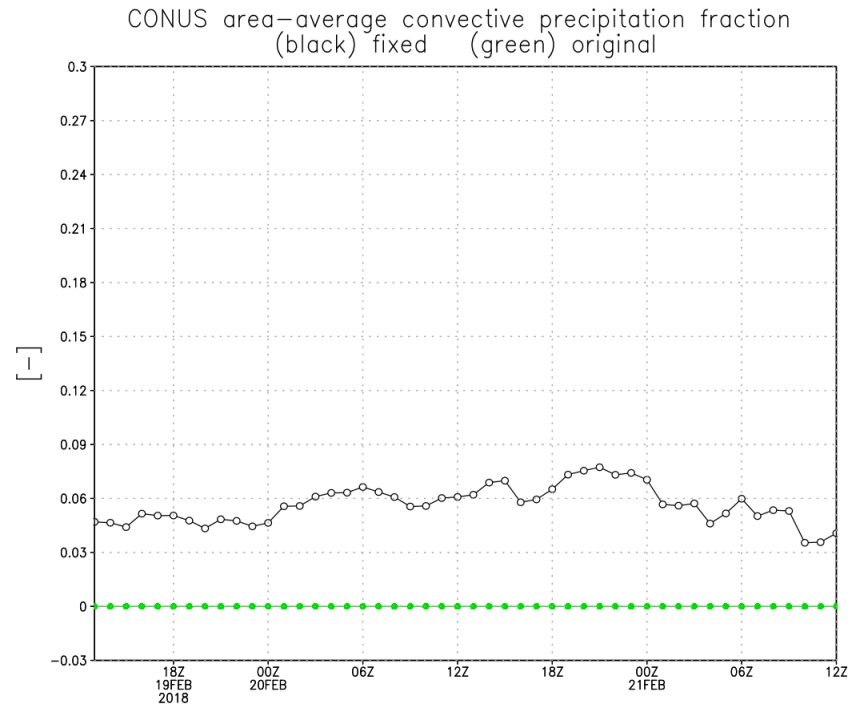
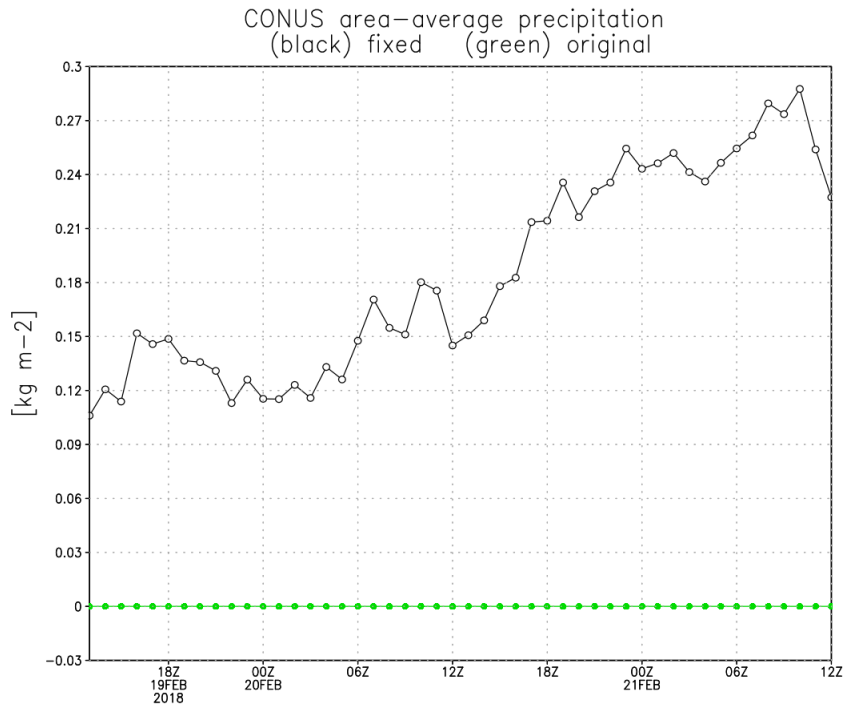


# NLDAS-2 fixed forcing summary

- Forcing “A” files – hourly for 13Z 19 Feb 2018 to 12Z 21 Feb 2018:
  - Total precipitation field was fixed over CONUS/Mexico (apcpsfc)
  - Convective precipitation fraction field was also fixed (convfracscf)
  - Slight changes in Canada along the U.S. border due to blending (apcpsfc/convfracscf)
  - Surface pressure has a extremely small insignificant increase over the original forcing, related to machine-precision (pressfc)
  - All other fields are the same as before
- Forcing “A” files – monthly-average for Feb 2018:
  - Total precipitation amount was fixed over CONUS/Mexico (apcpsfc)
  - Convective precipitation amount was also fixed (convfracscf)
  - Same comments as above about slight changes to precipitation in Canada and to a very small increase in surface pressure
  - All other fields are the same as before

