Bridge Scour: What is it and why do we care?

https://www.youtube.com/watch?v=9cwmaFO3030

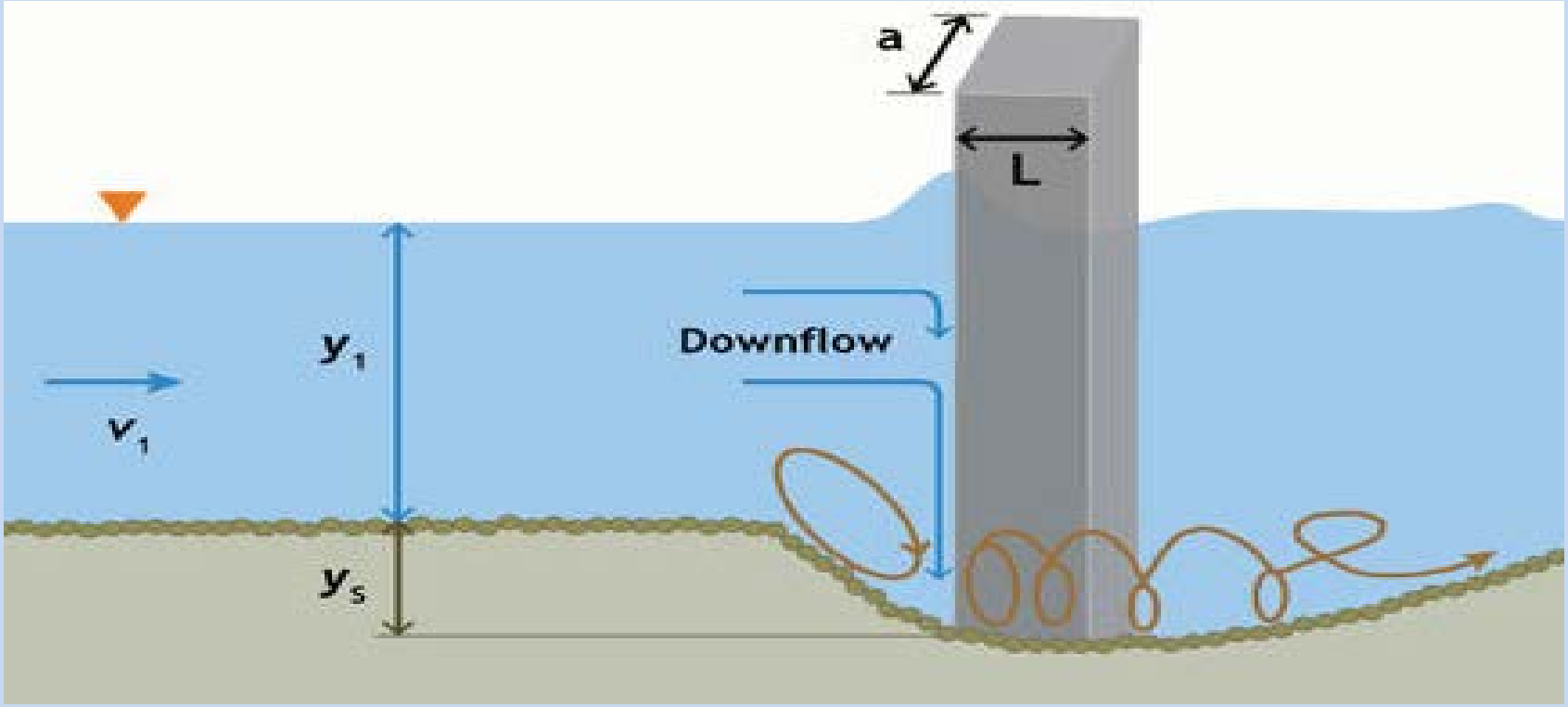
Bridge Scour:

- The removal or river bed material around bridge support structures such as piers and abutments

- **Scour is the primary cause of bridge failure:**
  - 60% of bridge failures in the U.S. are scour related (600 out of 1,000 failures over the past 30 years)

How does Scour Occur?

- As the stream velocity increases, there is streambed material that is being removed from around the piers and abutments

