

When to Employ Packing Attributes

Recommendation:

We recommend that packing attributes (i.e., `scale_factor` and `add_offset`) be employed only when data are packed as integers.

Recommendation Details: Packing refers to a lossy means of data compression that typically works by converting floating point data to an integer representation that requires fewer bytes for storage. The packing attributes `scale_factor` and `add_offset` are the netCDF (and CF) standard names for the parameters of the packing and unpacking algorithms. If `scale_factor` is 1.0 and `add_offset` is 0.0, the packed value and the unpacked value are identical, although their datatype (float or integer) may differ. Unfortunately, many datasets annotate floating point variables with the attributes, apparently for completeness, even though the variables have not been packed and remain as floating point values. Incorporating packing attributes on data that have not been packed is a misuse of the packing standard and it should be avoided. Data analysis software that encounters packing attributes on data that are not packed is liable to be confused and perform in unexpected ways. Packed data must be represented as integers, and only integer types should have packing attributes.