

# Hard Engineering

## Learning Objective:

- **Assess** the *costs* and *benefits* of hard engineering



## Learning Outcomes:

- **Define** what hard engineering is
- **Describe** the costs and benefits of hard engineering
- **Judge** the best type of management

How might a church tower end up here?



What's going on here then?



# Sand blasting to remove the build up of silt on the 3 - Gorges Dam



In China...

[Hoover Dam - San Andreas](#)



# Hard engineering ...

... involves using man-made structures to prevent or control the flow of rivers to prevent flooding.

Costly? Debate?

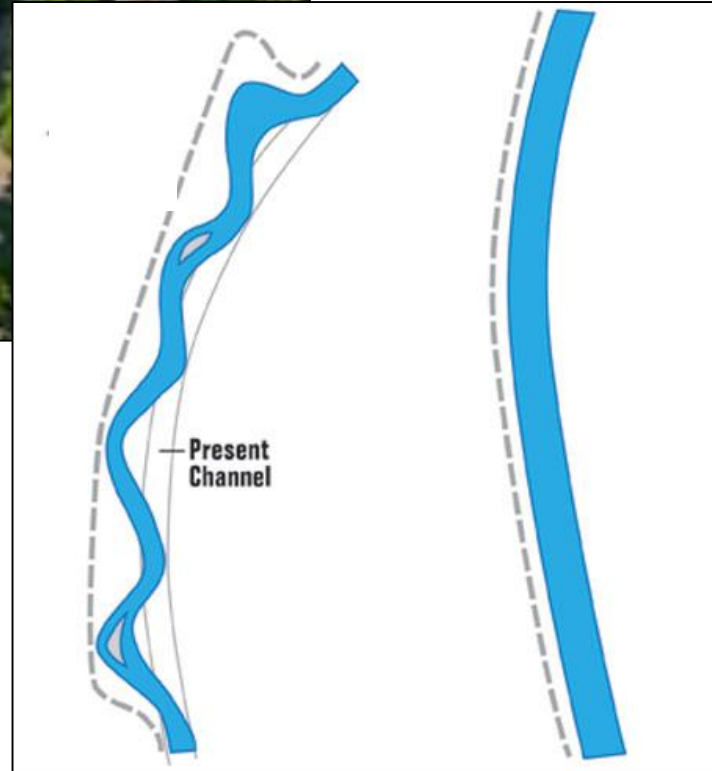
# Dams and reservoirs







# Channel straightening

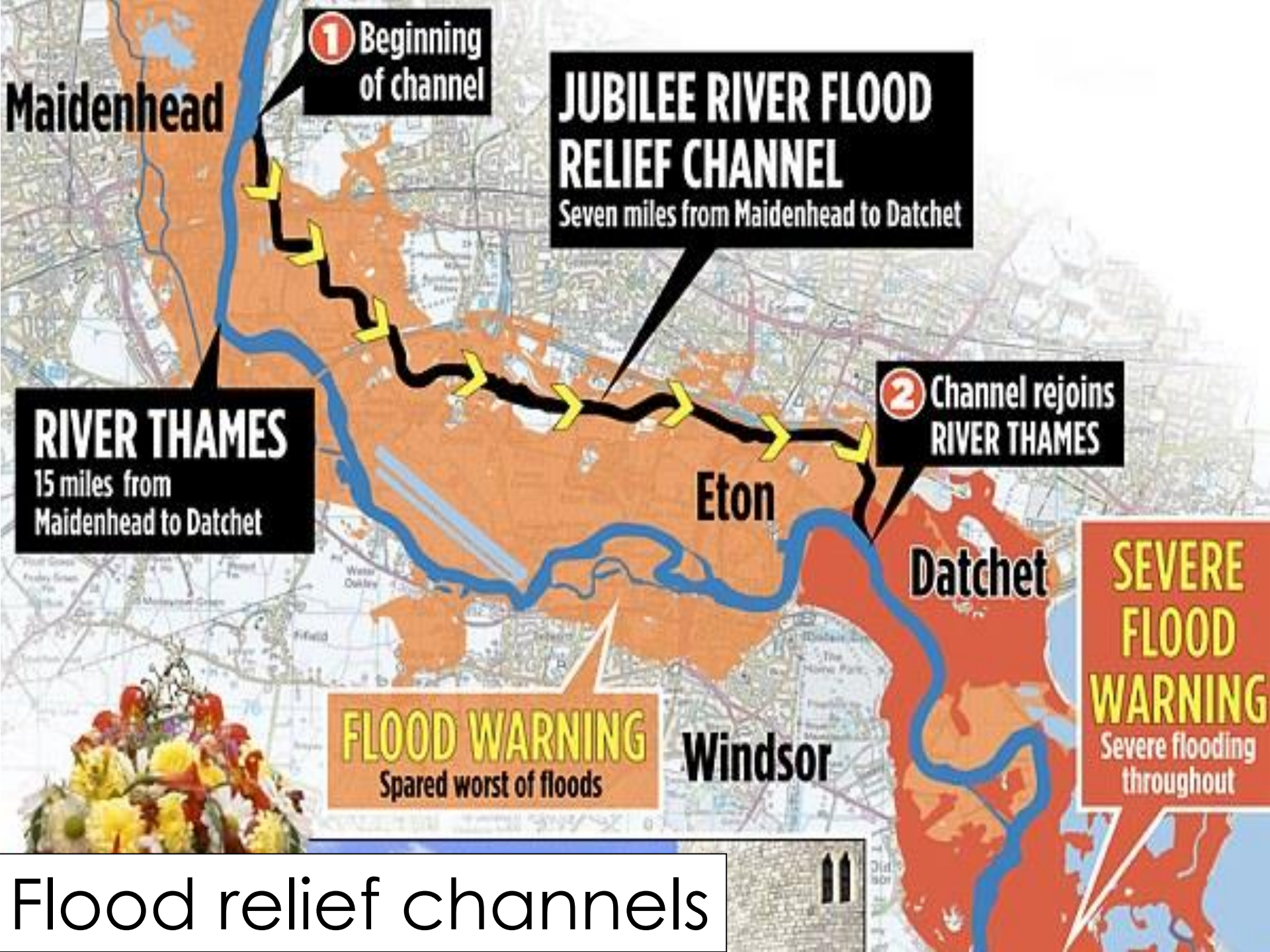




About 50 miles (80 km) across

# Embankments





**1** Beginning of channel

**JUBILEE RIVER FLOOD RELIEF CHANNEL**  
Seven miles from Maidenhead to Datchet

**RIVER THAMES**  
15 miles from Maidenhead to Datchet

**2** Channel rejoins RIVER THAMES

**FLOOD WARNING**  
Spared worst of floods

**SEVERE FLOOD WARNING**  
Severe flooding throughout

Flood relief channels

# Diagram A

