RESPONSE TO THE EDITOR

On 18 January, 2024, Topic editor Dr. Lee provided us with the following directions for revision:

"The authors seem making their best efforts to improve the quality of the manuscript following the comments from two reviewers. The improvement must be judged by two reviewers again to justify the responses from the authors. Therefore, this TE suggests reconsidering after major revisions."

Our response: We appreciate the TE's positive assessment. We wish to point out that we have received a re-review of the earlier revised manuscript only from ONE reviewer (Reviewer#1). In the above, the TE mentions 'two' reviewers. We have searched hard and we could not find the re-review by Reviewer#2 Dr. Jim Nelson. We would also like to note that Reviewer#1 (Report#1) mentions in their decision ***"For final publication, the manuscript should be accepted as is".***

Reviewer#1 has provided only one comment according to which we have formulated our revision and provided our response to that comment (see below).

The key additional work we have undertaken to address the reviewer#1's concerns are as follows:

- We have improved the quality of figures.
- We have elaborated the captions for the Tables.
- We have made formatting changes to improve presentation.

In the section below, our response to the reviewer#1 comment is shown in blue while the reviewer's comments are in black.

SPECIFIC RESPONSES TO REVIEWER#1 (Report#1)

Comment One: "*For final publication, the **manuscript should be accepted as is.**"*

Our response: Thank you for your endorsement of our paper and our revision efforts earlier.

Comment Two: *"The paper effectively highlights the key technological advancements in RAT 3.0 that make it more accessible to wider community of users and researchers for reservoir studies. I appreciate the authors' prompt response and **am pleased to accept the manuscript**. A gentle reminder: please address the formatting issues and specific details (e.g., line 408, Table caption, Figure quality), as they impact the overall quality of the paper."*

Our Response: Thank you for the comment and bringing our attention to the formatting issues in the manuscript. We have made formatting changes wherever required to maintain the uniform and consistent formatting throughout the manuscript. Also, figures with less than 300 dpi have been replaced with higher quality figures (figure number 11 and 14) as follows:

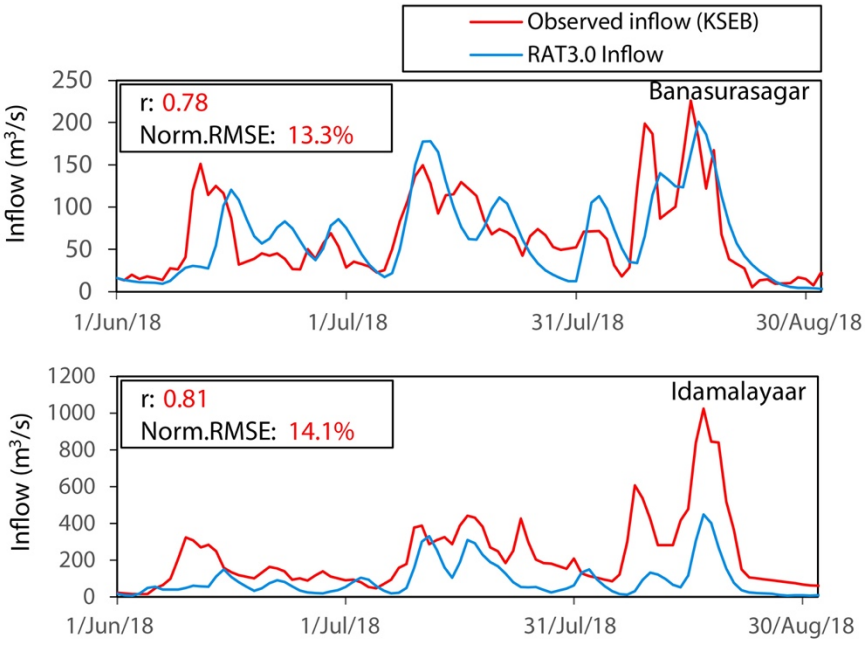
Observed inflow (KSEB)
RAT3.0 Inflow
Banasurasagar
r: 0.78
Norm.RMSE: 13.3%
Inflow (m³/s)
250
200
150
100
50
0
1/Jun/18
1/Jul/18
31/Jul/18
30/Aug/18
Idamalayaar
r: 0.81
Norm.RMSE: 14.1%
Inflow (m³/s)
1200
1000
800
600
400
200
0
1/Jun/18
1/Jul/18
31/Jul/18
30/Aug/18

