|  |  |  |  |
| --- | --- | --- | --- |
| Table 3. Inputs and calculation steps for the SEBAL model (Bastiaanssen et al, 1998). | | | |
|  |  | |  |
| **Inputs** | **Description** | | **Data Sourcea** |
|  | Instantaneous net radiation | | Eq 1 |
|  | 24-hour mean net radiation | | Eq 1 |
| 1. NDVI | Normalized Difference Vegetation Index | | Imagery |
|  | Radiometric Land Surface Temperature (K) | | Imagery |
| 1. U | Wind Speed (m/s) | | Wind Speed from meteorological station or gridded data |
|  | Surface Roughness (dimensionless) | | Land use map, literature values |
| 1. Elevation | Surface Elevation(m) | | Digital Elevation Model (DEM) |
|  | | | |
| **Derived variables** | **Description** | | **Equation** |
| 1. G | Ground heat flux (W/m2) | | G = Rn\*(TR-273.15/α)\*(.0032 \* C1 \* α + .0062 \* (C1 \* α)2)\*(1 - .978NDVI4))  where C1 is a correction coefficient (=1.1) |
|  | Friction Velocity at meteorological station | |  |
|  | Wind Speed at blending height (200m) above the meteorological Station (m/s) | |  |
|  | Initial guess of Friction Velocity | |  |
|  | Initial value of Aerodynamic resistance to heat transport | |  |
| 1. Select DryPixel | Dry Pixel for Calibration | | The Dry Pixel is selected from the image by selecting e.g. the pixel with the lowest NDVI from the subset of pixels with highest TR [[1]](#footnote-1) |
| 1. Select WetPixel | Wet Pixel for Calibration | | The Wet Pixel is selected from the image by selecting e.g. the pixel with the highest NDVI from the subset of pixels with lowest TR iii |
| 1. TR Dry, TR Wet | Land Surface Temperature at the Dry Pixel, and Wet Pixel | | Imagery |
| 1. a | Calibration Coefficient a | | where |
| 1. b | Calibration Coefficient b | |  |
| 1. dT | Temperature difference between z1 and z2 (K) | |  |
| 1. T2\_Dry | Air temperature at dry pixel at height z2 | | Use TR at Dry Pixel for the initial value of |
| 1. Air Pressure Dry () | Air Pressure at Dry Pixel (hPa); use | | where ZDryPixel is the elevation of the DryPixel. |
|  | Air Density (kg/m3) | | T2,Pa, and ρair are iteratively updated in the Monin-Obhukov Iteration, see below |
| 1. H | Sensible Heat Flux (W/m2) | | where Cp =  *Initial value of Rah is taken from land use map or NDVI* |
| 1. L | Monin-Obhukov Length (dimensionless) | | i where g = |
|  | Monin-Obhukov Correction for heat transport for Unstable and Neutral Atmospheric Conditions (L<0) | | where  and z = |
|  | Monin-Obhukov Correction for momentm transport for Unstable and Neutral Atmospheric Conditions (L<0) | |  |
|  | Monin-Obhukov Correction for heat transport for Stable Atmospheric Conditions (L>0) | |  |
|  | Monin-Obhukov Correction for heat transport for Stable Atmospheric Conditions (L>0) | |  |
|  | Friction Velocity, corrected with Monin-Obhukov Correction | |  |
| 1. Rah | Aerodynamic resistance to heat transport, corrected with Monin-Obhukov Correction | |  |
| ***Iteration: Repeat steps 13 through 22 until changes in H are <5%*** | | | |
| 1. Ʌop | Evaporative Fraction at overpass (dimensionless) |  | |
| 1. ET24 | 24 hour Evapotranspiration (mm/day) | where ρw is density of water (kg/m3), λ is latent heat of vaporization (J/kg). | |

1. (Messina, 2012) [↑](#footnote-ref-1)