

# Documentation for CROCUS debugging

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## 1 Print daily informations

To print daily informations, you must define the environment variable CROCUS\_INFO before running OFFLINE :

```
export CROCUS_INFO=1
```

This will print the number of snow layers for a given point (see section 3), the snow fraction for the same point, and the number of points with snow on the ground.

## 2 Print detailed snow profiles at each time step

To print detailed informations necessary for debugging, you must define the CROCUS\_DEBUG environment variable before running OFFLINE :

- export CROCUS\_DEBUG=1 to print a vertical profile at the beginning and at the end of each time step
- export CROCUS\_DEBUG=2 to print a vertical profile after each CROCUS subroutine
- export CROCUS\_DEBUG=3 same behaviour as CROCUS\_DEBUG=1 + print meteorological forcing data
- export CROCUS\_DEBUG=4 same behaviour as CROCUS\_DEBUG=2 + print meteorological forcing data
- export CROCUS\_DEBUG=5 to print a very detailed vertical profile (including variables GRAN1, GRAN2, HIST, AGE) after each CROCUS subroutine

## 3 Choose the output point for multi-points simulations

If CROCUS\_INFO and/or CROCUS\_DEBUG are defined, you may optionally define other variables to choose the point which will be printed :

- export CROCUS\_DEBUG\_POINT=X to choose a point by its indice inside CROCUS routine. Be careful, if some areas are snow-free, the point number can vary from a time step to another.
- export CROCUS\_DEBUG\_LAT=X
- export CROCUS\_DEBUG\_LON=X to always print the same geographical point, defined by latitude and longitude. (recommanded)

If there is no spatial information (these variables are not defined), profiles are printed for the first simulation point.

## 4 Choose the dates for printing

To activate the debugging mode after a given date :

export CROCUS\_DEBUG\_DATE=YYYYMMJJ (recommanded if the bug does not occur in the first simulation days).

To specify the hour for activating the debugging mode :

export CROCUS\_DEBUG\_HOUR=HH

To stop the debugging mode after a given date :

export CROCUS\_DEBUG\_DATE\_END=YYYYMMJJ

If there is no temporal information, profiles are printed from the first time step to the end of the run (or the crash). Be careful to not activate CROCUS\_DEBUG for long simulations without temporal limitations to avoid huge outputs.