

GLACIAL GEOLOGY - FALL 1995  
Outline For Lecture 2.

GLACIER ICE

WHAT IS A GLACIER?

**How does it move? First, why does ice form?**

TRANSFORMATION (PATTERSON CHAP 2)

**Lapse rate - colder up high**

**Area of net snow accumulation**

Cold - metamorphic processes

Warm - refreezing

MASS BALANCE (CLASS)

**Input vs. output**

Accumulation Processes

Ablation Processes

Yearly Balance (handout Fig. 4.1)

**Glacier Zones - question 1 related to this, handout Accumulation. snow to ice (handout Fig 2.1)**

Mass balance. flow and shape (handout Fig. 4.8)

GLACIER TYPES (S&J CHAP 4)

Morphologic classification

By topography

Over topography

Flat lying (handout Fig 4.3)

Thermal classification

Freezing. Frozen. melting. Melted

Polar. subsolar. temperate

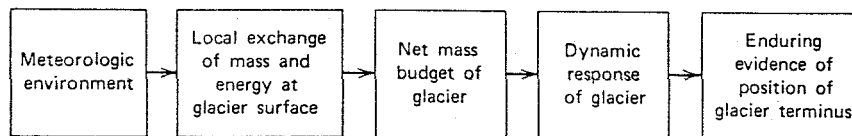


Figure 3-1 Chain of processes by Which the position of a glacier terminus is related to climate. (After M.F. Meier in H.E. Wright and Frey, eds., 1965a, p. 795.)

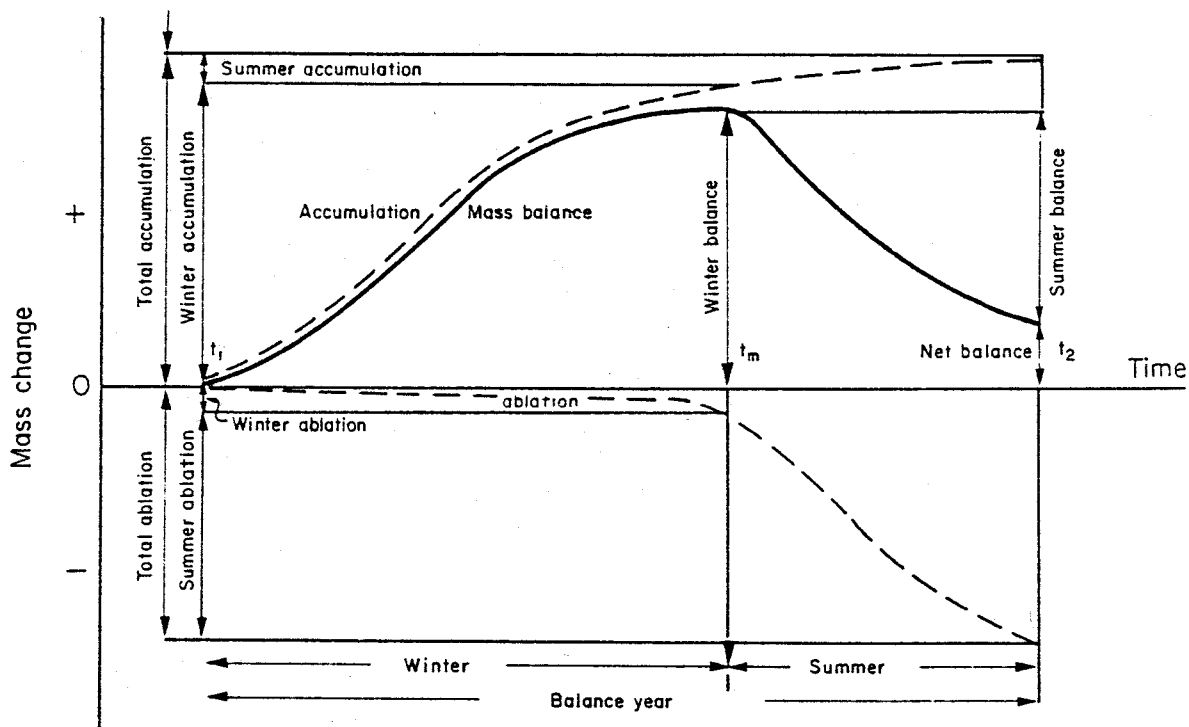


Fig. 4.1. Definitions of mass balance terms.

