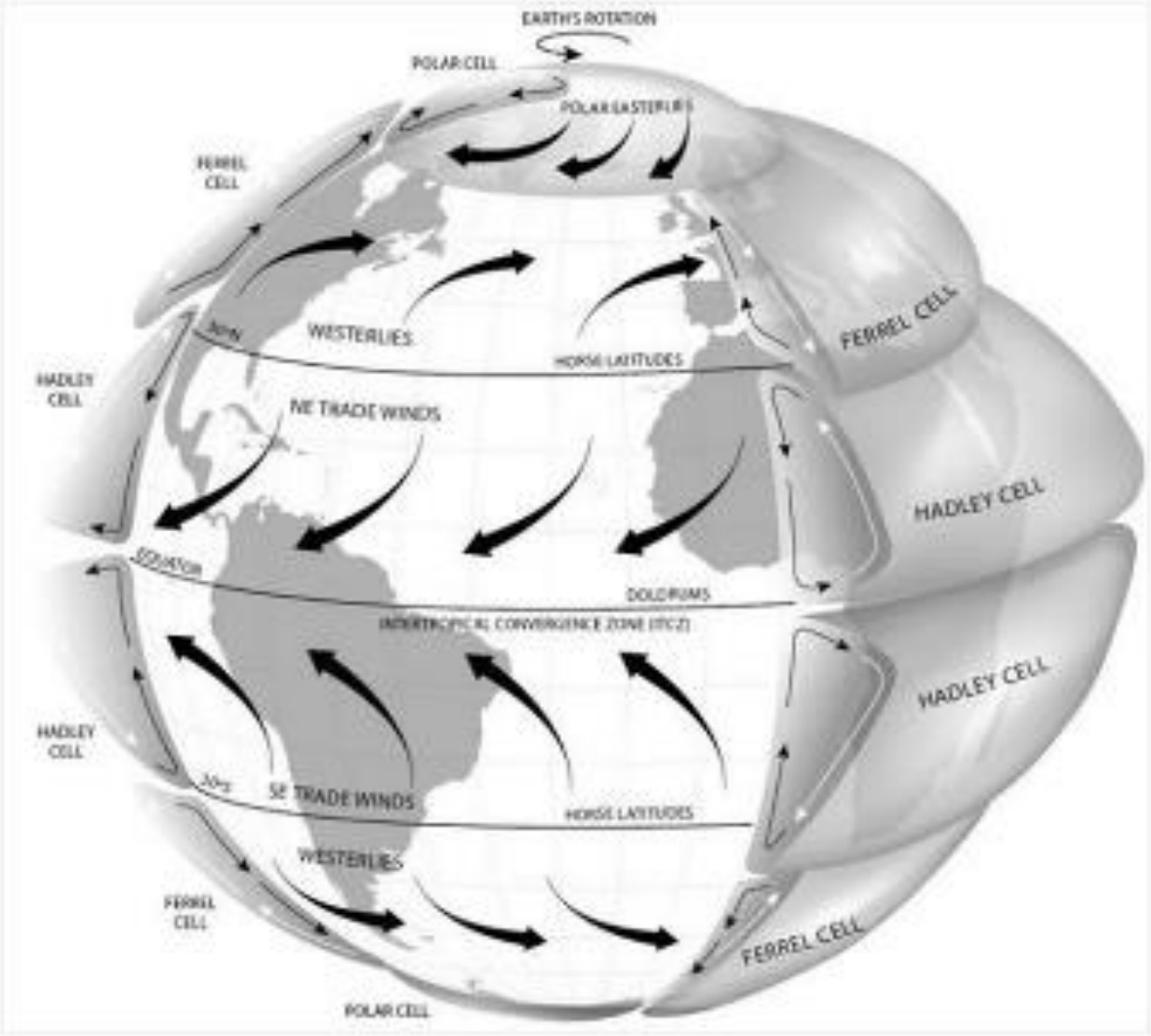




PREVAILING WIND

Wind is created by the movement (spin) of the world:

- At the equator, the air is heated far more than at the poles, so it disperses north or south. If the earth did not rotate, we would have one large Hadley Cell, circulating from equator to pole, for both the north and south hemispheres, with the hot air rising at the equator and the cool air cooling at the poles. But because the earth is rotating at a dizzying 1,000 miles/hour, the northward moving air curves west for the Hadley Cell, East for the Ferrel Cell, and west again in the polar cell. This is the "Coriolis Effect".



Want to see the Coriolis Effect in motion? Check out this video.

