

Review of snow phenology variation

By Hui Guo et al.

Even if it is a “Review article”, it must make a significant contribution to the field, especially in a specialized journal like TC. This is not the case with this article. There is no structured, any classified synthesis and a lot of verbose!

The parameters used to describe snow (phenology: beginning, end and duration of snow cover) have a great spatial variability, and for each major region (North America (NA), Eurasia, Arctic) a specific evolution.

As the authors know, snow is the result of 2 phenomena: temperature and solid precipitations, 2 independent mechanisms (phenomena) evolving differently that are sometimes also interconnected but not always (it rains in winter!). It is well known, but here, it goes in all directions, with lists of cases referenced. Typically in Fig. 4, there are (more or less) in each box of the flowchart : so what? In Fig.3, precipitations: liquid or solid?

Section 2: good Tables 1 and 2. But for the sections 2.1.3 and 2.1.4, recent references are missing (e.g. Mudryk et al.).

Section 3 should be presented as an example of the spatial variation of snow phenology averaged over 50 years (1970-2020) (Fig.1) and its temporal variation averaged over the whole Northern Hemisphere (NH) (Fig.2). OK, but so what?

In Fig.1, we can see the averaged latitudinal and altitudinal distribution. In the temporal variation (Fig.2), you have cut the trends in several sections, but over not significant periods! Moreover, when we know that the trend in NA is the opposite of that in Eurasia, what sense can be given to the global trend? Nevertheless, this figure is still interesting (with the global trend line over the whole period) and presents a global synthesis of the situation.

Sections 4 remains in generalities, without synthesis. The Fig.3 is simplistic and explains nothing.

The links with the vegetation are poorly explained. At the scale analyzed we talk about large biome, forest/non forest? This section is weak.

Section 5 Prospects: I do not agree that it has inconsistency on the detection methods of phenology, the simplest parameters to measure (done since 1966!). This may be true for other parameters such as depth, density or Snow Water Equivalent, but not for the onset, end and duration of snow cover. Depending of the scale of the analysis, the spatial resolution could be an issue. OK.

I don't understand the “human activity”, you mean global warming generated by human activity?

In conclusion I do not recommend the publication of this article in TC. Perhaps, if restructured, publishable in a more generalist journal