

Lecture 5

# Soil Morphology

Tutor: Hawar Razvanchy

# Introduction

Soil Morphology is defined as a science that deals with the field description of soil using standard terminology.

# The Soil Profile

- **The Master Horizons:**
- Six **master soil** horizons are commonly recognized and are designated using the **capital** letters **O, A, E, B, C, and R**.
- **Subhorizon** may occur within a master horizon and these are designated by **lowercase** letters following the capital master horizon letter (e.g., **Bt, Ap, or Oi**).

# Suffix symbols

Suffix	Horizon
a	Highly decomposed organic matter.
d	Physical root restriction, noncemented, root-restricting layers (natural or human-made).
e	Organic material of intermediate decomposition.
g	Strong gleying.
h	Illuvial accumulation of organic matter.
i	Slightly decomposed of organic matter.
k	Accumulation of secondary calcium carbonates.
m	Pedogenic cementation

# Suffix symbols

<b>Suffix</b>	<b>Horizons</b>
<b>n</b>	<b>Accumulation of sodium.</b>
<b>p</b>	<b>Tillage or other disturbance.</b>
<b>q</b>	<b>Accumulation of silica.</b>
<b>ss</b>	<b>Presence of slickensides.</b>
<b>t</b>	<b>Accumulation of clay.</b>
<b>w</b>	<b>Development of color and structure.</b>
<b>x</b>	<b>Fragipan character.</b>
<b>y</b>	<b>Accumulation of gypsum.</b>
<b>z</b>	<b>Accumulation of salts more soluble than gypsum.</b>

