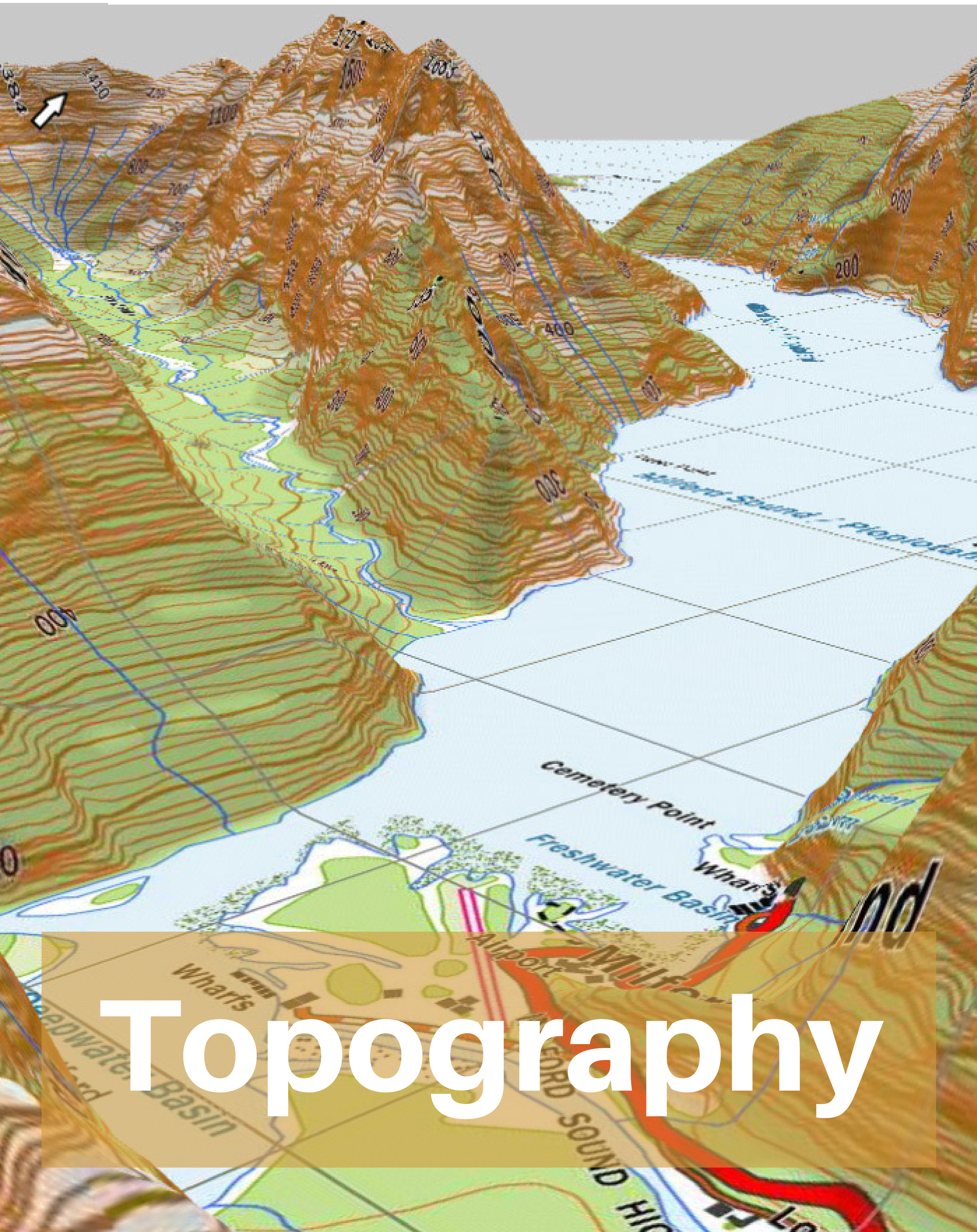
Agrifutures



Topography

Understanding Topography

When looking at topography our brains need to extrapolate out the lay of the land to see in 3-dimensions. They help us to see when landscapes are steep and when they are gentle. You see ridges and valleys and you need to be able to see these conditions not in 2D, like the map, but in 3D. They show the curves of nature as water and weathering has sculpted the landscape.

