OPEN-SOURCE APPROVAL TRACKING

Form 1: Initial/Major Release

Software Name

Self organizing maps (SOM) for stochastic hydrograph typing

Software Description

Hosting Location: Reclamation Github account mirrored to the internal Gitlab account

The project developed an automated hydrograph classification workflow using a two-stage classification procedure, first a self-organizing map machine learning (ML) method followed by mean shift clustering. The SOM method groups hydrographs by evaluating their similarity in the shape and magnitude. The SOM groups are further refined with the mean shift clustering operation to yield a small number of hydrograph clusters that are representative of the range of behavior at a site. The developed ML workflow is an automated process with minimal user input that runs rapidly and scales to the number of hydrographs produced by stochastic rainfall/runoff models. The ML hydrograph classification workflow was tested across multiple gage and model instances. In each of these cases, the ML workflow was robust and produced a hydrograph classification that is representative of the site.

Reclamation Developers

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Justification for Open Sourcing

Reclamation received a request from a USACE contractor to release the SOM code to support ongoing USACE programs. Per Federal guidance releasing all Federal, internally developed source code into the public domain, Reclamation initiated internal review to support the request.

Reviews

Scientific

Name: Signature:

DREW LONEY

Digitally signed by DREW LONEY
Date: 2023.05.08 20:37:03 -06'00'

Security

Name: Signature:

LINDSAY BEARUP

Digitally signed by LINDSAY BEARUP
Date: 2023.05.09 09:36:58 -06'00'

Management

Group Manager Name: Signature:

IAN FERGUSON

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Date: 2023.05.09 20:06:48 -06'00'

Division Manager Name: Signature:

KURT WILLE

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Date: 2023.05.11 06:18:51 -06'00'

Regional Office

Approving Official Name: Signature: