Large wood input, storage, transport, and burial in the Queets River

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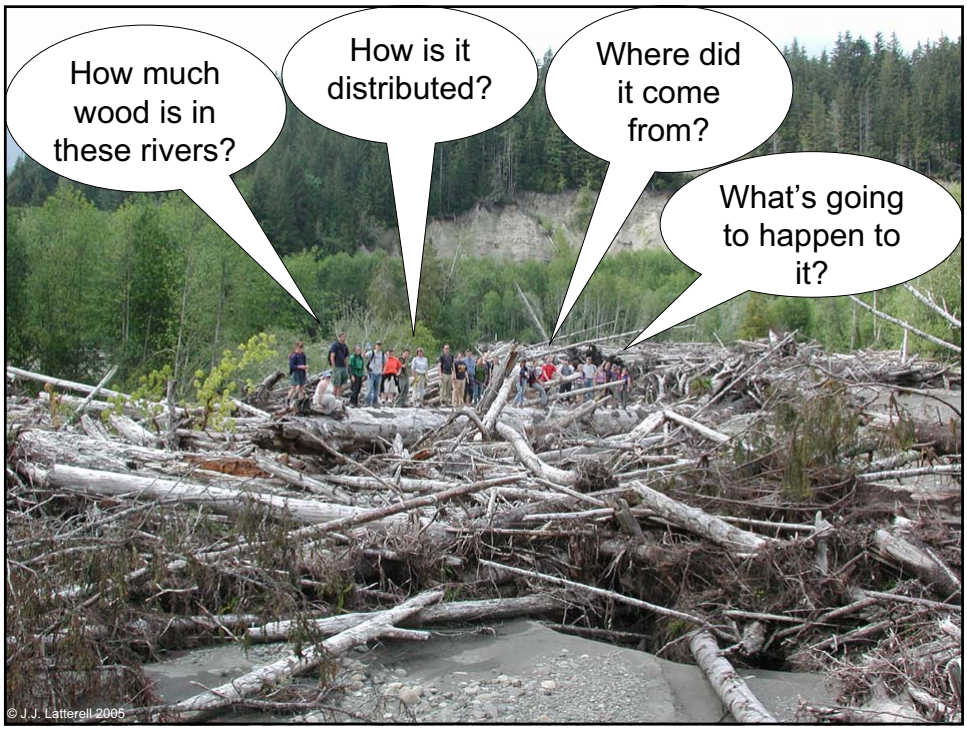

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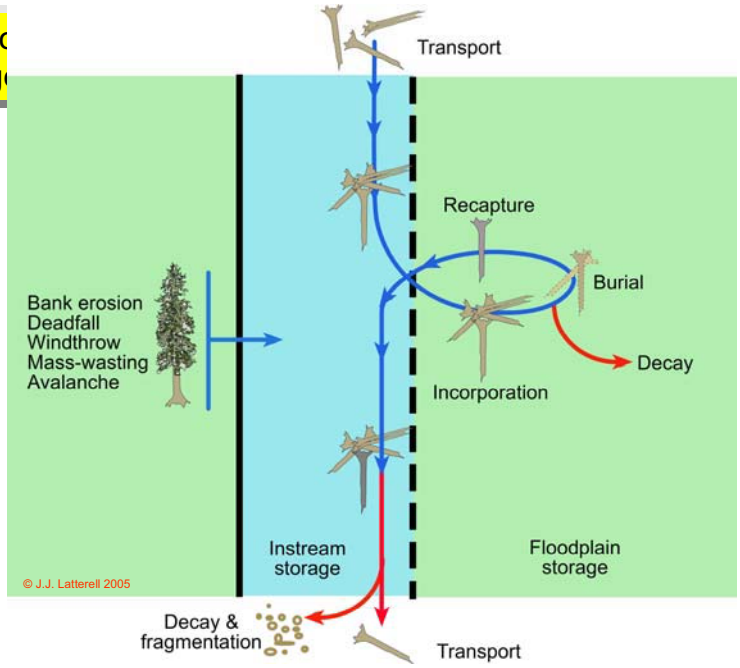
Transport
Recapture
Burial
Decay
Incorporation
Bank erosion
Deadfall
Windthrow
Mass-wasting
Avalanche
Instream storage
Floodplain storage
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Decay & fragmentation
Transport