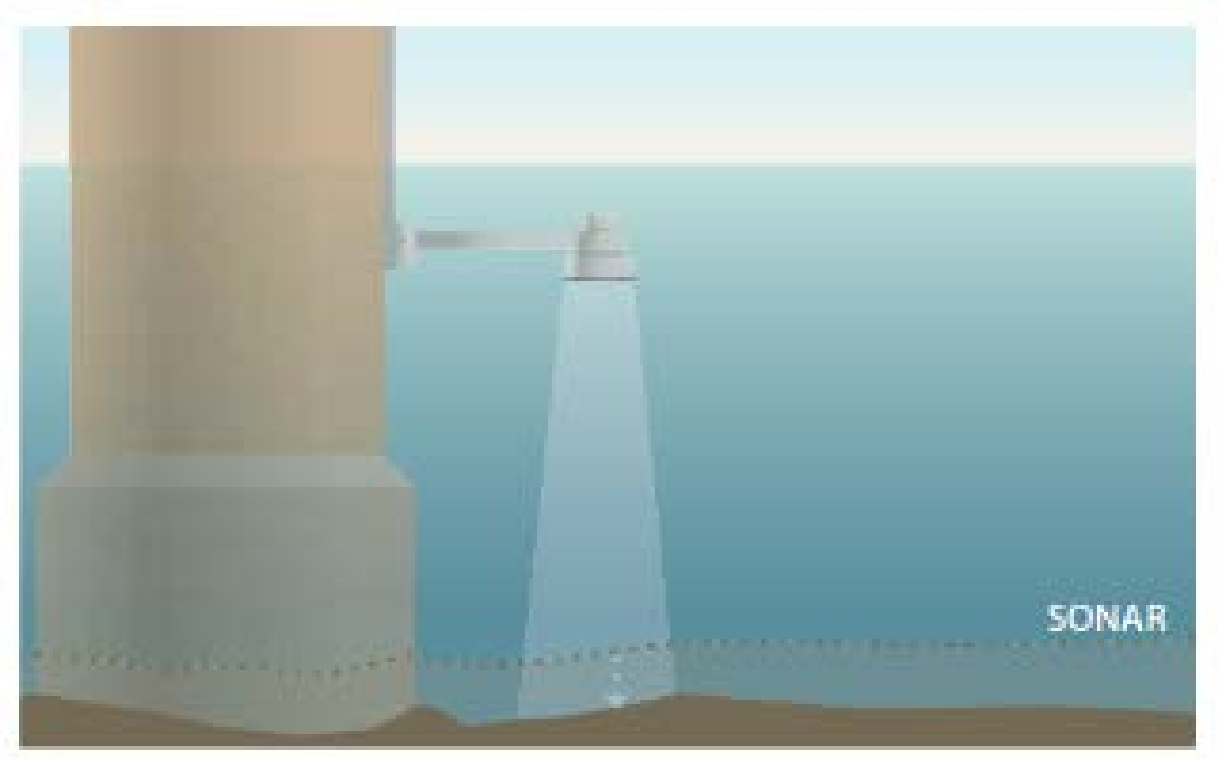


How is Scour Monitored?

- 4 Ways:
  - Sonar
  - Magnetic Sliding Collar
  - Float out Device
  - Echosounder