# Bx vs Bm

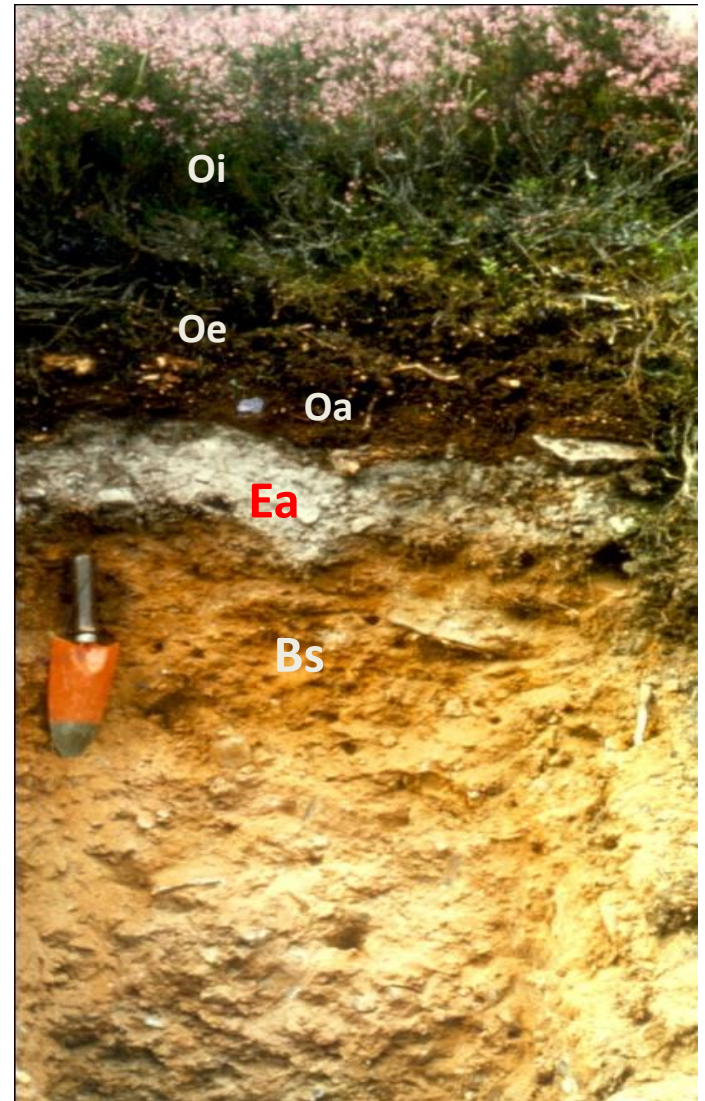
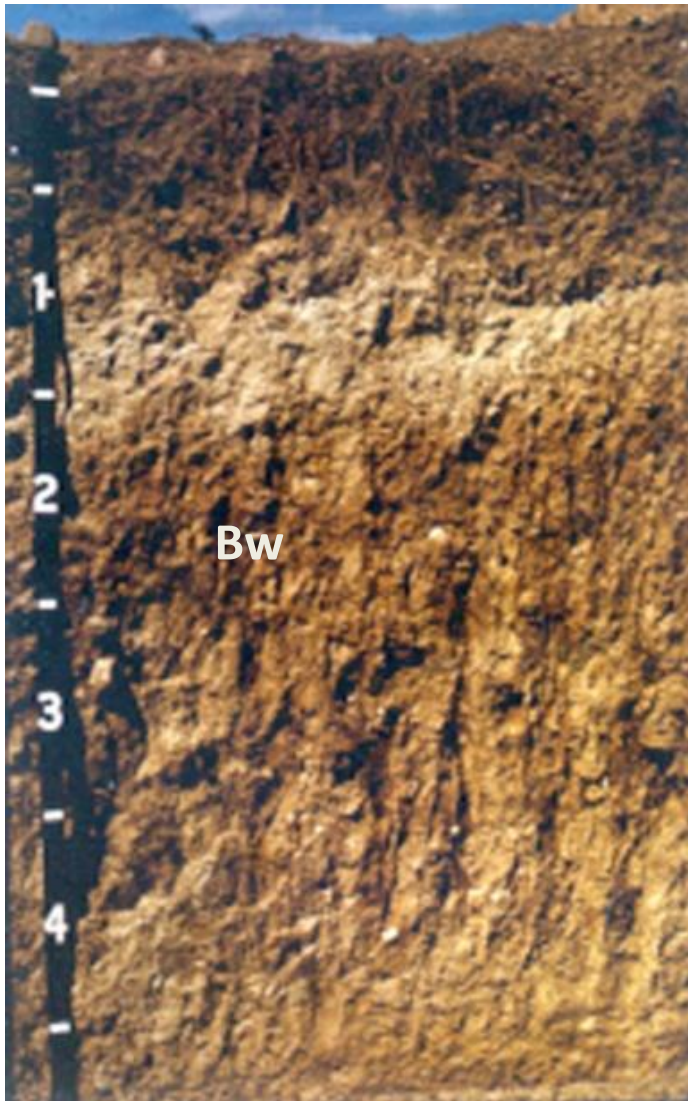
- Bx: fragipan properties, has a combination of firmness and brittleness and commonly a **higher bulk density** than the adjacent layers. **Some part** of the layer is physically root-restrictive.
- Bm: pedogenic cementation, horizons that are **90 percent or more cemented**, although they may be **fractured**. The cemented layer is **physically root restrictive**.