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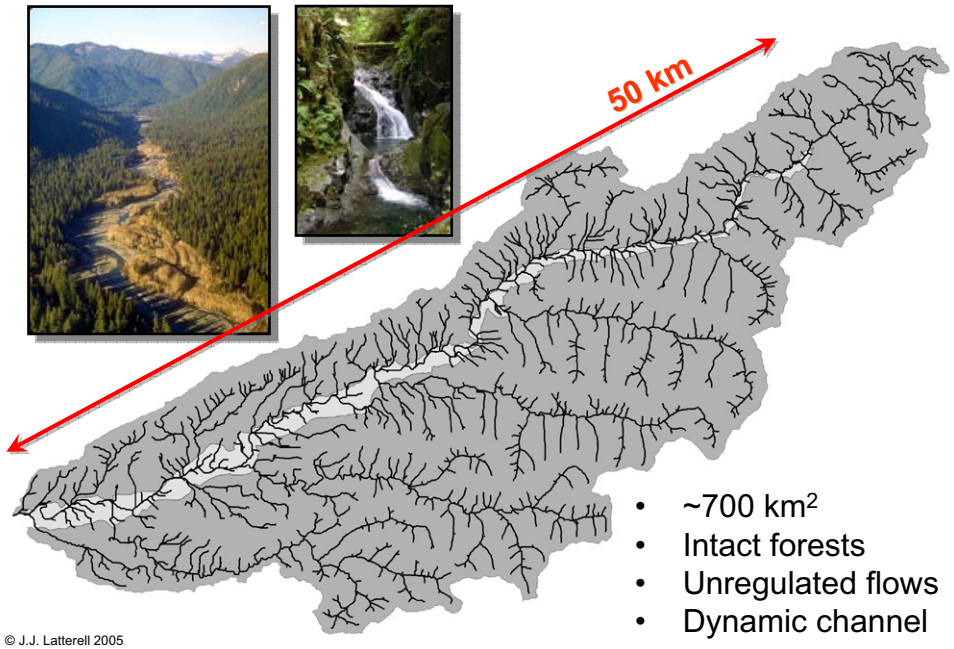
Objectives

We quantified…

1. Mechanism and rate of riparian wood input
2. Wood distribution, abundance, and characteristics
3. Transport rate & distances
4. Burial and recapture

