**Component name(s):** Bias correction and metrics scripts for FAME

**Contributing organization/individuals:** University of California, Santa Barbara (UCSB)

**POC:** Dr. Shraddhanand Shukla; UCSB

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**License:** No explicit license attached.

**Reference:** The code is based on the bias-correction and downscaling method described in Wood et al., 2002

Wood, A. W., Maurer, E. P., Kumar, A., and Lettenmaier, D., Long-range experimental hydrologic forecasting for the eastern United States, J. Geophys. Res., 107( D20), 4429, doi:10.1029/2001JD000659, 2002.

**Disclaimer:** The code is developed to facilitate research applications, and operational applications such as to support decisions, would be at user's own risks.

**Relevant email communication:**

From: Shraddhanand Shukla <sshukla@ucsb.edu>

Date: Monday, September 27, 2021 at 16:00

Hi Jim,

Thanks and yes, please redistribute those scripts too. Thanks

Best regards,

Shrad

On Mon, Sep 27, 2021 at 11:58 AM Geiger, James V. (GSFC-5870) <james.v.geiger@nasa.gov> wrote:

Hello,

Your changes are good. Thank you very much.

We forgot to include these scripts in our original request:

Collect\_time\_series\_Dyn\_FCST.py

Collect\_time\_series\_ESP\_FCST.py

Collect\_time\_series\_OL.py

Convert\_Dyn\_FCST\_to\_PCTL.py

Convert\_lead\_0\_monthly\_Final\_OL\_output\_to\_PCTL.py

Convert\_lead\_0\_monthly\_Prelim\_OL\_output\_to\_PCTL.py

Convert\_OL\_output\_to\_PCTL.py

Copy\_Convert\_Dyn\_FCST\_to\_PCTL.py

Plot\_Historical\_Multimodel\_OL\_vs\_Dynamical\_Hydrologic\_fcst\_Pctl.py

Plot\_Multimodel\_OL\_Pctl.py

Plot\_Obs\_vs\_Dynamical\_fcst\_precip\_Pctl.py

Plot\_real-time\_FAME\_FCST\_FirstLook\_PCTL.py

Plot\_real-time\_FAME\_FCST\_FirstLook\_vs\_LateLook\_PCTL.py

Plot\_real-time\_forecast\_tercile\_probability.py

Plot\_real-time\_INPUT\_FAME\_RT\_FCST\_PCTL.py

Plot\_real-time\_OUTPUT\_FAME\_RT\_FCST\_PCTL.py

May we also redistribute these metrics scripts as part of the Land Information System Framework?

Thanks,

Jim

From: Shraddhanand Shukla <sshukla@ucsb.edu>

Date: Monday, September 27, 2021 at 12:58

Hi Jim and Kristi,

My apologies for a delayed response on this. I have made small changes in the attached document, please take a look and let me know what you think. Please free to suggest changes. Thanks very much!

Best regards,

Shrad

From: "Geiger, James V. (GSFC-5870)" <james.v.geiger@nasa.gov>

Date: Thursday, September 2, 2021 at 10:02

Hello,

Thank you very much.

For code like this, I add any disclaimers provided to me to the appropriate license document - see attached draft. This document is keep with the LISF source code in lis/LICENSES/. LISF, itself, is released under the Apache 2.0 license.

Thanks,

Jim

From: Shraddhanand Shukla <sshukla@ucsb.edu>

Date: Thursday, September 2, 2021 at 01:38

Hi Jim,

Thank you for checking in. I have no issue with sharing of these scripts, I just wish that they could be updated to better utilize newer python packages. Also I assume any public sharing of the scripts comes with a disclaimer (e.g. use them at your own risks)?

Thanks,

Best regards,

Shrad

On Wed, Sep 1, 2021 at 11:32 AM Geiger, James V. (GSFC-5870) <james.v.geiger@nasa.gov> wrote:

Hello,

We would like to redistribute your bias correction code developed for the Forecasting for Africa and the Middle East (FAME) project, under NASA's Earth Science Applied Sciences -- Water Resources Application Area and Program, grant number NNX15AL46G, as part of the Land Information System Framework (https://lis.gsfc.nasa.gov/). In particular, we want to redistribute these files:

Bias\_correction\_modulefast.py

Bias\_correction\_NMME\_modulefast.py

Calc\_and\_Write\_forecast\_climatology.py

Calc\_and\_Write\_NMME\_forecast\_climatology.py

Calc\_and\_Write\_observational\_climatology.py

Combine\_Sub\_Daily\_downscaled\_forcings.py

Daily\_Temporal\_disaggregation\_module.py

Shrad\_modules.py

Sub\_Daily\_Temporal\_disaggregation\_module.py

These files do contain an explicit license like BSD/MIT or Apache 2.0, so I need your permission as the institutional PI on this project or the permission from someone with the appropriate authority to redistribute them.

May we redistribute these bias corrections scripts as part of the Land Information System Framework?

Thanks,

Jim