Oi

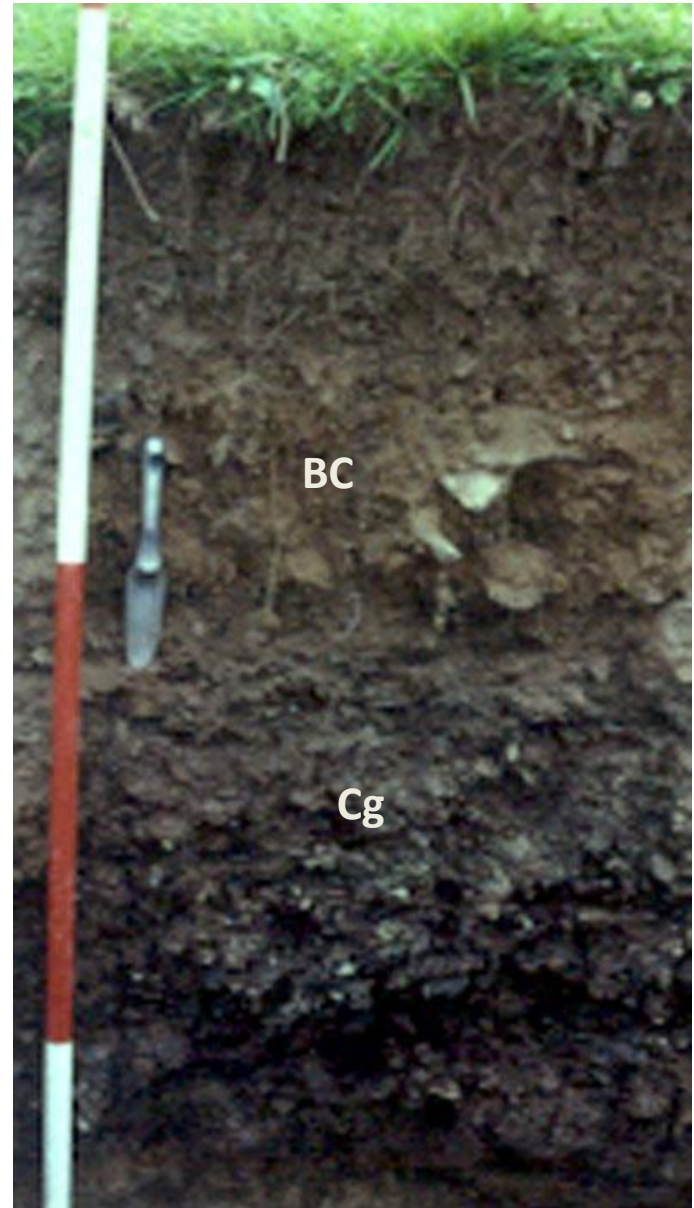
Oe



Forest Floor Litter = Oi horizon







# Transitional Horizons

- Horizons **dominated** by properties of **one master** horizon but having **subordinate** properties of another
- **Two** capital letter symbols are used as EB, BE, BC.
- Master horizon that is given first designates the kind of horizon whose properties **dominate** the transitional horizon
- EB has characteristics of **both** an overlying E and an underlying B horizons, but is more like E than B.