Steps to be Taken: What latitude are you at? Which way is your prevailing wind moving? Assuming your world is spinning at the same rate as earth, you now know your prevailing wind, as dictated by your latitude. Mark it on your map.

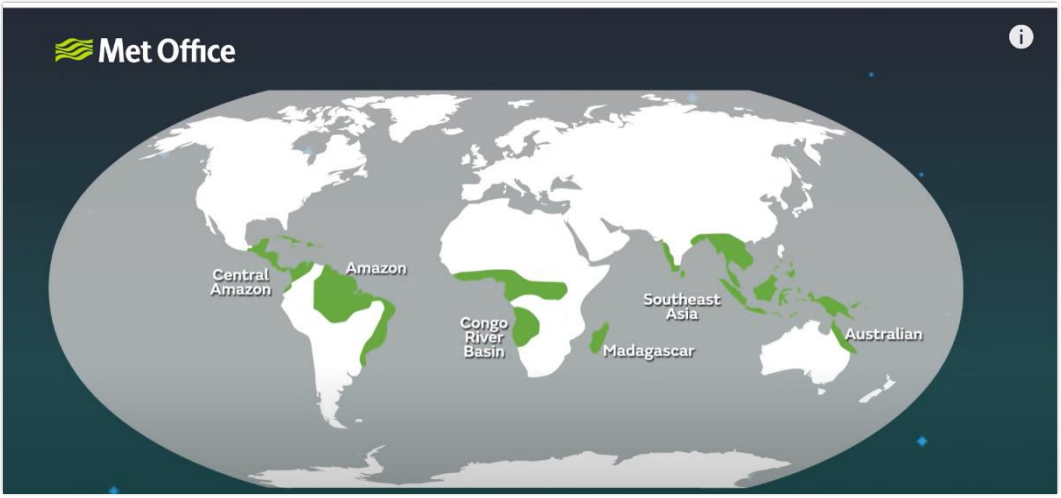
Trade Winds: gentle steady and diligent

Westerlies: fierce and furious

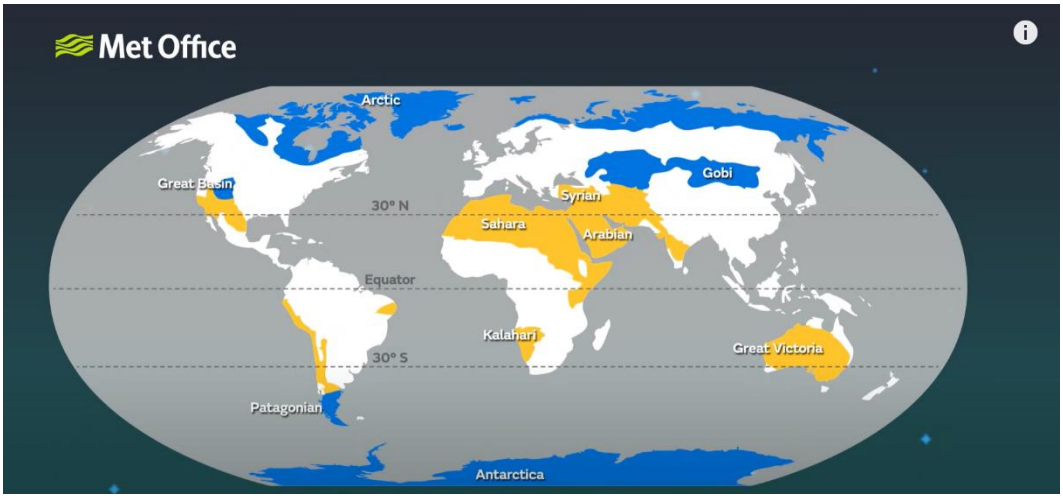
Wind Moderates the temperature of the World.

When you change the spin of the earth: if your planet rotates clockwise (vs. the counterclockwise direction earth spins) you'll still have the same wind patterns but opposite directions. But what if it rotates slower? The slower a planet rotates, the less circulation cells it will have. Want to know how a tidally locked planet will behave? Or be able to calculate a planet's Hadley Cell's when it spins at ¼ or double earth's speed? This is your video: "Atmospheric Circulation: Wind, Weather, and Mordor" by Artifexian

Practical Drawing Tip: Deserts are commonly found along 30 degrees north and south. Tropical Climates are generally found near the tropical convergence zone near the equator (assuming earth-typical rotation). Does this explain all deserts? No. A few deserts, such as the Gobi Desert in China, are simply a result of being located far from the ocean, from which most atmospheric moisture is drawn. The moisture is precipitated before it can reach these interior areas. For more info, click here.



