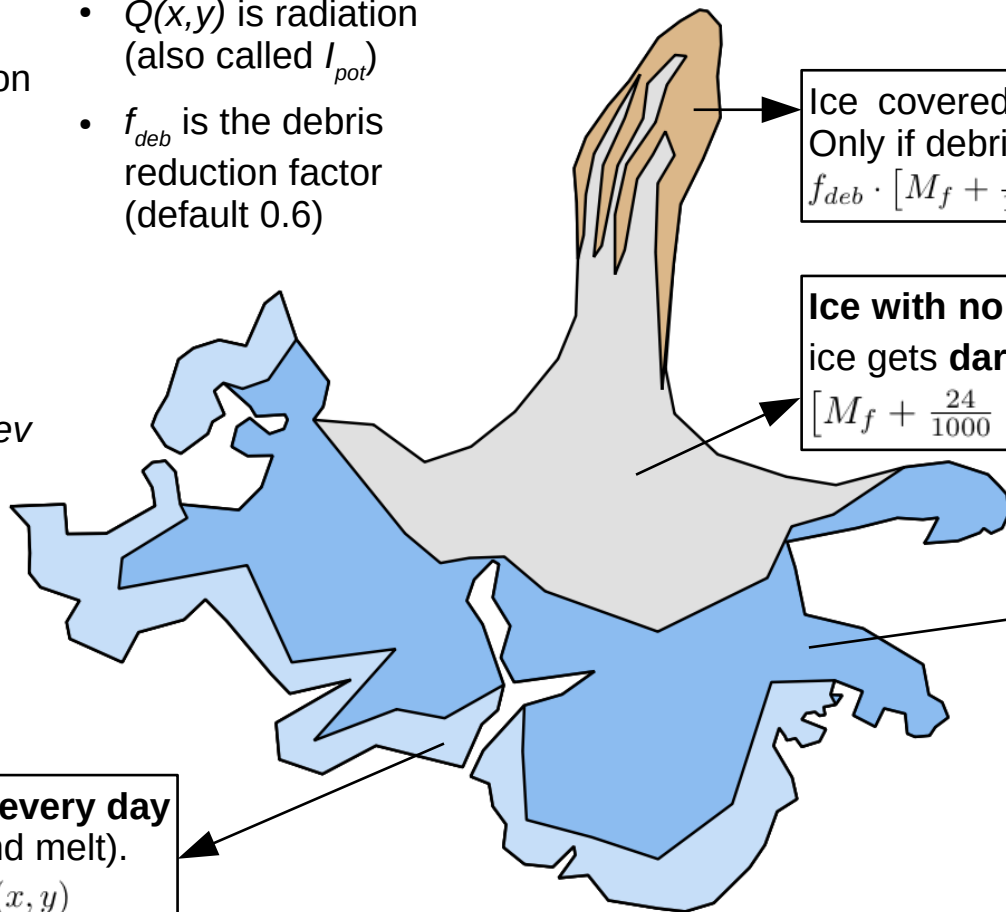


Formulas used to calculate glacier melt in DMBSim

NOTES

- M_f is the melt factor
- r_i , r_f and r_s are the radiation factors. $r_f = (r_s + r_i) / 2$
- $T(x,y)$ is the daily mean temperature, **only when** $> 0\text{ }^{\circ}\text{C}$ (else no melt)
- $a_i(x,y) = 1$ (= no effect) if you don't set parameter *albedo_ice_decrease_elev* in *set_params*
- $Q(x,y)$ is radiation (also called I_{pot})
- f_{deb} is the debris reduction factor (default 0.6)



Ice covered with **thick debris (less melt)**. Only if debris **shapefile** is used.

$$f_{deb} \cdot \left[M_f + \frac{24}{1000} \cdot r_i \cdot Q(x,y) \right] \cdot T(x,y)$$

Ice with no debris. You can use $a_i(x,y)$ if the ice gets **darker** on the tongue (**more melt**).

$$\left[M_f + \frac{24}{1000} \cdot r_i \cdot a_i(x,y) \cdot Q(x,y) \right] \cdot T(x,y)$$

Firn surface. Only if firn **shapefile** is used and only when it is not covered by seasonal snow.

$$\left[M_f + \frac{24}{1000} \cdot r_f \cdot Q(x,y) \right] \cdot T(x,y)$$

Snow surface (changes **every day** depending on snowfall and melt).

$$\left[M_f + \frac{24}{1000} \cdot r_s \cdot Q(x,y) \right] \cdot T(x,y)$$