### THE TRANSFORMATION OF SNOW TO ICE

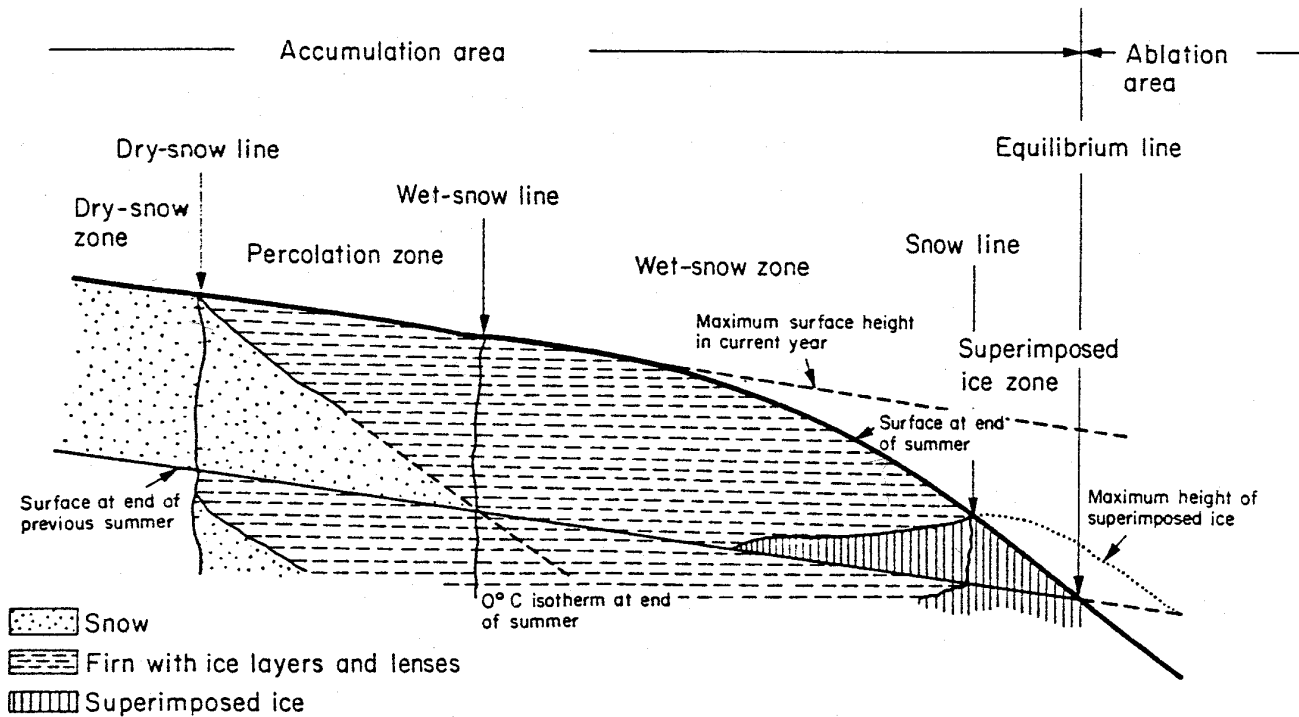


Fig 2.1 Zones in accumulation area. Based on Benson (1961) and Muller (1962).