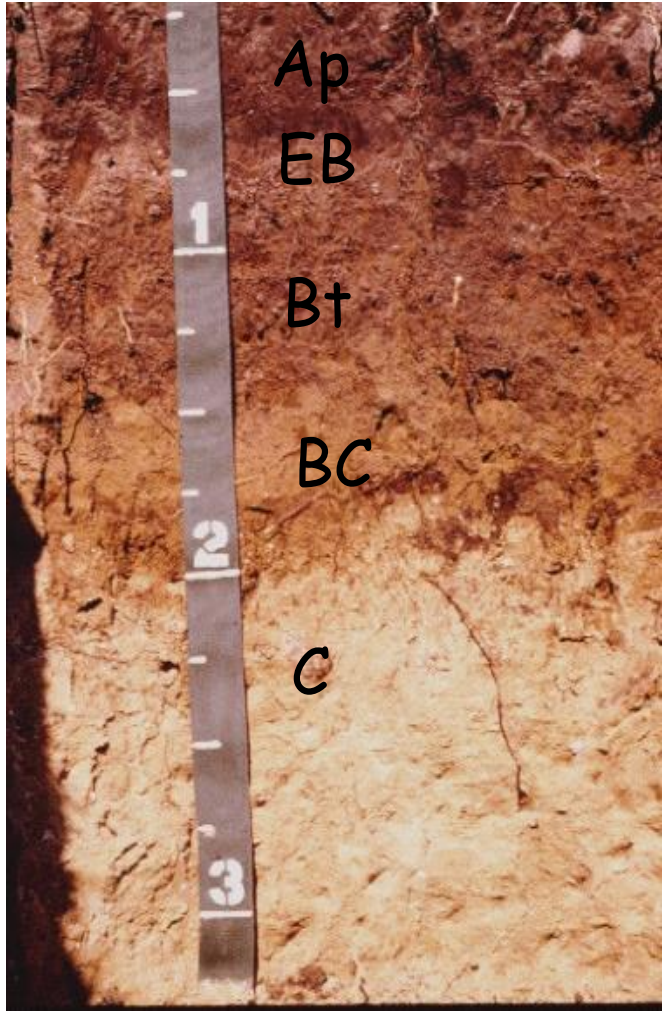
Dominated

EB

BE

BC

subordinated

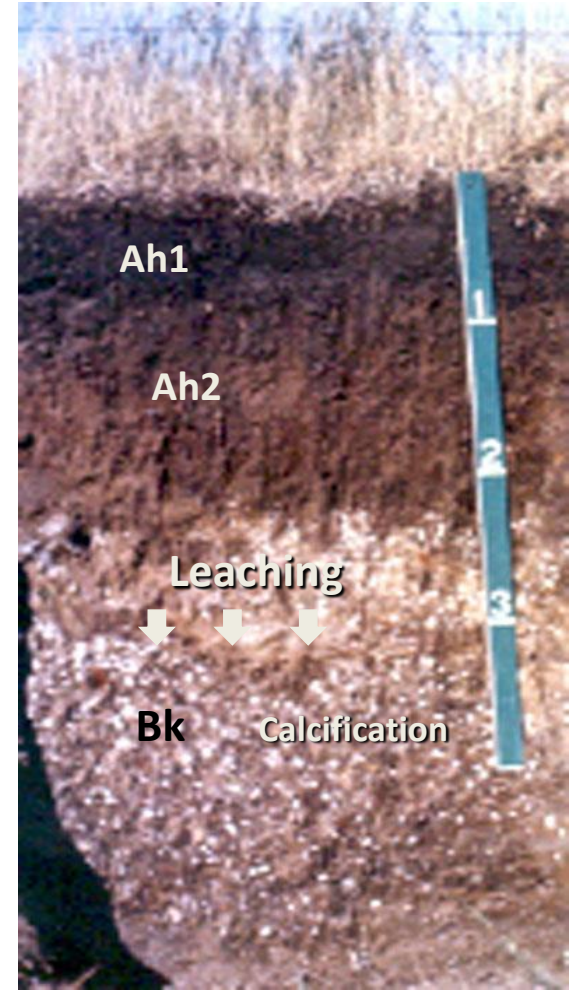