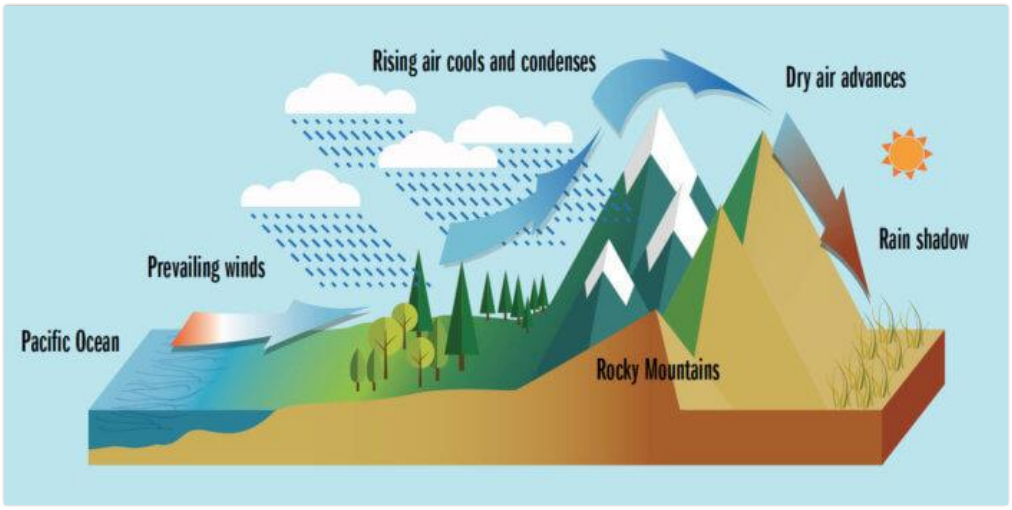
Green: Tropical Climates



Brown & Blue: hot and frozen deserts

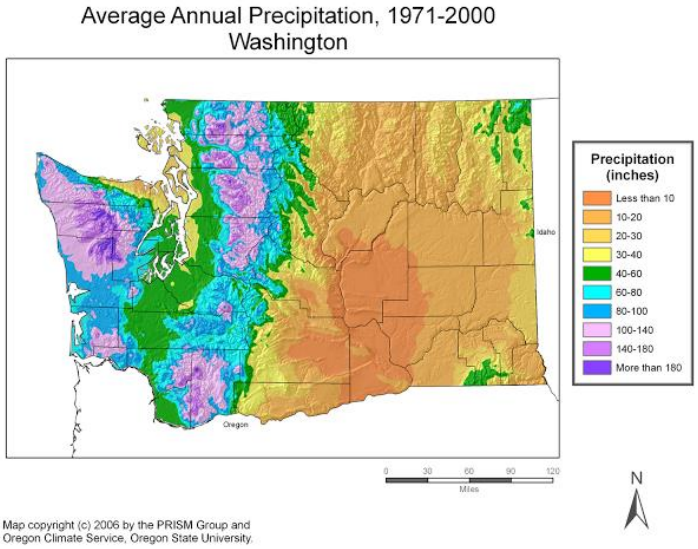
Source of images (and for more info): What is global circulation? By Met Office

