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**Earth System Science Data** Discussions

# *Interactive comment on* "A dataset of 30-meter annual vegetation phenology indicators (1985–2015) in urban areas of the conterminous United States" *by* Xuecao Li et al.

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MS No. essd-2019-9A: dataset of 30-meter annual vegetation phenology indicators (1985-2015) in urban areas of the conterminous United States

Below is my review for the above manuscript. Overall I found it novel and a contribution to future research on the ecology of urban and peri-urban ecosystems in the United States. I have included some grammar and context suggestions as well as other suggestions. Key among these is that this data set can have many more applications that the ones currently presented in the manuscript. I have included some of these suggestions.

In terms of data quality, I did view some scenes directly on the Figshare site and did notice some problems with the overall visual quality of the scenes as many were distorted and banded. I also downloaded and opened in ArcCatalog and Arcmap some of the raster datasets. I did have a difficult time in trying to determine the overall content and geographic location of many of the images. The SHP file did help but a summary and description of each raster data set might have been helpful. However, I did not open every single raster data set or overlay some of these onto other geospatial data to assess their quality.

Below are some comments regarding the manuscript which I hope you will find useful.

Abstract Page (P) 2, Line (L) 10 and P3, L2: I would think that currently "fine-resolution" refers to submeter imagery. Landsat may have been fine in the 1980-90s but now it is considered medium resolution I would think.

P2, L 10-14: Atmospheric, soil and light pollution in urban environments will also drive plant phenology (e.g., leaf deciduousness-senescence), such a dataset can have applications to address issues like these.

P2, L 15: Urban morphology might be more relevant than "development"

P3, L5, "There have been" few attempts... Also specify what you mean here by "large scale". I believe you mean something like "regional (as opposed to local) scale".

P3, L13, "...therefore lack large-scale..."

P3 L14, "...urban ecosystem are more complex..." Mention something about the high floral species richness found in cities, relative to rural area in these latitudes.

P4, L9: Perhaps say urban areas instead of cities.

P4L 10: You did not use Landsat for the NTL observation I imagine? P4 L 18-19: Specify all the correction procedures (e.g., cloud removal) used.

P6 L 1-5: As mentioned in the introduction, urban area are heterogeneous and com-

plex, not only in terms of vegetation diversity and phenology, but land use/covers as well. How was this accounted for in your methods? That is "vegetation" and "urban areas" are not homogenous in terms of their spectral and environmental characteristics. Land cover change is mentioned in Line 5 but did you develop a new, or use an existing urban land cover classification?

P8 L 24-25: Was the fact that these appear exclusively to be deciduous forest types a coincidence? Specifically, how do evergreen forest types/trees affect the urban phenology results?

P10 L10-11: Can increased impervious surfaces, pollution or changing species composition over the analysis period, also be a correlate?

Conclusion: the first 2 paragraph are repetitive. Perhaps discuss some limitations and more applications e.g., many vegetation-air pollution deposition models need leaf on/off data, city-level urban tree cover classification need to be done during leaf on, etc.

Figure 1-11 A1. Please spell out all acronyms. The reader should not have to read the text to find what the acronyms and symbols are.

Data quality from: https://doi.org/10.6084/m9.figshare.7685645.v2 I viewed thumbnails of all the *.tif files but did not attempt to download all since I am having trouble with memory and the ArcGis license. I did download and view several files and viewed them in the figshare site. Some of these scenes in the figsahre.com site (e.g., US_uCluster_83_COR-1985-2015.tif) seemed to have distortion in the form of a distorted scene, specifically 1/3 of the image was banded and distorted. I did view several other raster data sets in ArcCatalog (e.g. The uCluster_USA_gt500) and a summary and descriptions in the "Description" or metadata of the Raster dataset would have been helpful in understanding the content data set. The uCluster_USA_gt500. However I am unable to fully assess data quality at this time.

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