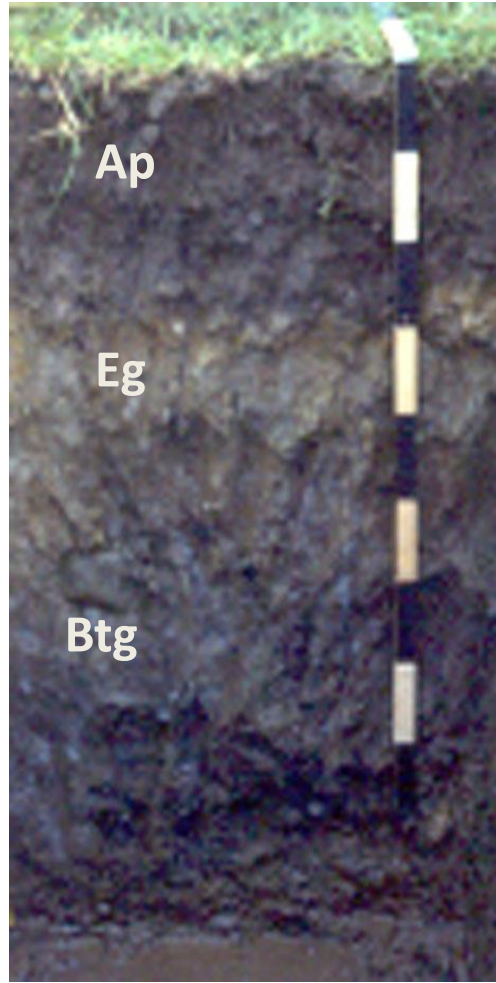
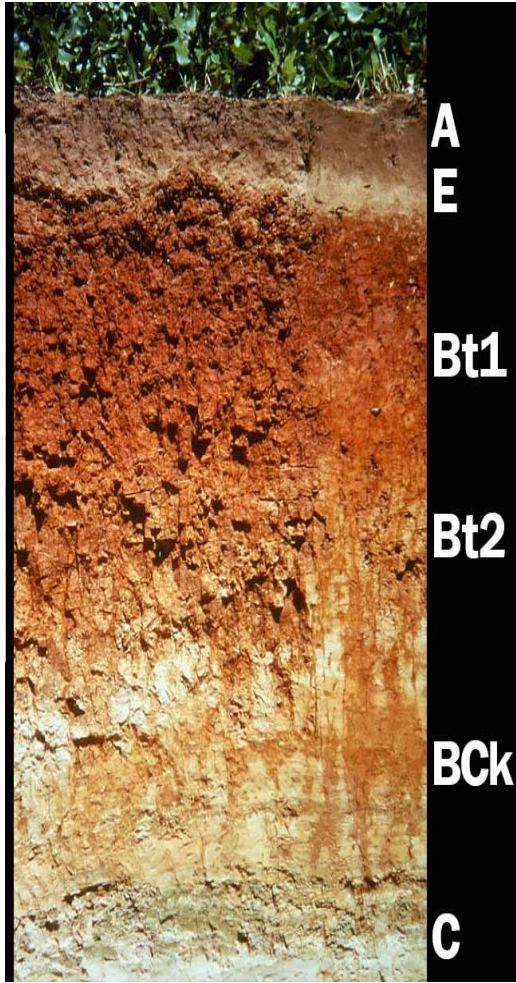