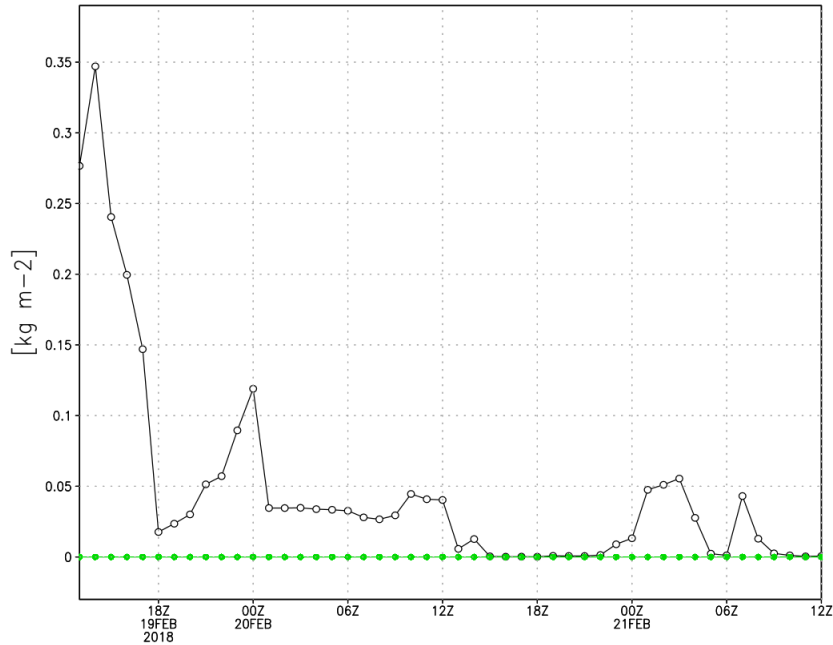
# CONUS precipitation time series



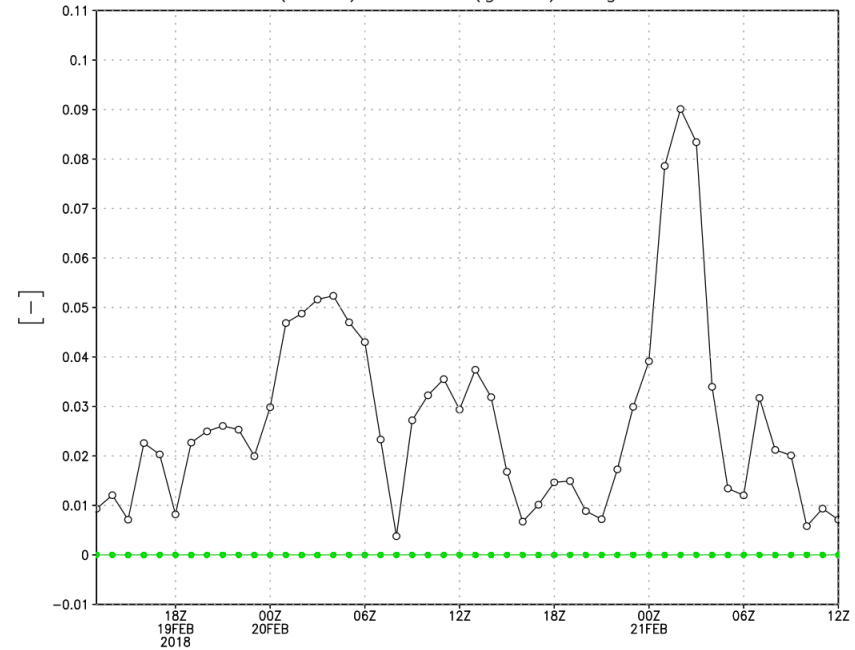
- Area-average time series of hourly precipitation over CONUS revealed a two-day period with no precipitation in the original NLDAS-2.
- From 13Z 19Feb2018 to 12Z 21Feb2018, original NLDAS-2 has no precipitation within CONUS.
- Fixed precipitation looks reasonable over CONUS.
- Convective precipitation fraction (right panel) also is reasonable, no longer at zero.

