

Fig. 5.3

# Earthquake and Plate Boundaries

## Normal Events *also called dip-slip*

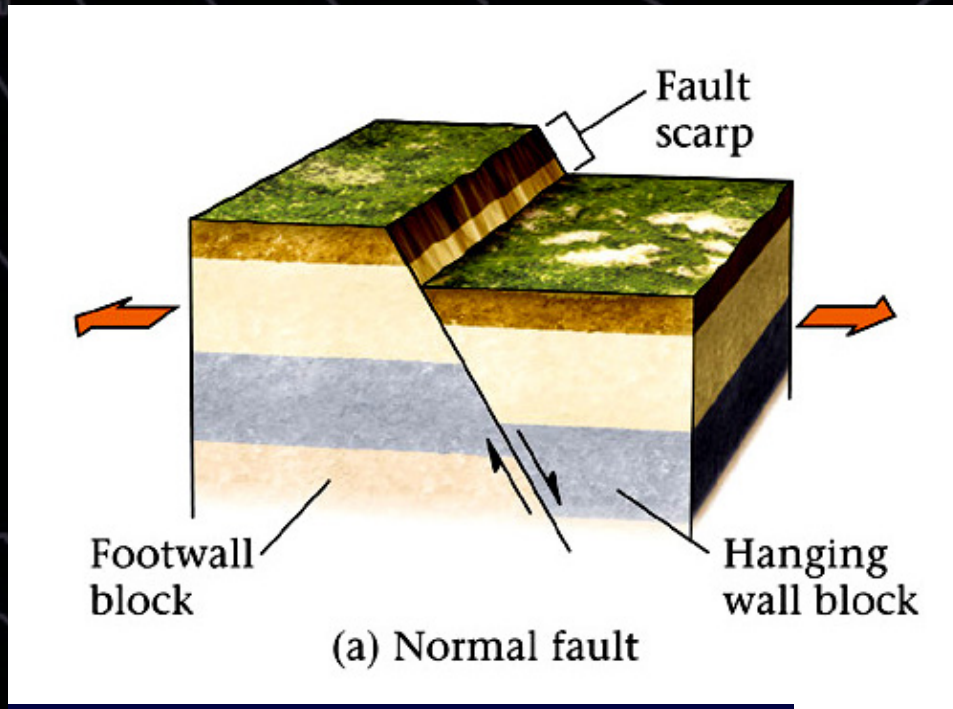
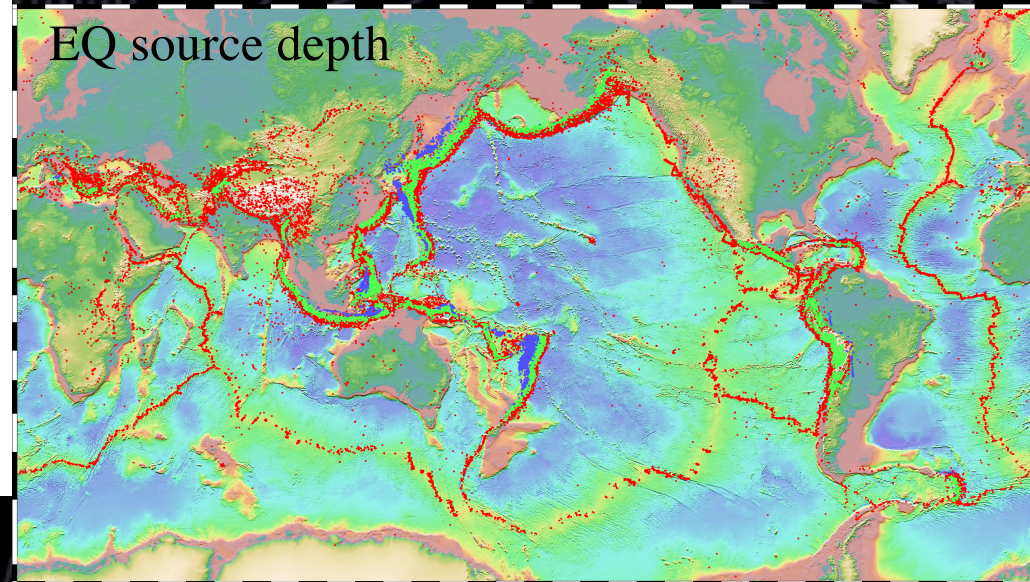


Image: S. Marshak "Earth, Portrait of a Planet"



- extension
- divergent plate boundaries; e.g. mid-ocean ridges
- mostly shallow
- tsunami if in oceans