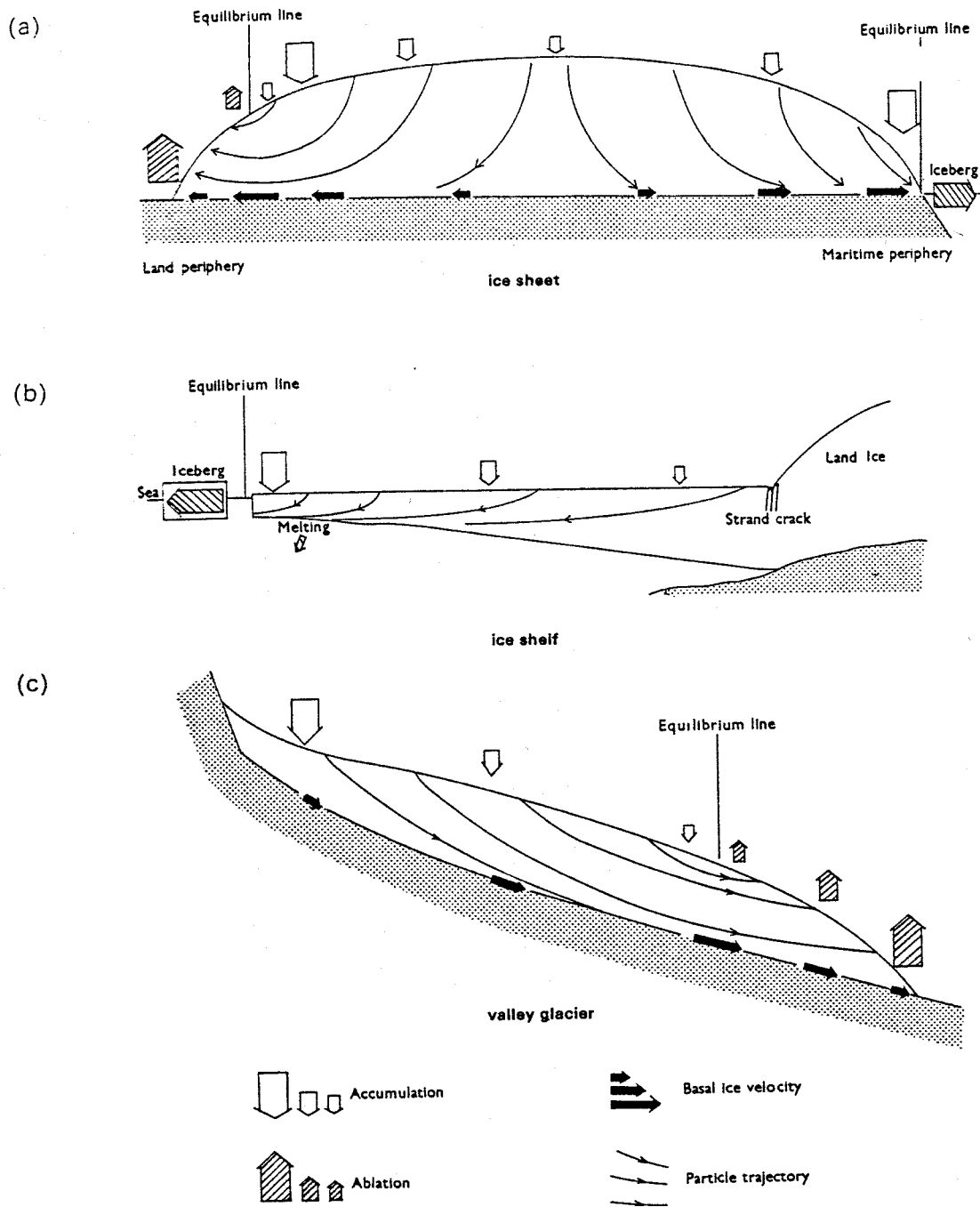


Figure 4.8  
 Models of (a) an ice sheet, (b) an ice shelf and (c) a valley glacier showing distribution of snow input and output and related flow characteristics. Basal slipping is assumed to occur in models (a) and (c) and at a maximum in the vicinity of the equilibrium line.