# Combination Horizons

- Horizons with **two distinct parts** that have recognizable properties of the two kinds of master horizons indicated by the capital letters
- The two capital letters designating such **combination horizons** are separated by a symbol of (/), e.g., E/B, B/E, or B/C
- Most of the individual parts of one horizon component are **surrounded** by the other
- The first symbol is that of the horizon with the **greater volume**

# Vertical subdivision

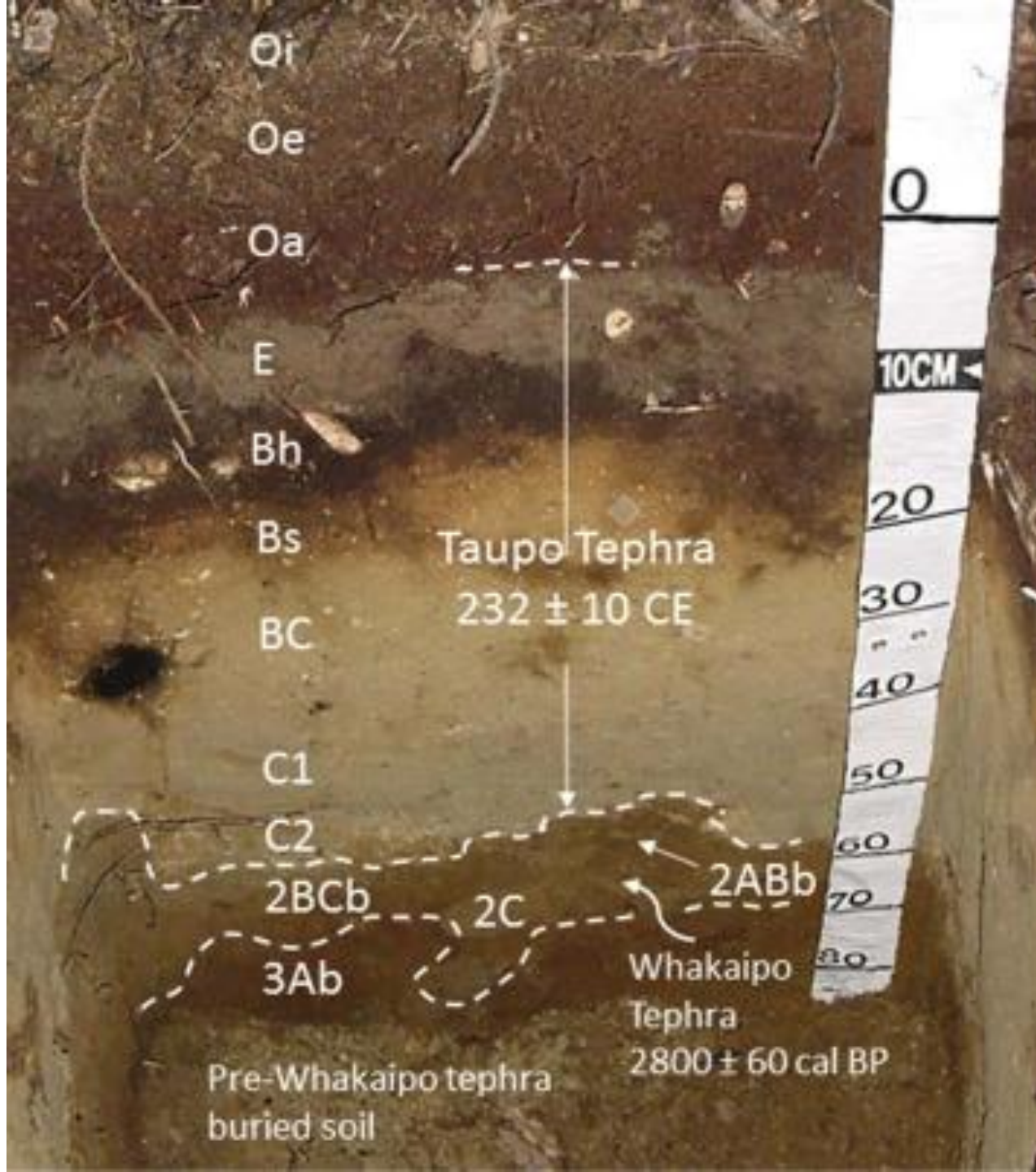
- Arabic **numerals** followed capital letters to indicate the vertical subsequent of horizons
- For example, successive layers could be C1, C2, C3, and so on, or, if the lower part is gleyed and the upper part is not, the designations could be C-Cg1-Cg2-R