Figure 11

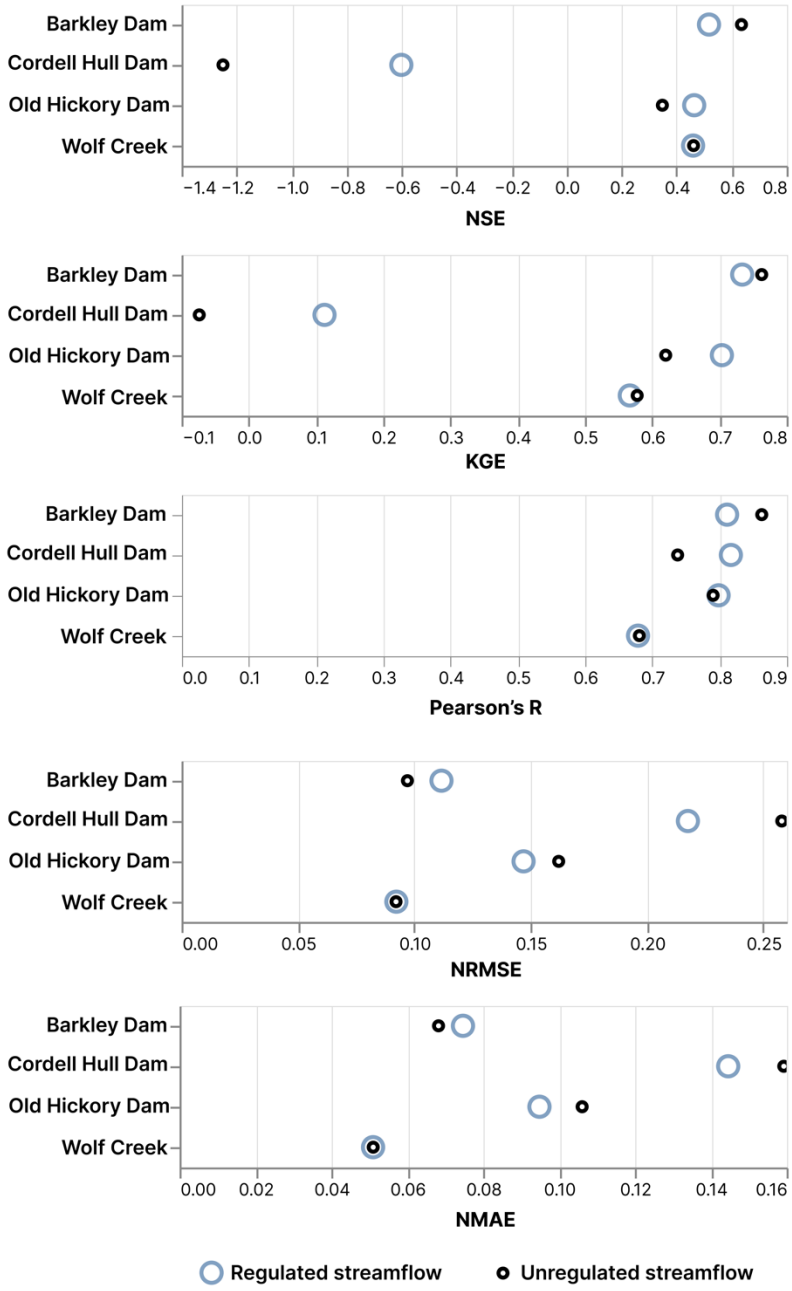

Figure 14

We have also edited the Table captions (Table 1,2 and 3) to elaborate the information about the data it contains.

Step Number	Step Name
1	Downloading and Pre-processing of meteorological data
2	Pre-processing of data and preparation of MetSim Input
3	Preparation of MetSim Parameter Files
4	Running MetSim & preparation of VIC input

5	Preparation of VIC Parameter Files
6	Running of VIC and preparation of Routing input
7	Preparation of Routing Parameter Files
8	Running Routing
9	Preparation of parameter files for Surface Area Calculation
10	TMS-OS Surface Area Calculation from GEE
11	Elevation extraction from Altimeter
12	Generating Area Elevation Curves for reservoirs
13	Calculation of Outflow, Evaporation, Storage change and Inflow
14	Conversion of output data to final format as time series

Table 1: List of the 14 steps along with their functions which can be executed by running RAT 3.0.