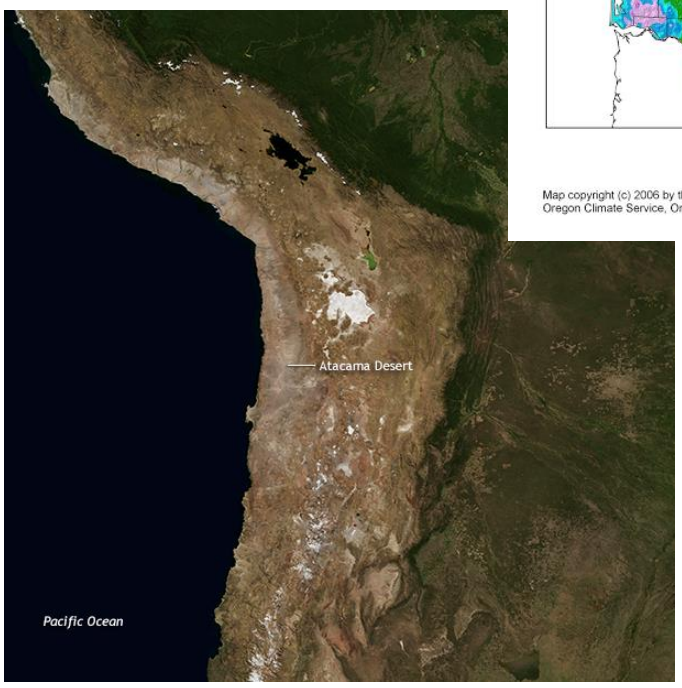
RAIN SHADOWS



When there is a prevailing wind moving off a large body of water as it hits the mountains, it releases its moisture. The other side of the Mountains is very dry. Example: Washington, Hawaii, Himalayas, South America

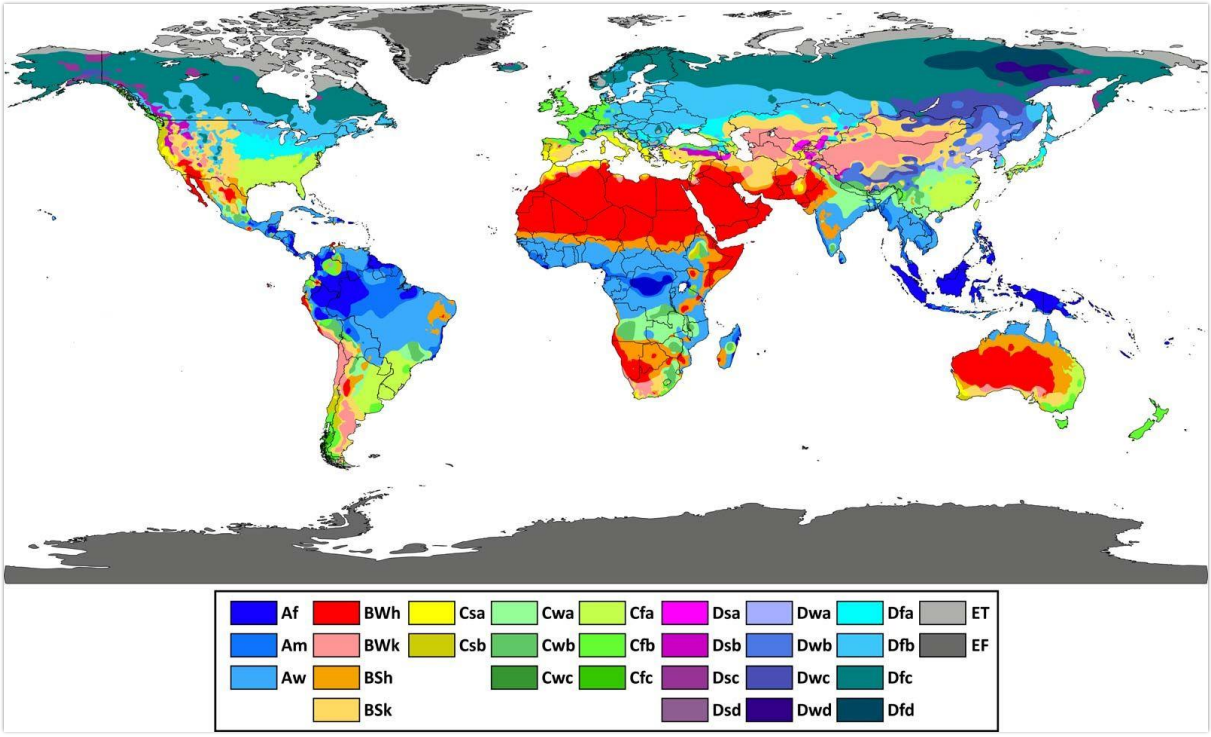
Steps to be Taken: Now that you know your prevailing wind, you can predict where the rain shadow will be. Draw one side of the mountains green, the other brown.





BIOMES

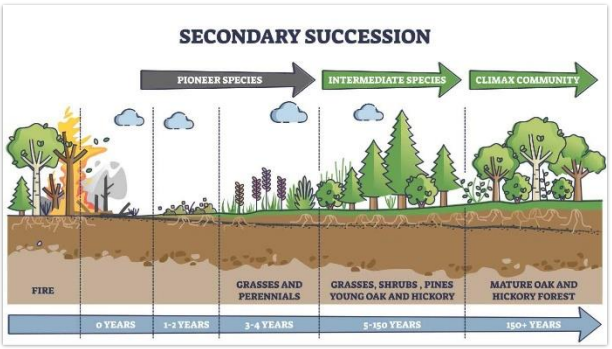
When creating biomes (plants, animals, etc) use the Koppen climate classification



guide and steal like an artist.