Thus, when you go to read a map, when the lines are spaced close together, that means there is a rapid change in altitude indicating a greater percentage of slope. This affects how water flows as the steeper the hillside the more likely we are to have erosion.

Also, it changes our earthworks capabilities as you move up in steepness swales are not possible and then we need to go to terracing when such earthworks are really needed. If contour lines are spaced really far apart then the land is quite gentle and approaching flat.

A topographic map, simply put, is a two-dimensional representation of a portion of the three-dimensional surface of the earth. Topography is the shape of the land surface, and topographic maps exist to represent the land surface.

Topographic maps are tools used in geologic studies because they show the configuration of the earth’s surface. Cartographers solve the problem of representing the three-dimensional land surface on a flat piece of paper by using contour lines, thus horizontal distances and vertical elevations can both be measured from a topographic map

• Map Scale: Maps come in a variety of scales, covering areas ranging from the entire earth to a city block (or less).

• Vertical Scale (contour interval): All maps have a horizontal scale. Topographic maps also have a vertical scale to allow the determination of a point in three-dimensional space.

• Contour Lines: Contour lines are used to determine elevations and are lines on a map that are produced from connecting points of equal elevation (elevation refers to height in feet, or meters, above sea level).

Maps

Contour maps make a valuable tool for understanding the elevation of your land and surrounding terrain. Contour lines are lines drawn on a map connecting points of equal elevation, meaning if you physically walked along the contour line, your height above sea level would remain constant.

In order to keep things simple, topographic maps show lines for certain elevations only. These lines are evenly spaced apart. We call this spacing the contour interval. Different maps use different intervals, depending on the topography and how precise the mapping needs to be.

To make topographic maps easier to read, every fifth contour line is an index contour. Because it's impractical to mark the elevation of every contour line on the map, the index contour lines are the only ones labelled. The index contours are a darker or wider brown line in comparison to the regular contour lines. You'll see the elevations marked on the index contour lines only.

To determine elevations, pay attention to the amount of space in between lines. If the contours are close together, you're looking at a steep slope. If the contours have wide spaces in between -- or aren't there at all - the terrain is relatively flat.