Fig. 5.4

# Earthquake and Plate Boundaries

## Reverse and Thrust Events

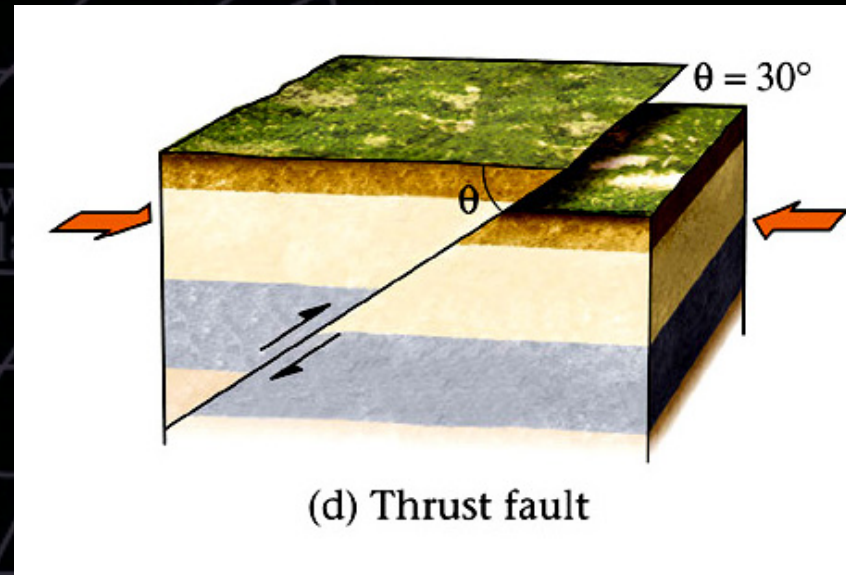
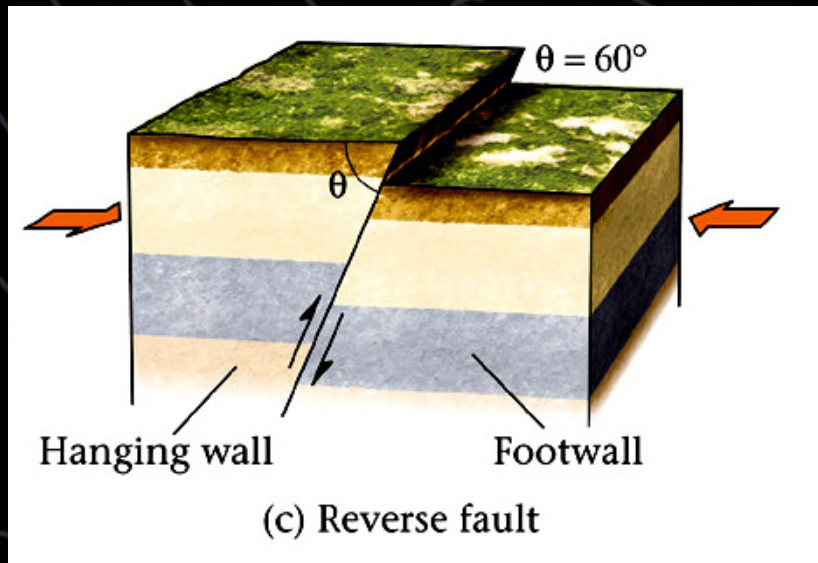


Image: S. Marshak "Earth, Portrait of a Planet"

reverse faults/events

- compression
- convergent plate boundaries
- shallow to deep
- tsunami if in oceans