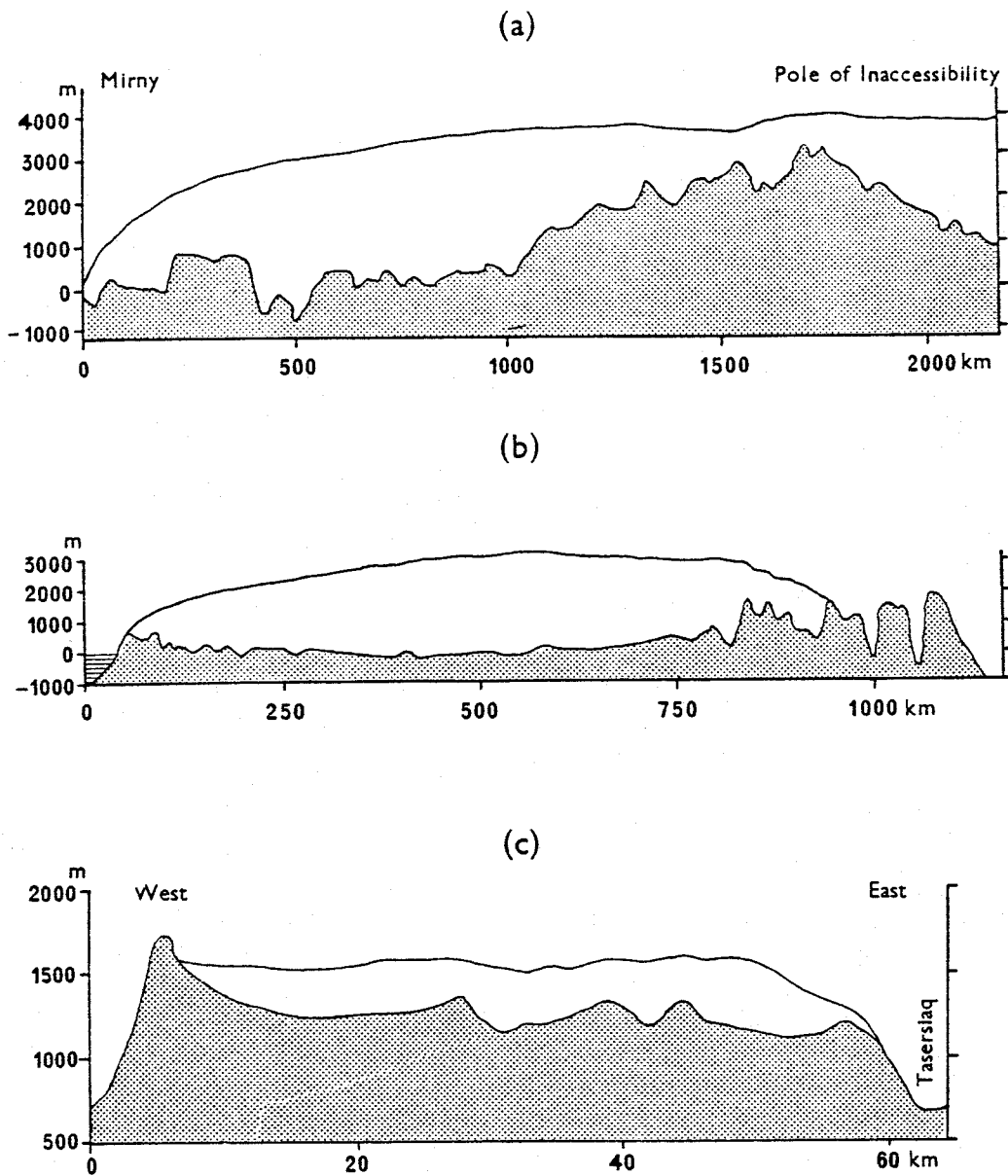


Figure 4.3  
 Profiles of ice domes and the underlying bedrock surface—(a) from Mirny to the Pole of Inaccessibility, east Antarctica (*Tolstikov, 1966*), (b) from Disko Bugt to Cecilia Nunatak, Greenland (*Fristrup, Univ. Washington Press 1966*), (c) Sukkertoppen ice cap, west Greenland (*Bull. J. Glacial. 1963*, by permission of the International Glaciological Society). Note the difference in scales.