# Mexico precipitation time series

Mexico area-average precipitation  
(black) fixed (green) original

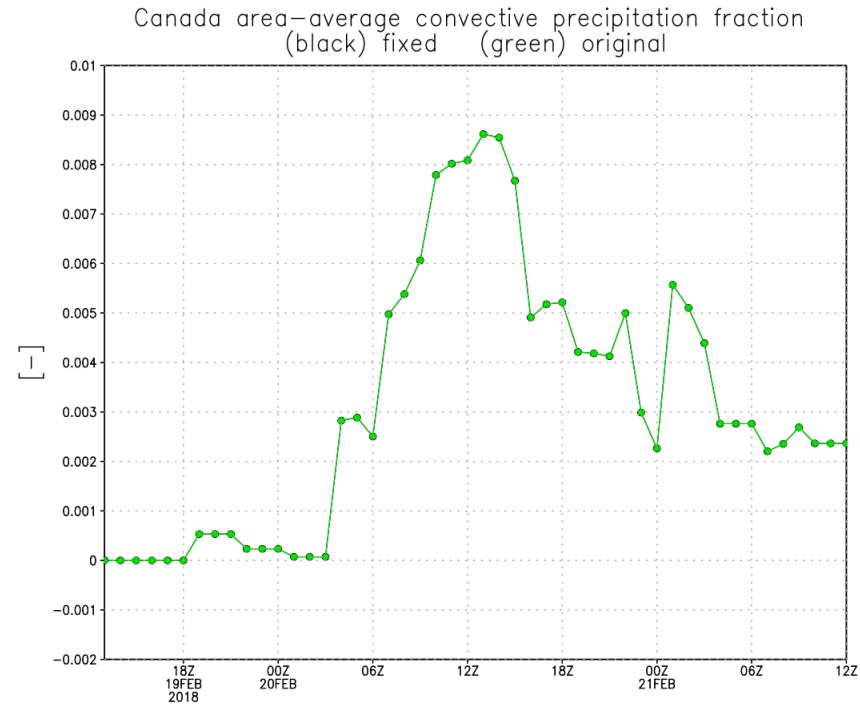
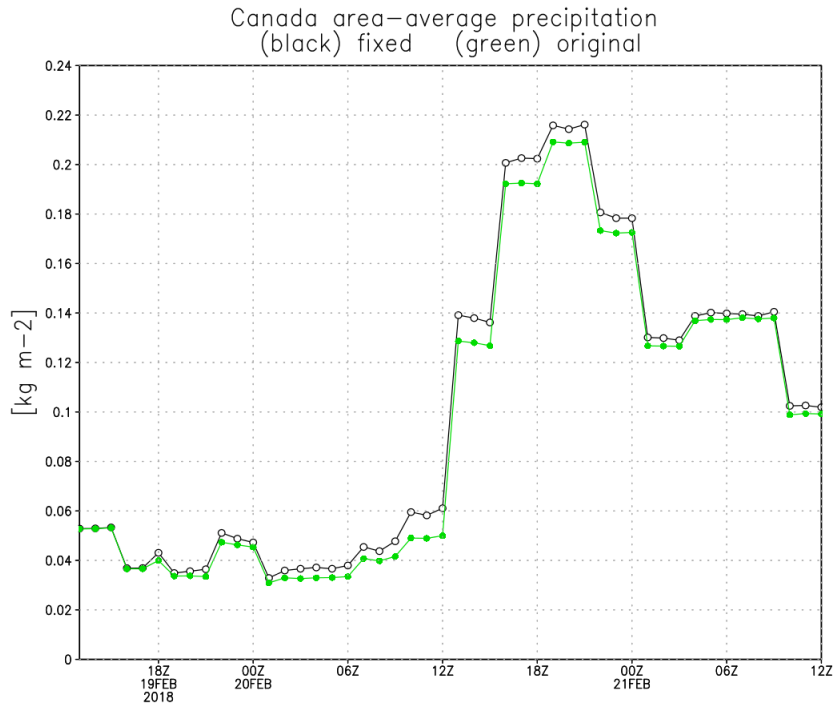


Mexico area-average convective precipitation fraction  
(black) fixed (green) original