Aspect		**RAT 2.0**	**RAT 3.0**
SCALABLE	a)	Limited to Mekong River basin and its dams	Generalized for any reservoir worldwide
	b)	High number of manual input requirements	Automatic input generation reduces number of inputs required from user
	c)	Manual work required to use assets in Google Earth Engine and create inputs	Does not use Google Earth Engine assets; automatic creation of inputs at the time of execution
ROBUST	a)	Does not handle missing meteorological data	Improved handling of missing data with automatic interpolation
	b)	Limited error handling; Difficult to debug with one log file	Enhanced error and exception handling; Easy to debug with 2 log files
	c)	Failure in one component disrupts entire execution	Modular architecture allows independent execution
USER- FRIENDLY	a)	Disorganized output files	Intuitive directory structure for organized outputs
	b)	All inputs were not provided through a configuration file	Single configuration file handles all inputs
	c)	Lack of operationalization feature	Built-in feature for operationalization that works with cron job

EFFICIENCY	a)	No hot-start feature, less efficient use of resources	Hot-start feature for efficient resumption of execution
	b)	Limited use of parallel processing within RAT Framework	Parallelization with Dask library for resource efficiency in RAT Framework
	c)	Accumulation of output files, inefficient memory use	User-selectable automatic deletion of intermediate output files

Table 2: Comparison of enhancements in RAT 3.0 as compared to RAT 2.0 in terms of scalability, robustness, user-friendliness and efficiency.

S. No.	Dataset Name	Brief Description	Additional Information	Reference
1	GRDC Major River Basins	Shapefile of all the major river basins' polygons in the world.	Version - 2nd Revised Edition, 2020; Src- The Global Runoff Data Centre	GRDC, 2020
2	GRanD Dams	Shapefile of all the major dams' locations in the world.	Version - 1.3 ; Src - https://www.globaldamwatch.org	Lehner et al., 2011
3	GRanD Reservoirs	Shapefile of all the reservoirs' polygons associated with dams in [2].	Version - 1.3 ; Src - https://www.globaldamwatch.org	Lehner et al., 2011
4	DRT Flow Direction	Global raster file providing the flow directions in WGS84 projection.	Resolution - 1/16º; Src- Numerical Terradynamic Simulation Group , University of Montana	Wu et al., 2011, 2012
5	SRTM_30 Elevation	Global elevation raster file providing elevation in meters.	Resolution – 30 arc seconds ; Src - Scripps Institution Of Oceanography, University of California San Diego	Becker et al., 2009
6	VIC Soil Parameters	Global VIC soil parameter dataset containing separate raster files for each continent in WGS84 projection.	Resolution - 1/16º; Spatial coverage from 60°S to 85°N; Version-1.6d ;Src- DOI 10.5281/zenodo.3475601	Schaperow et al., 2021
7	VIC Domain Parameters	Global VIC domain parameter dataset containing separate raster files for each continent in WGS84 projection.	Resolution - 1/16º; Spatial coverage from 60°S to 85°N; Version-1.6d ;Src- DOI 10.5281/zenodo.3475601	Schaperow et al., 2021
8	EGM2008	Geoid model that provides mean sea level in meters everywhere on Earth.	Resolution – 5 arc minutes; Src- National Geospatial-Intelligence Agency (NGA)	Pavlis et al., 2012

Table 3: Different datasets along with their description and source, that are included in the global database and are used as default inputs by RAT 3.0 if downloaded by the user.

We have provided a Track change manuscript for the reviewer and TE to verify that we have made all those changes to improve the quality of the manuscript.

SPECIFIC RESPONSES TO REVIEWER#2 (Dr. Jim Nelson)

Reviewer#2 had no review of the revised manuscript. His earlier decision based on his review submitted on Nov 11 2023 was ***"accepted subject to minor revisions."***

Our response: NONE (because there is no Report#2 to go by). However we sincerely appreciate Dr. Nelson's clear endorsement of our work to develop a globally scalable reservoir tracking tool that lowers the barrier of entry for the community to replicate and reproduce independently for their own geo-scientific model development.