Subject: Re: GB Isolation file
Date: Friday, June 16, 2017 at 3:28:27 PM Pacific Daylight Time
From: Andrew Fall
To: Morgan, Don ENV:EX

Hi Don,

I just posted two files that try to get at the isolation indicators you want (one by GBPU and one by LU).

Each has one row per unit (GBPU or LU) that has:

(a) total area (in focal GBPU's only, excluding areas with no Trout Unit and salt water)

(b) number of internal (Int) and external (Ext) links. Each external link is counted as 0.5 to the GPBU/LU at the end points. Internal links contribute a 1 to the unit it is within.

(c) linkNetClsPctInt_1 ... 4: this is percent (Pct) of internal links (Int; links between hexagon centres that are entirely within the GBPU/LU) that are in isolation class 1, 2, 3 or 4 relative to the natural base case (Net).

(d) linkNetClsPctExt_1 ... 4: this is percent (Pct) of internal links (Int; links where one end is in the GBPU/LU and the other end is in a different GBPU/LU) that are in isolation class 1, 2, 3 or 4 relative to the natural base case (Net).

Making these relative to the natural base case (no roads or other infrastructure) accounts for inherent isolation due to ice and lakes.

At present the classes are as follows, based on how much human disturbance has extended path cost/length relative to minimum link length (i.e. straight-line path). To net out the natural isolation, we subtract it's contribution. The actual function is:
link isolation rating = 1 / ((link cost / min. length) - (natural link cost / min. length) + 1)

1 (very isolated): link isolation rating < 0.25 (i.e. deflection is more than 4 times)
2 (isolated): 0.25 <= link isolation rating < 0.5 (i.e. deflection is between 2 and 4 times)
3 (moderately isolated): 0.5 <= link isolation rating < 0.75 (i.e. deflection is between 1.33 and 2 times)
4 (connected): 0.75 <= link isolation rating <= 1 (i.e. deflection is less than 1.33 times)

Cheers,
Andrew

On 16/06/2017 9:41 AM, Andrew Fall wrote:

Hi Don,

I thought I would focus first on the isolation file before diving into roads.

I re-ran the connectivity assessment to use the revised GBPU layer and output only for the focal 8 GBPUs (clipped to remove areas with no Trout Unit and salt water). The results are of course similar to those that I sent by email on April 18 (SkeenaNass_GBPU_Isolation), which I have uploaded to the Dropbox (18April2017 folder). I also uploaded the Powerpoint slide I created.

Rather than upload the new results, it would be better to clarify what exactly is needed.

The indicators that you seek are:
- % boundary isolated
- % internally disconnected

The file posted has the outputs that are currently generated for "current conditions" and "natural base" at 5 hexagon size scales (1km2, 10km2, 100km2, 300km2 and 1000km2). Direct results for each scale on are separate tabs.

Question 1: Which hexagon scale(s) do you want to use? The analysis I did in April suggested that the 100km2 scale best captures the expert opinion ratings. But other scales can be included as well.

Question 2: How do you want to define "% boundary isolated" and "% internally disconnected"?
These could be defined as the % of external links (i.e. that cross the GBPU or LU boundary) or internal links that have increased cost (due to crossing high cost areas and/or being deflected to follow longer paths to avoid high cost areas) above a certain threshold? In this case, the links could be classified into categories (well-connected links, moderately-connected links and poorly connected links) and the % of links in each category would reflect the boundary.

Right now, the overall average link costs each GBPU (or LU) is assessed. 1 means all paths are straight line through lowest cost areas, and larger values indicate increasing isolation. The "rating" is basically just the inverse of the mean link costs.

We can perhaps talk about this in a while. I need to go feed the sheep, but will be back soon.

Cheers,
Andrew