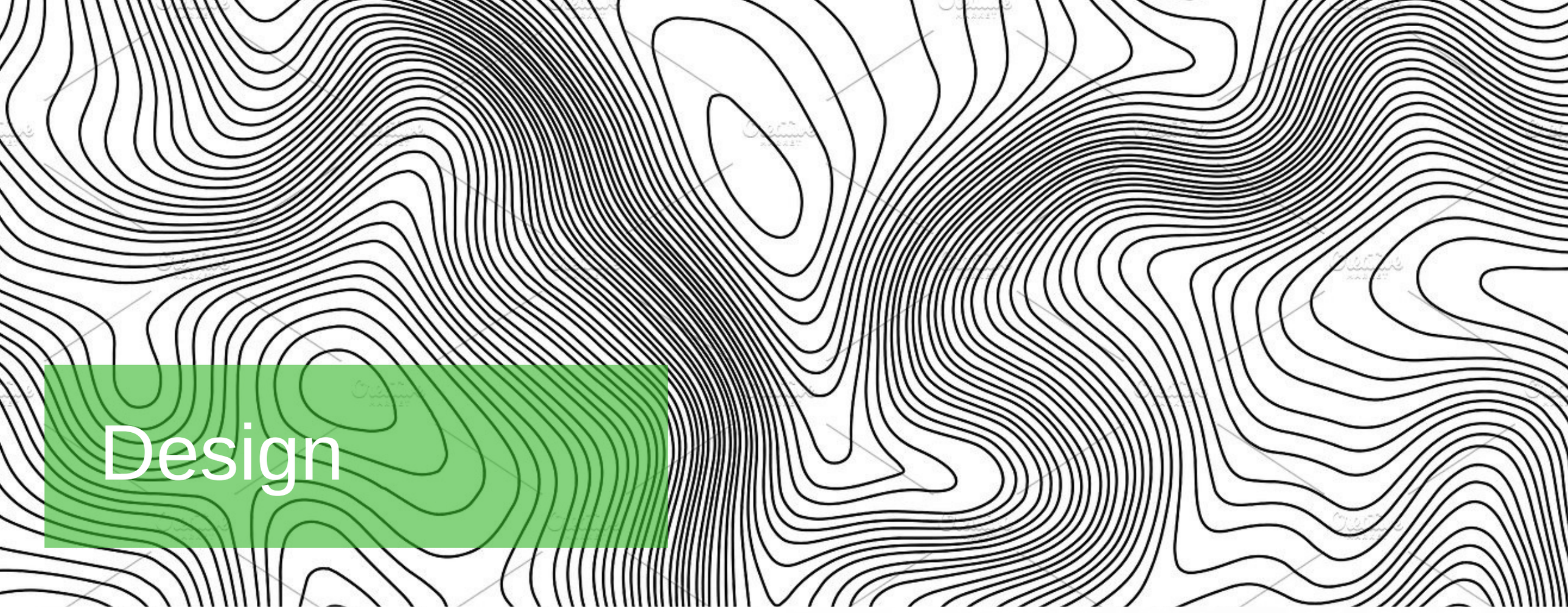
Design

Maps allow us to better plan earthworks, tree crop systems, rotational grazing, and to layout housing development amongst others. However, they are maps only, not the territory itself, so planning on a map can only get you so far because the in the field feedback will always cause variations no matter the accuracy of the map.

A map can help with a diversity of tasks around planning; before, during, and with the implementation. If done to scale one can figure out accurately just how many trees are going in, how long say a swale will be, catchment size, or where a house would fit perfectly in with all the other stuff going on already.

Thus, once a base map is created, analysis tools like sectors and flows are done. Our sector and flow analysis help us to put in a windbreak or know when an earthwork like a rain garden should be placed.

Then the schematic part comes out and dictates where a bubble-like food forest will go. Then you refine that idea more and do a detail design and determine exactly the numbers of trees and when and where they will go (design process).



Design

Understanding the way that mountain ranges interact with weather and the way that atmospheric moisture moves from the oceans into the interior of continents is an important macro-pattern to understand in order to answer the “where am I?” question.

The shape of the land and how a topographic feature like a mountain range is oriented in relation to the sun and bodies of water will tell us a lot about where we are. The side of a mountain range that is facing the direction of prevailing weather gets more precipitation, and creates a “rain shadow” on the other side. As we go from the ocean into the interior of the continents, it gets drier. Tall mountains intercept weather moving through and can store snow at high elevations to slowly release into rivers below.

Slopes in the land are beneficial and gives you the opportunity to store water high in the landscape to allow gravity to reticulate it further down rather than expending energy and needing to pump.

However, if your slopes are over 20 degrees you'll have limited options for utilization and it will be very difficult to put in productive systems without a lot of expensive earthworks. Steep slopes like these are best left to regrow as a forest. In contrast, flat land can be really productive, but without any slope at all they can become subject to strong winds and flooding. Most importantly, they simply don't have any potential for gravity-fed irrigation.

You want also to look at the orientation of slopes, this aspect is very important to consider and it needs to be favourable in relation to the location's climate.

In most cases, you'll want a north-facing slope (southern hemisphere) or south-facing slope (northern hemisphere). East-facing slopes are the second-best choice in case you can't get the south facing one. You'll simply want to maximize your sunlight exposure unless you're in very dry arid conditions.