If you want to determine your worlds climates by hands, here's a great resource: [World Building: How to Build Realistic Climates #1]

Practical Drawing Tip: With plants, microclimate really matters. Species gradually shift as you move inland, move up a mountain & over time. And, as with drawing coast lines, use fractal edges when drawing forests.



SETTLEMENTS

Before placing a settlement, ask **why would people live here**? Is there fresh water, food, shelter, fuel, building materials and transportation? Nearly 2.4 billion people (about 40 per cent of the world's population) live within 100 km (60 miles) of the coast. Population density is also influenced by annual average rainfall.

Each dot on this map equals 1 million people, as of 1880 C.E.
Map source: https://worldpopulationhistory.org/

Practical drawing tip: Port cities are generally found a little bit inland, in areas sheltered from the wind and rough waters. Also, general have a deep-water harbor and are mostly likely to be ice free year round
Example: Seattle and Portland, which are found inland from the Ocean

Software Comparison

Wonder Draft	Incarnate	Azgaar World Generator
		
Creates beautiful customizable maps that would look wonderful in any Indie Published Book. Great for those who get a thrill out of world building with beautiful results or for those whose stories include a lot of traveling (where the measuring tool will come in handy).	*Quicky, easy, and free version that I have used for many years to keep myself from making gapping plot holes with my (previously haphazard) geography. Free to try out, but with limitations.*	*Complex and realistic map generator with layers upon layers of information. Customization has a higher learning curve and time requirement--and is endless. However, if you're looking for a ready-made-world with all the information you need for you to start your first draft, this is your program.*
Cost: 1 time purchase of 29.99;	**Cost:** Free version has basic images; Pro version is $5/month or $25/year.	**Cost:** Free; Considering joining Patrion for $5/month
Features: 10 built in "themes." Downloadable software Unlimited Maps 1,800 Art Assets Off-line Access 10 Type faces Custom Art Assets Platforms: windows, apple, Linux	**Features:** 5-6 built in themes. Browser-based 10 free maps in free version; 1.5k with pro version. 900+ art assets with free version; 20k with pro subscription 10 Typefaces Custom Art Assets (with subscription)	**Features:** 10 built in "styles." Browser Based Unlimited Maps 50+ Art Assets 47 type faces Custom Art Assets
Other Features: Landmass Generation Automatic Coastlines Ground Painting Rivers (tapers automatically) Paths tool (dots, lines, arrows) Built in labeling for cities.	**Other Features:** Ground painting Community Sharing	**Other Features:** There are many "layers" of information generated with every map: heightmap, biomes, rivers, prevailing wind, religions, cultures, temperature, population, military, etc.

Grid, Scale, & Measuring Tools		The cities are auto generated and include the annual temperature, the elevation above sea level, the population, etc. Each layer can be customized, and it is easy to continue generating until you are satisfied.
Can I use this in my book? No DRM (digital rights management) - legal access to content & no additional fees or royalties to use maps for books, websites, etc. Maps can be exported. Extras: Pirates Pack, Fantasy Buildings ($10 each)	Can I use this in my book? Commercial use allowed with subscription. Maps can be exported	Can I use this in my book? The maker of Azgaar does say that these maps can be used without concerns about copyright (but it's not listed on an official website). Maps can be exported

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Software Tutorials

"How to Use Wonderdraft" by Avant Novis, August 29 2022 Tutorial on YouTube

"Inkarnate – Let's Make a Fantasy Map! (free version)" by WASD20 on YouTube

"Azgaar's Fantasy Map Generator Tutorial Part 1: Basics and Creating your Own Map" by Bepis

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Further Sources and Resources

The Writer's Map: An Atlas of Imaginary Lands, by Huw Lewis-Jones. A collection of essays and maps, both fantastical and historical, that will tickle your creative senses. One of my favorite books of the year.

A Magical Society Guide to Mapping, by Expeditious Retreat Press. A free 37-page pdf that goes through the process of building a world. It can be found here.

An Ocean of Air by Gabrielle Walker. This is one of my favorite nonfiction reads of the last year and is written by an editor of the magazine "Nature". All about how the nature of our atmosphere was discovered by many centuries of scientific experiment, it is both well written and fascinating.

To see a ball float on "liquid sand" like the ships in *Tress* by Brandon Sanderson, check out this video.