## horizontal line

# **Global SSEBop ET update February 2019**

In the current process of creating SSEBop ET Version 5, following improvements have been made to the model:

* Updated all input data sets to the latest versions
* Improved the dT parameter by using a updated incoming solar radiation equation Rs, including an adjustment coefficient kRs ~ 0.16.
* Created a new extraterrestrial radiation data set based on a 1km latitude grid instead of 10km. This will make sure all small islands, such as Hawaii or the Florida Keys are included.

The ETf calculation is the same, including the following steps:

- Cap dT raster between 6 and 25 K

- Create Tcold with Tmax \* c factor

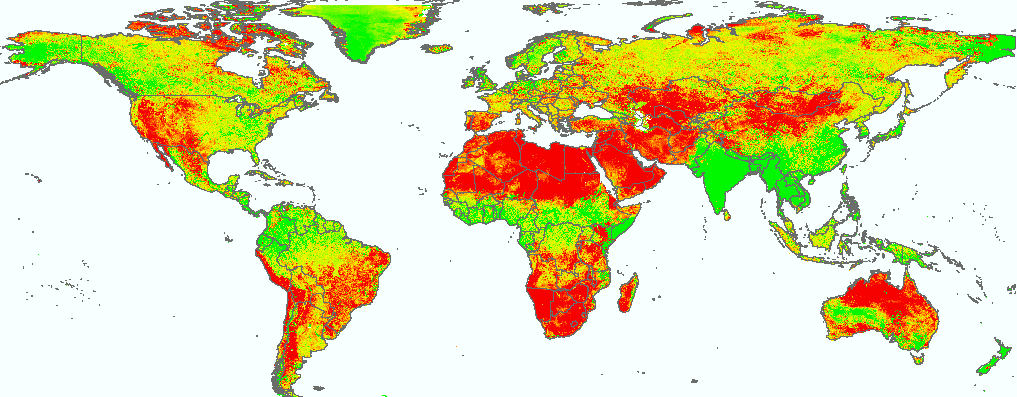
- Create Thot with Tcold + limited dT raster

- Albedo corrected LSTa

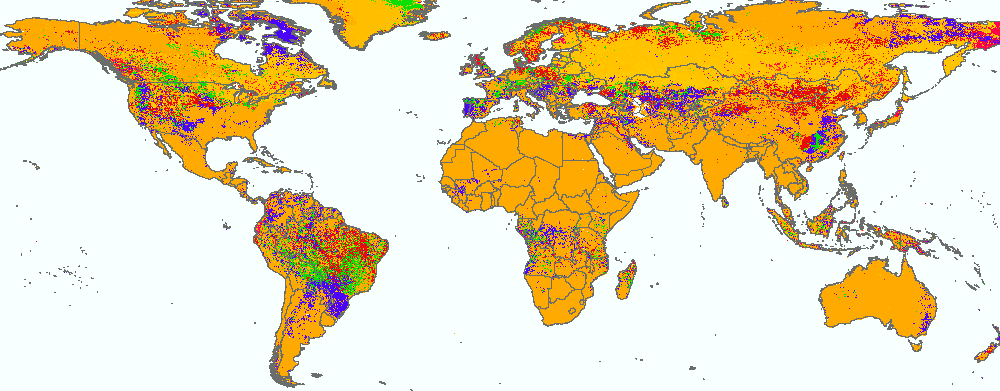
- Emissivity corrected LSTe

- Calculate ETf = (Thot – LSTe) / limited dT raster

After the ETf data set is created, the PAPA algorithm is applied to high values above 1.3. High values are present in areas where the difference between Thot – LSTe is significantly higher than the dT. Reasons here fore include cloud contamination and input data error.



This step includes a new QA raster providing information about what pixels where “good” (orange) and which ones got replaced with what value.



Currently we are processing the actual ET for every year. This is an example of a preliminary annual ET grid for 2016.

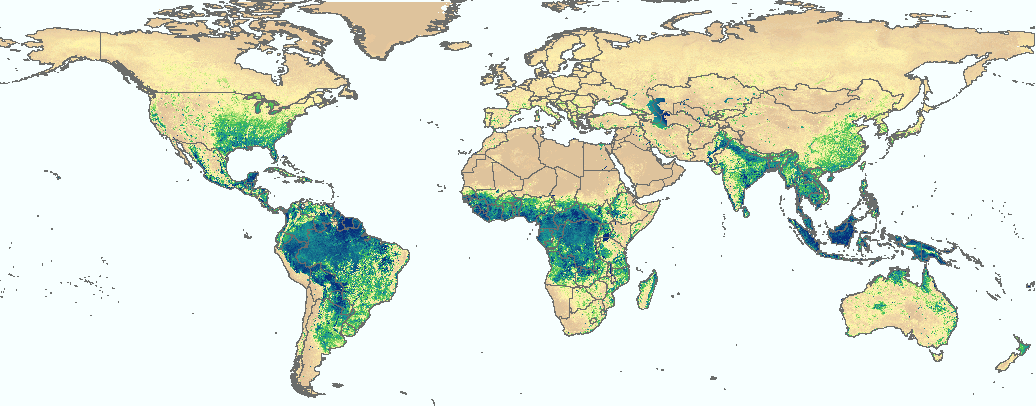
We used following math to arrive at this ETa:

ETax = corrected ETf \* reference ET same as in Version 4)

Conditions applied:

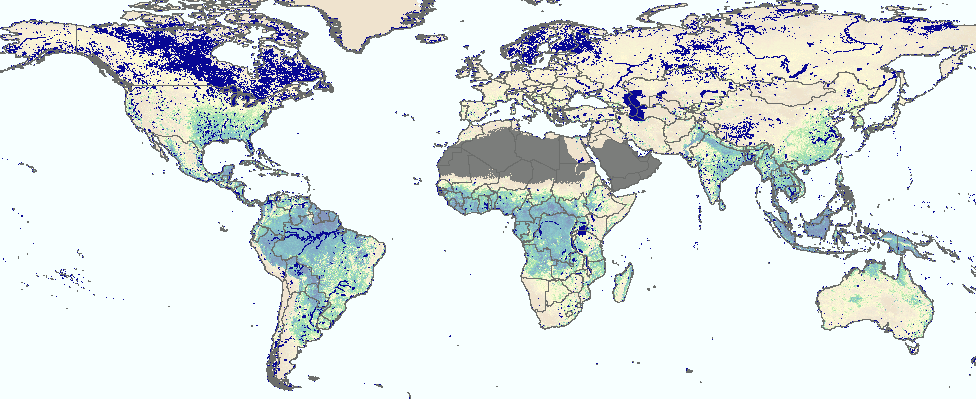
ETax \* kgrid → for preliminary results we use a k value of 1.0

Desert mask and water mask are applied to adjust those features. 32% of ETax in desert areas and 85% of ETax for water.





Map of desert (grey) and water (blue) areas adjusted



Next steps are evaluating preliminary data and determine final parameters such as the k value(s).