thrust events

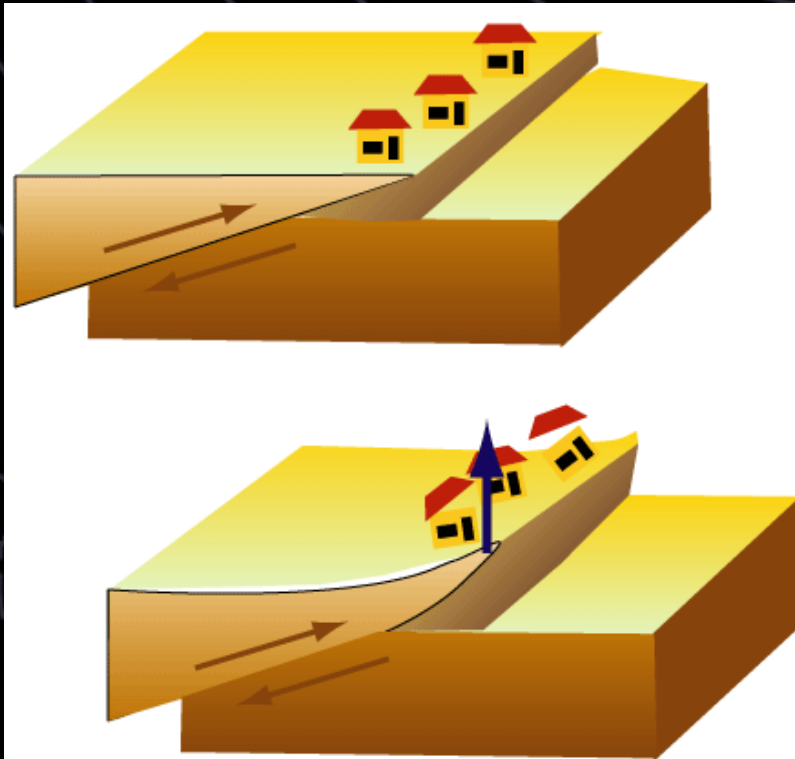
- dip angle less than  $45^\circ$

Fig. 5.5

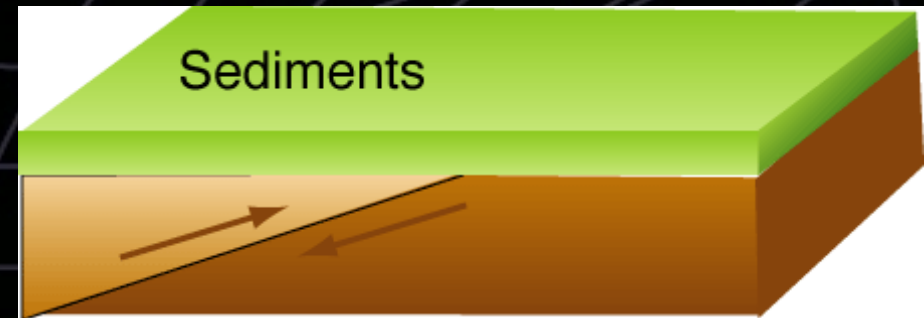
# Earthquake and Plate Boundaries

## Shallow and Blind Thrust Events

Fig. 5.6



!! very dangerous !!



shallow thrust

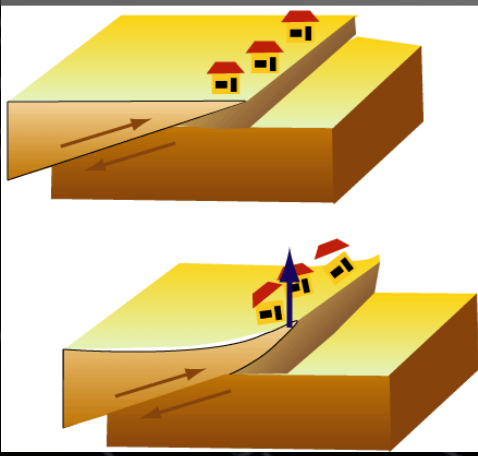
- very small dip angle
- high accelerations at hanging tip

blind thrust

- fault covered by sediments (e.g. Northridge 1994)



# Shallow Thrust: 17 Jan 1994 Northridge



Images: wikipedia

- shallow thrust
- Mw 6.7
- highest ever instrumentally recorded ground accelerations ( $1.8g/16.7m/s^2$ ) in North American urban area

SIO15-14: Lecture 5 Earthquakes and Plate Bo





# Fig. 5.7a Earthquake and Plate Boundaries

Fig. 4.28  
study  
guide!

## Strike-Slip Events

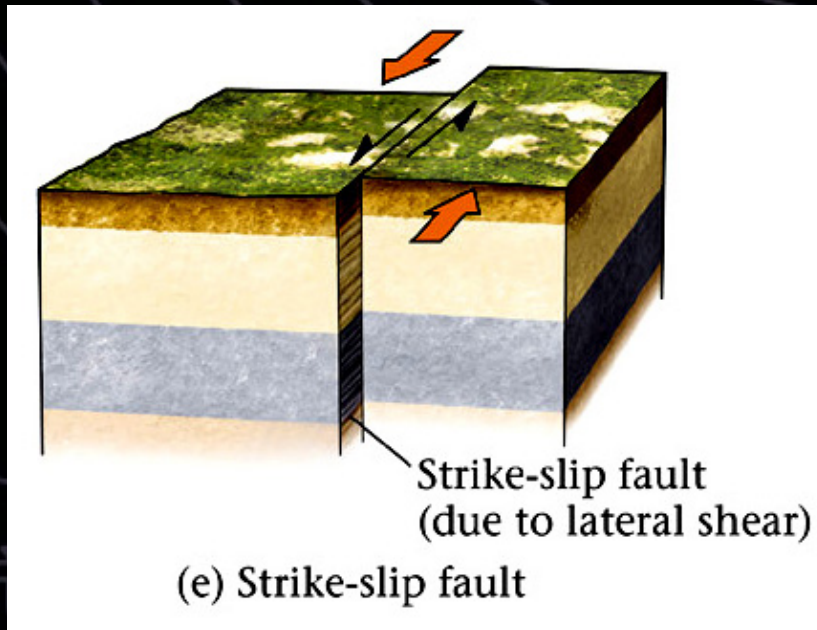


Image: S. Marshak "Earth, Portrait of a Planet"

- only lateral motion
- along transform boundaries
- right-lateral/left-lateral
- SAF is right-lateral
- San Diego is on Pacific Plate



Image: S. Marshak "Earth, Portrait of a Planet"

- does not trigger tsunami

SIOP... Boundaries