# Discontinuities

- Arabic numerals are used as **prefixes** to indicate discontinuities
- If the R layer would not produce material like that in the solum, the number prefix is used, as in A-Bt-2C-2R
- If part of the solum formed in-place, R is given the appropriate prefix: Ap-Bt1-2Bt2-2Bt3-2C1-2C2-2R.





Oi

Oe

Oa

E

Bh

Bs

BC

C1

C2

2BCb

2C

3Ab

2ABb

Taupo Tephra  
232 ± 10 CE

Whakaipo Tephra  
2800 ± 60 cal BP

Pre-Whakaipo tephra  
buried soil

0

10CM

20

30

40

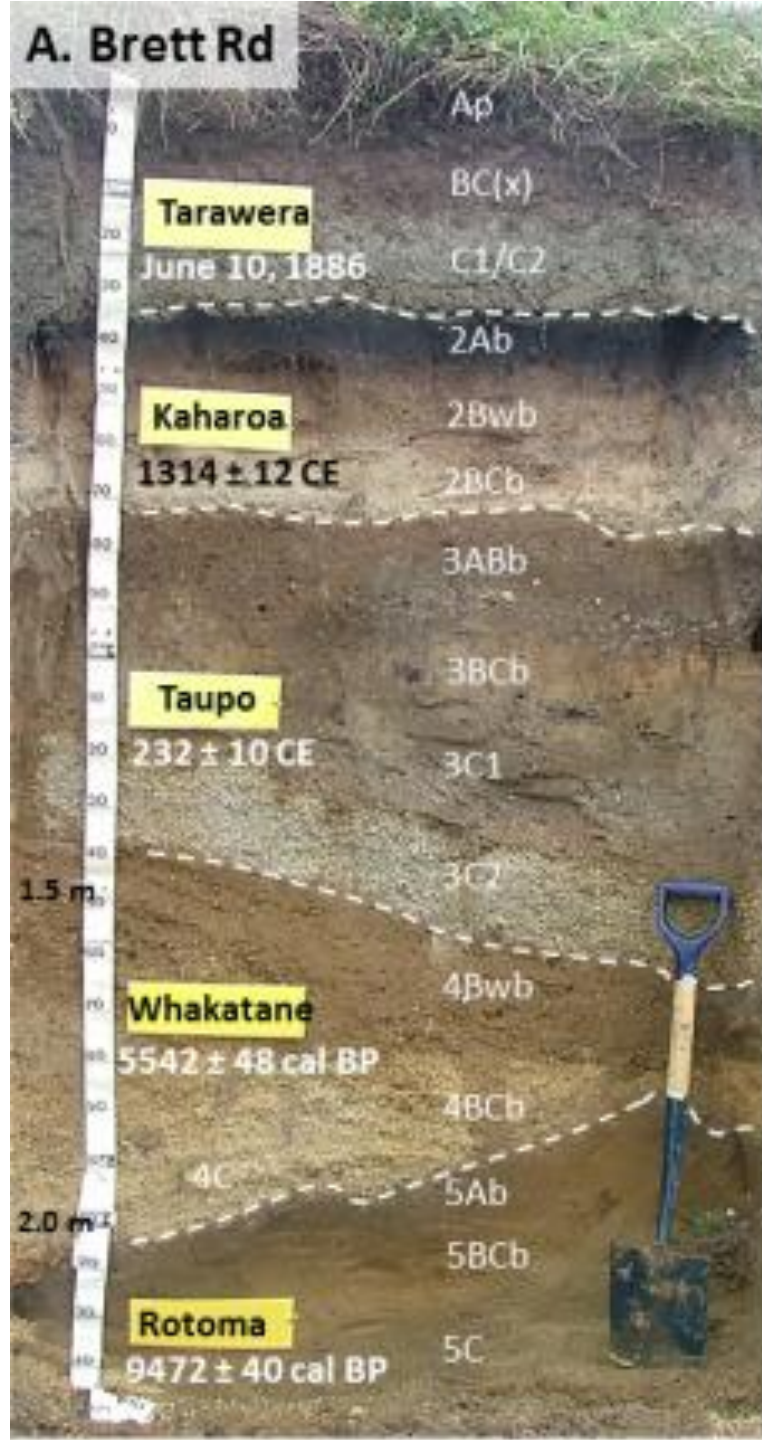
50

60

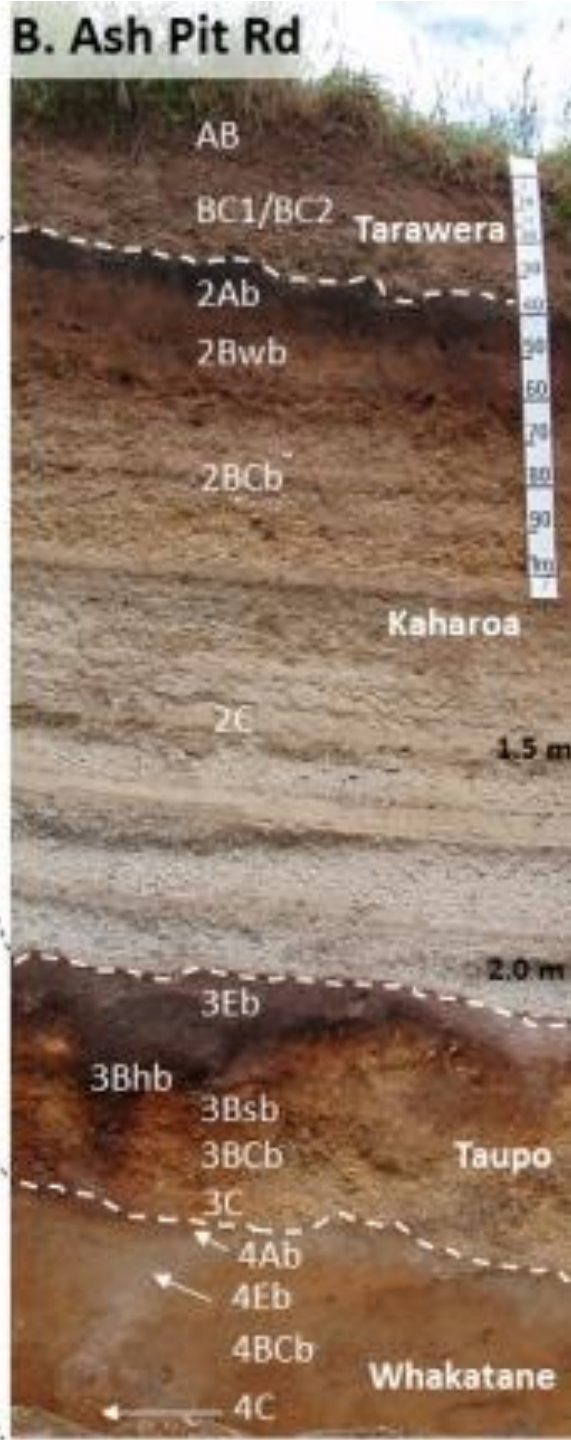
70

80

### A. Brett Rd



### B. Ash Pit Rd



Questions?