

The Reviewer's direct comments to the manuscript:

Note: Here we have skipped the Reviewer's discussion regarding why this paper is not relevant since we already provided our arguments in the main response.

| Comment | Our response |
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| Why the distinct asymmetry in corporate recognition? A reader sees 'Google' constantly but 'Microsoft' almost never? | We will correct this by inserting "Microsoft" in the appropriate places. |
| The data table downloads easily and opens in Excel, Google spreadsheet, Numbers, etc. Authors used a 1 degree search algorithm. Global 1 degree is 360 by 180 but assume no data at latitudes poleward of 80N and 60S so 50,400 possible data points, assume 30% land, gives 15,120. Data table has 20 header rows followed by 15368 rows of lon lat data. Assuming many interior data voids (northern Canada, Siberia, Greenland) combined with substantial overlap of Google Earth and Microsoft Bing in data rich regions, 15,000 rows of data seems about right? But header (row 19) lists 59,168 data points. At each of 15,000 lon lat points, Google Earth presence absence, Microsoft Bing presence absence, and date of most recent Google Earth scene, gives about 60,000 values? | Thank you for this observation. We double checked the number of records and there are a few missing rows. We will update the data set on Pangaea. |
| Too many of these types of punctuation errors: "Bing Maps (Fritz et al.,." Occurs due to intersection errors between reference software and word processor. Authors should have searched and fixed these beforehand. | We will correct these typos. |
| Page 2, line 5: LANDSAT operates jointly by NASA and USGS. Most researchers interact with USGS because they manage data distribution. Present fuss about charging again for Landsat images - a spectacularly bad idea possibly fatal for the use of Landsat products in earth system research - centres on US Dept of Interior and USGS. | We will add this point to the discussion. |
| Page 2 line 7: "still covered by Landsat resolution imagery, i.e. 15 m when pan-sharpened." Because Landsat resolution has evolved both in sensor resolution and data availability, not clear to readers which Landsat resolution the authors reference here? Same text and same problem on Page 17 line 15. Most recent Landsat 8 visible at 30 metres or panchromatic at 15 metres? | Thank you. We will correct this in the text. It should be 15 meter resolution visible. |
| Page 2 line 21: the demise of the Google Earth API/plugin occurred earlier for some browsers? Google announced it as early as 2014 or 2015? Do the authors address the issue of tracking image time series from this point forward, e.g. following the loss of the API tool? | We will add this limitation to the discussion along with potential solutions. |
| Page 6 Figure 3. Potentially useful figure but colour scheme detracts? Very hard to distinguish Google only from Bing only, and which most recent. Probably not accessible to colour-blind users. Consider a different colour scheme with much higher contrast? Category Google only also represents Google more recent by | We tried a number of different color schemes and chose what we felt was the most contrasting. Regarding color blindness, we did not use red and green |

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| <p>default? Likewise for Bing? Very difficult to view and accept the authors' conclusions about Australia, for example, from this plot. This reader estimates perhaps 60% Bing vs 40% Google for Australia, but with Bing predominant in the central outback while Google coverage dominates the agricultural and urban coastal regions? Figure 3 does not seem to support the text sentence about relative lack of imagery in the Amazon basin or in Australia? High latitudes and Sahara/Sahel yes, but not Amazon or Australia? Why the apparent data hole over Afghanistan? Why the abrupt discontinuities at US-Canada, India-China and Brazil-Bolivia borders? Authors have avoided obvious features while discussing minor features in Australia or Indonesia?</p> <p>Need a systematic approach, to show careful (as opposed to apparently random) analysis by authors and to enhance utility to users. Start by latitude band? Then move to terrestrial biomes to replace ad hoc mention of e.g. 'temperate' or 'deserts' or 'northern high latitudes'.</p> <p>Because the narrative lacks organization and structure, a reader can't distinguish useful from non-useful. Abundant in one place relates to absence in another.</p> | <p>colors next to each other. Instead of red, we used a brown color. However, we will revisit this and attempt to improve the color schemes in the revised version.</p> <p>Thanks for these comments. We will take a more systematic approach to the way we describe the findings and improve the presentation in the revised version.</p> <p>We will pay more attention to the use of words, e.g. abundant vs absence so that these are not contradictory in the revised version.</p> |
| <p>Page 7 line 1: here we read about relative abundance of imagery for Australia whereas on Page 5 we read about a lack of imagery for Australia? Weakness in either the language or the analysis? All these 'conclusions' could change if authors presented data in an area-conservative map projection?</p> | <p>We will change the words to be consistent throughout the text.</p> <p>We used Robinson projection for visualization of the results. We will check if the conclusions will change if we use e.g. Goode homolosine projection, we will provide examples.</p> |
| <p>Page 8,9, Table 1: possibly useful, but here we find, for example, 70% and 100% coverage for Australia (Google vs Bing) and approximately 70% and 90% for the authors' category "Most of South America". Again this apparent mis-match between what a user reads in the text vs what the user finds in the maps or tables? Perhaps the authors need to define their terms for abundant or deficient?</p> | <p>This comment is related to those you raised above. We will use descriptive words more consistently throughout the text in the revised version.</p> |
| <p>Eastern Europe shows by far the worst coverage (but gets relatively little attention in the text?), presumably because by these definitions Eastern Europe includes high-latitude Siberia? We would learn more from a comparison of coverage by latitude, at least in the northern hemisphere, than from a coverage by geopolitical region?</p> | <p>We believe that most of the readers do their research by countries or by world regions rather than by latitude. Hence the practical value of this analysis is unclear for us. However, as mentioned in comments above, we will take a more systematic approach to the comparison in the revised version.</p> |
| <p>Page 10, Figure 4, here "parts of Eastern Europe" qualify as "areas with the most imagery available". Authors should adhere to a careful scale of most, many, abundant, few, etc. Too much confusion and apparent discretion.</p> | <p>As mentioned in the comments above, we will adjust the language to provide a better</p> |