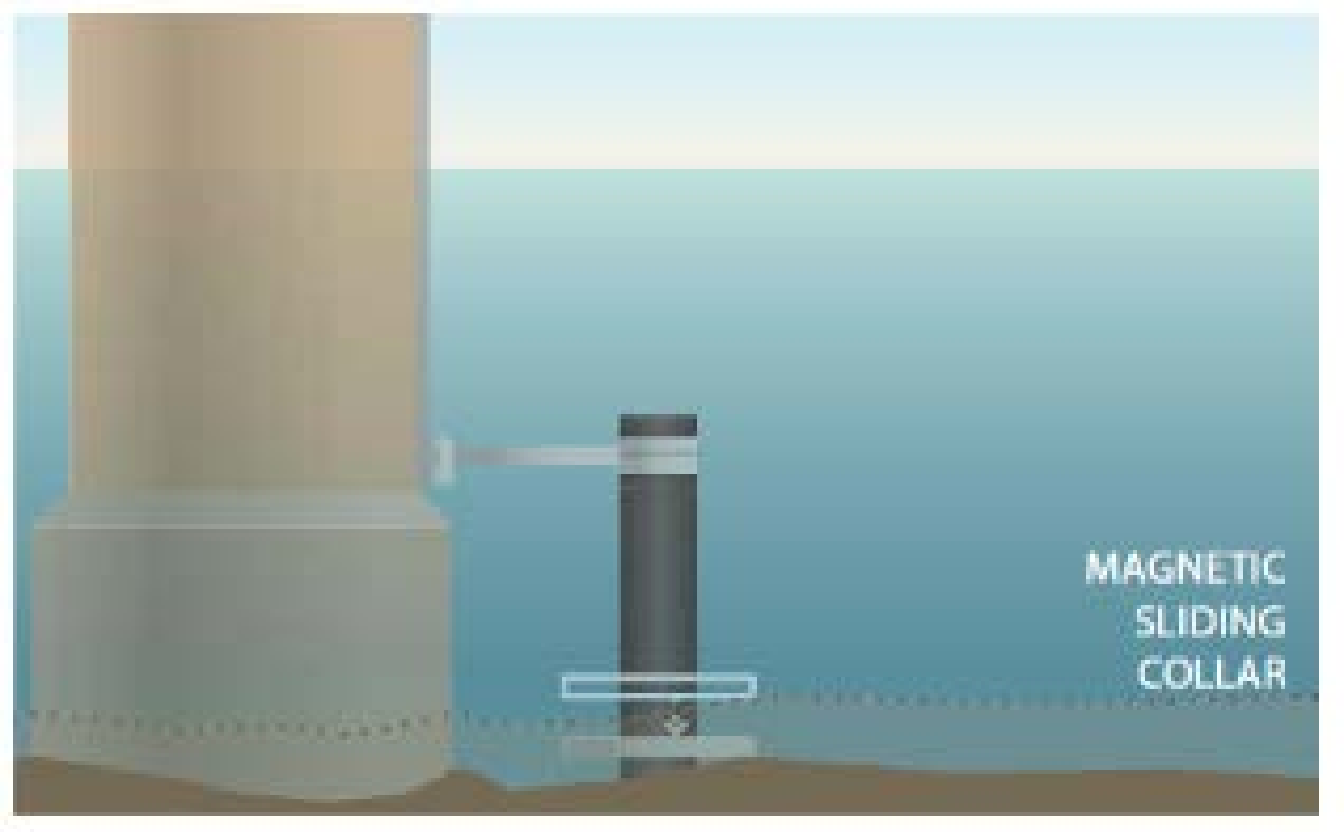
Sonar

- Pier mounted radar unit
  - Pings off of bottom of stream to measure riverbed elevation.



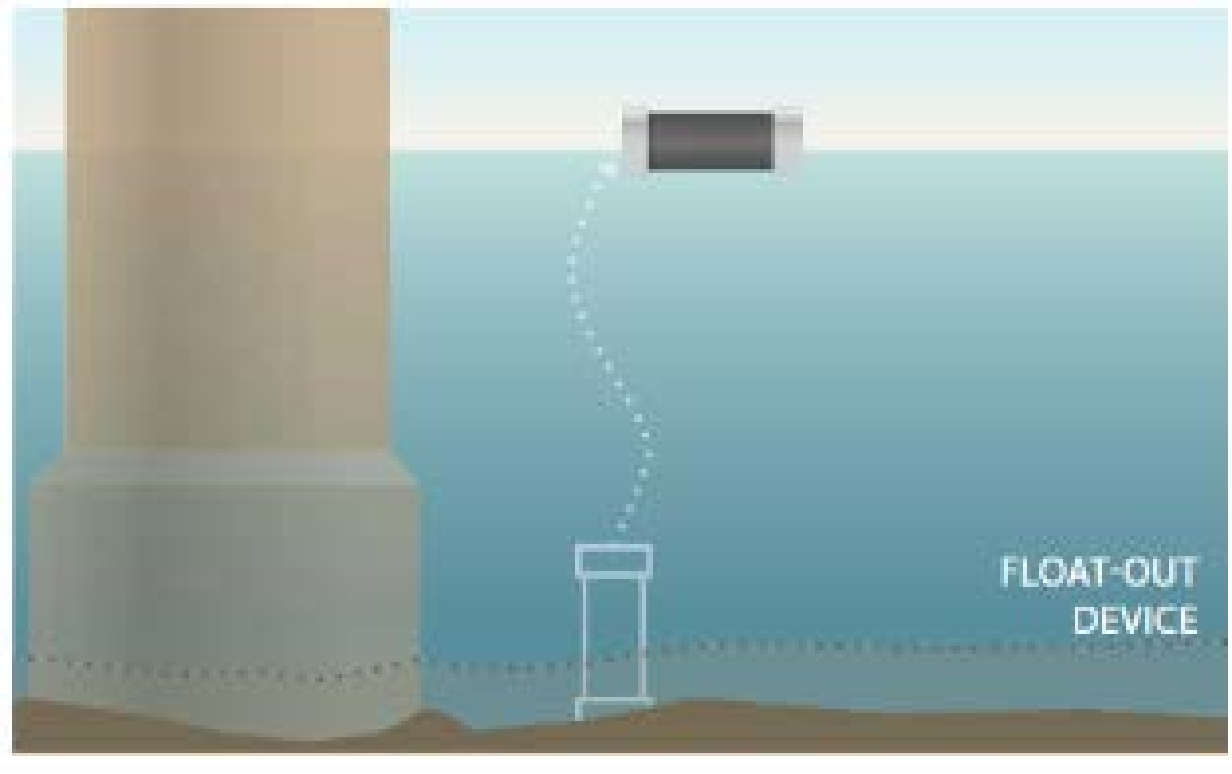
Magnetic Sliding Collar

- Magnet slides down metal shaft as bed material is removed during an event



Float Out Device

- Device is buried under stream bed and once material has been removed to that depth, a device floats to the surface



Echosounder

- Pings off of stream bottom just like sonar unit but is small enough to safely mount on bridge piers

Mount used by Alaska WSC

Velocity Sensor

- Sensor will be mounted on side of pier to measure water speed as it flow past pier

Velocity and Echosounder Integration

- Measure velocity and stream bed depth every 15 minutes
- As velocity increases measurements will increase from 15 minutes to up to every minute.
- If critical scour is reached DCP will transmit on random channel so proper authorities can be alerted