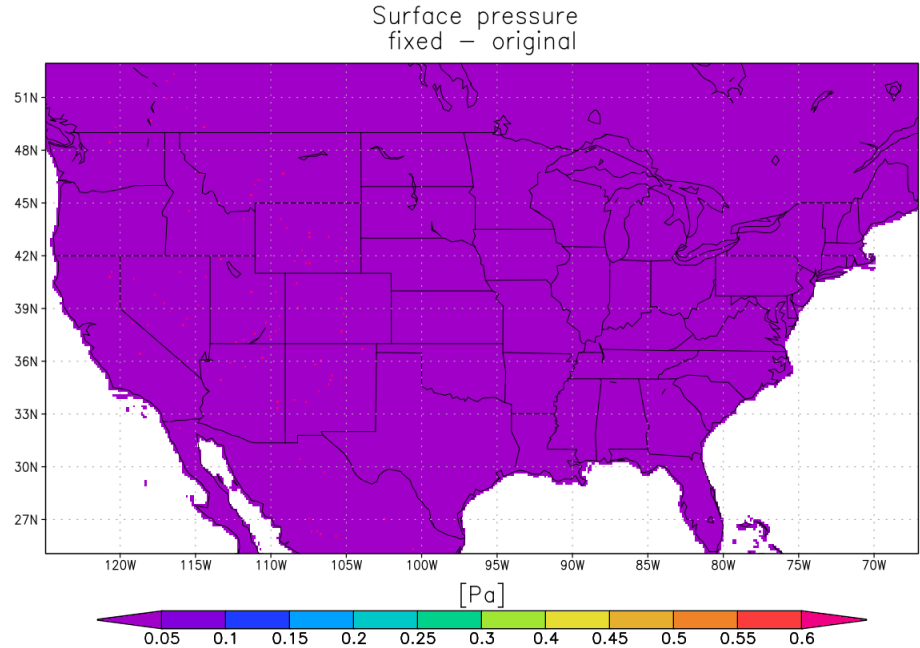
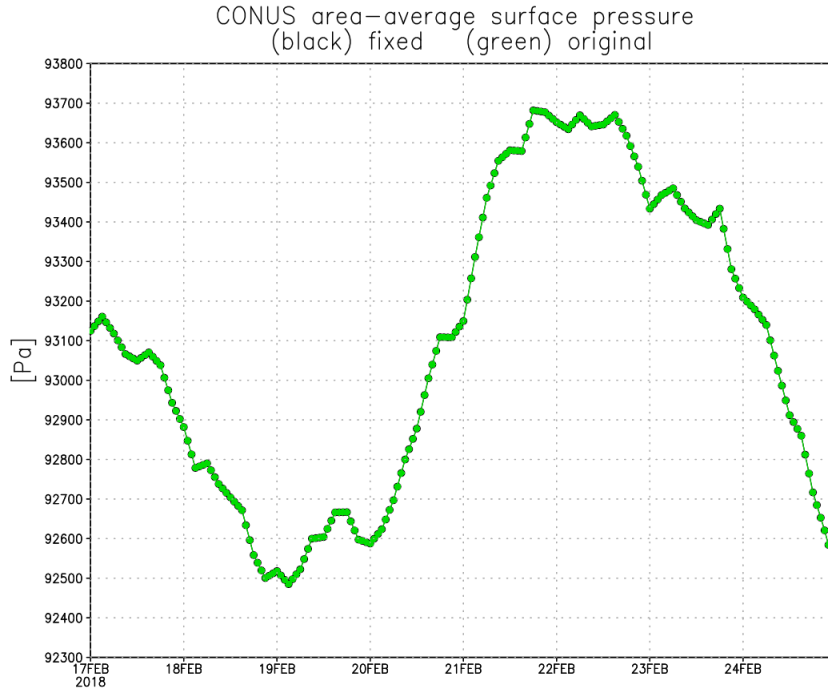
- From 13Z 19Feb2018 to 12Z 21Feb2018, original NLDAS-2 has no precipitation within Mexico.
- Fixed precipitation looks reasonable over Mexico.
- Convective precipitation fraction (right panel) also is corrected.

# Canada precipitation time series



- From 13Z 19Feb2018 to 12Z 21Feb2018, original NLDAS-2 has slightly reduced precipitation within Canada.
- Difference is likely due to smoothing of CONUS precipitation across the CONUS-Canada border.
- Convective precipitation fraction (right panel) shows essentially no differences during this period.

# Very small surface pressure difference



- During this period, there is a very small increase in the area-averaged surface pressure over CONUS.
- The black line is under the green line in the left panel; area-averaged differences are on the order of 0.0007 Pa.
- Seems related to speckling isolated points (example on right panel); the point locations vary from time-step to time-step.
- These points can be anywhere in the domain (CONUS, Canada, Mexico).

# NLDAS-2 precipitation issue

The NLDAS team is working to keep this from happening again.

- The previous operational scripting only checked to see if the CPC daily gauge analysis files were available operationally or not. If not, then the NARR model precipitation is used as a replacement. However, the script did not check if the files were available, but the values all undefined/zero.
- The script was updated to check that there are realistic values from this field. It appears to be the first time this occurred in the ~10 years of quasi- or NCO operational production of NLDAS-2 precipitation.
- **As of right now, the operational NLDAS-2 LSMs were forced with the zero precipitation over CONUS/Mexico for those two days in February. Thus, especially in the central U.S., the soil moisture will be drier than the actual conditions, until the system recovers. We are exploring the possibility of a re-run from mid-February to correct all NLDAS-2 LSMs.**