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| <p>Apparently, researchers can access relatively abundant imagery for “some of the more populated regions across all the continents” but at the same time will find modest to low correlations of numbers of images with population in the least populated places with “no correlations in the rest of the world”. Authors have raised but not resolved a contradiction here: most VHR scenes available for populated areas but at the same time no correlation between scenes and population centres?</p> | <p>characterization of what we mean by terms such as most, many, abundant, etc. We will also revise our statements regarding the correlation with population centres.</p> |
| <p>Page 12, Table 2: Protected area relevance would make much more sense on an areal basis rather than the presence-absence approach given here? E.g. number of images that provide extensive coverage per area of protected region by geographic region? A large number of images concentrated in a relatively small protected area have less impact than a few images across a large area? If Eastern Europe or eastern US have relatively large numbers of images but relatively small areas of protection, those regions will distort or invalidate this analysis? Overall, with 3 or fewer images per protected area location, this entire topical discussion seems moot?</p> | <p>With this example, we want to show that VHR imagery could potentially be used for monitoring protected areas. A more detailed study on this topic (or one that focuses on specific protected areas) would be required and is a separate paper.</p> |
| <p>Page 13, deforestation: This sentence does not make sense: “There is good coverage by Bing Maps in the Amazon and the Congo basin but there is only one image available and the most recent, frequent year found is 4 to 6 years old.” One image constitutes “good coverage”? Due to this confusion, the following sentence about contrast results from Google also makes no sense.</p> | <p>We will rephrase this sentence in the revised manuscript.</p> |
| <p>Page 14, cropland: Again, this sentence makes little sense: “The results show that the cropland areas in these countries are covered by more than 90% VHR imagery in Google Earth; there are similar findings in Bing Maps except for Nigeria and Indonesia, which still have high coverage.” What means “high” relative to 90%? Very confusing!</p> | <p>We will amend the text to better explain this point.</p> |
| <p>Page 15, 16, Table 4: all countries except Mongolia have greater than 90% and 6 (Google) or 8 (Bing) have 100% coverage. Percentage differences come down to presence or absence of 1 image! Too much inference based on too little information content?</p> | <p>The aim of Table 4 is not to compare the percentages for these few countries. Rather the idea is to provide a quick overview of the availability of VHR imagery for anyone that is interested in monitoring cropland in these countries.</p> |
| <p>Pages 5, 17 and Table 5: comparison with urban areas. Authors have earlier pointed out the absence of correlation of image numbers with population but here users get a sense of positive correlation with urban areas. ?? Most researchers access current population data from CIESIN (Center for International Earth Science Information Network, Gridded Population of the World, Version 4 (GPWv4): https://doi.org/10.7927/H4PG1PPM). The so-called JRC layer as cited provides a gridded version of GPWv4 but in a spatial raster format less useful to many users.</p> | <p>The Reviewer has misunderstood the meaning of Table 5. It aims to answer the question regarding whether VHR imagery can be used for monitoring urban areas. As mentioned above, we will address the comment about the correlation with urban centres.</p> |

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| | <p>We can use the CIESIN data instead of the JRC layer to see if this changes the analysis.</p> |
| <p>Page 17 and 18: discussion. The points raised in discussion about the abundance of VHR imagery and the potential utility of that imagery seem valid, but in too many places apparently inconsistent with earlier text among the results. Examples -</p> <p>a) If the authors mention the northern parts of Columbia or Ecuador, or parts of Indonesia (which confusingly, shows an imagery deficit on page 5 line 16 but an imagery abundance on Page 10 line 3 and Page 14 line 9), then we should also get some discussion of Afghanistan?</p> <p>b) This combination of sentences and text does not make sense: “In the rest of the world there is some complementarity between Google Earth and Bing Maps, e.g. there are only Bing Maps present in parts of Canada, the Amazon, former Soviet Union countries and parts of Australia where Google Earth has no coverage. In contrast, Google Earth imagery adds very little additional spatial coverage ...” What “complementarity”?</p> <p>c) “the amount of historical imagery is actually quite small” (I agree!) but earlier we read (Page 7) that “North America, Southern Europe, Southern Africa, and Southern and Southeastern Asia have the richest archive of images”. “Rich archive” vs “quite small”? How does a user / reader know how to judge this information? Where should they look for useful imagery?</p> <p>d) “availability of VHR imagery in protected areas was surprisingly poor in North America, Eastern Europe and South America, particularly in Google Earth within the latter two regions” but Table 2 shows all regions except Eastern Europe above 50% image presence but in most cases only 3 images per area. Confusing?</p> | <p>We will address these inconsistencies (in particular those pointed out in comments a to d) as well as any others in the revised version of the manuscript.</p> |
| <p>The reference list seems very weak. It consists predominantly of reports, AGU abstracts, and self-promotional database or data portal documents. I count only 5 or 6 valid scientific publications using VHR imagery. The authors tend to defeat their case with this clearly-padded list.</p> | <p>All the references in which we are authors are relevant to the subject of this paper and hence are justified in being cited. There are not that many other references that use VHR imagery, which the Reviewer has also raised. Since the paper has been submitted, there have been a few more publications that have appeared; we will add these to references.</p> |