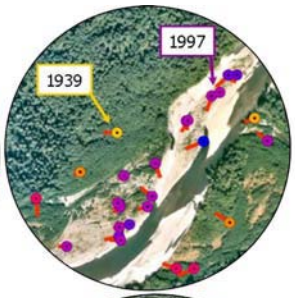
Queets River – Olympic National Park



- ~700 km^2
- Intact forests
- Unregulated flows
- Dynamic channel

Methods

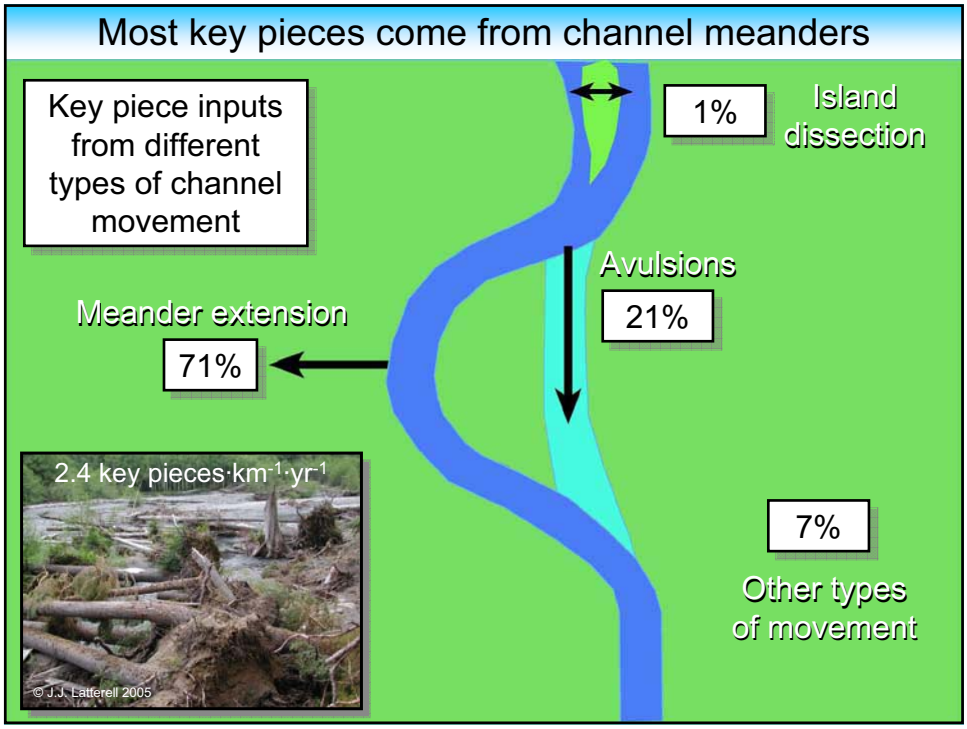
Analyzed airphotos



Relocated old key pieces

Surveyed field plots

Monitored logjams


Most key pieces come from channel meanders
Key piece inputs from different types of channel movement
1%
Island dissection
Avulsions
21%
Meander extension
71%
2.4 key pieces·km-1·yr-1
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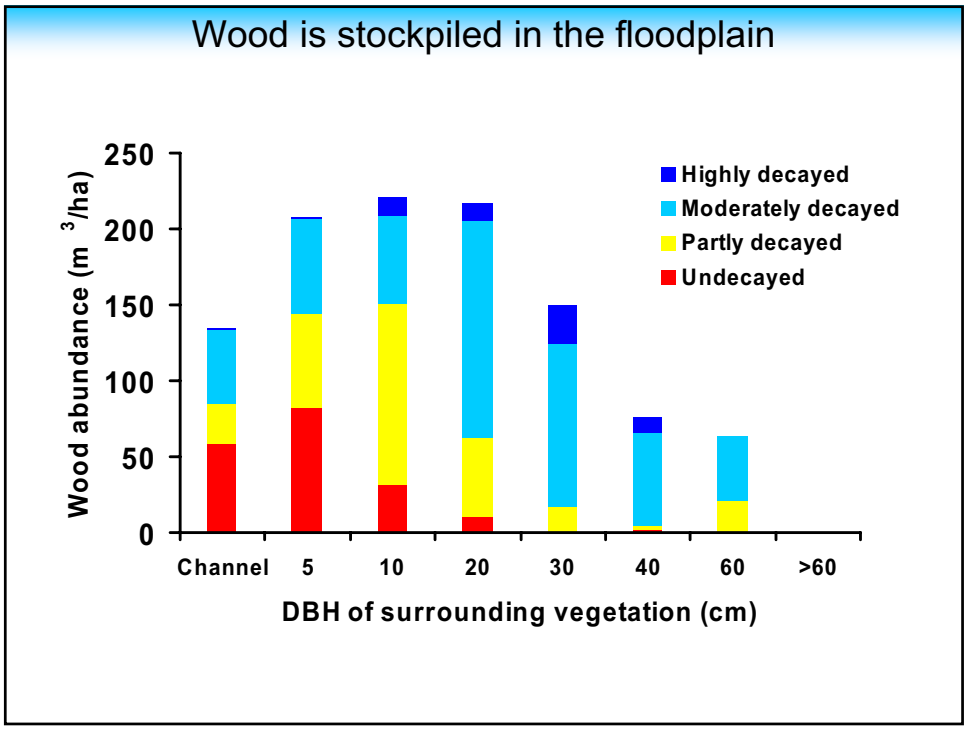
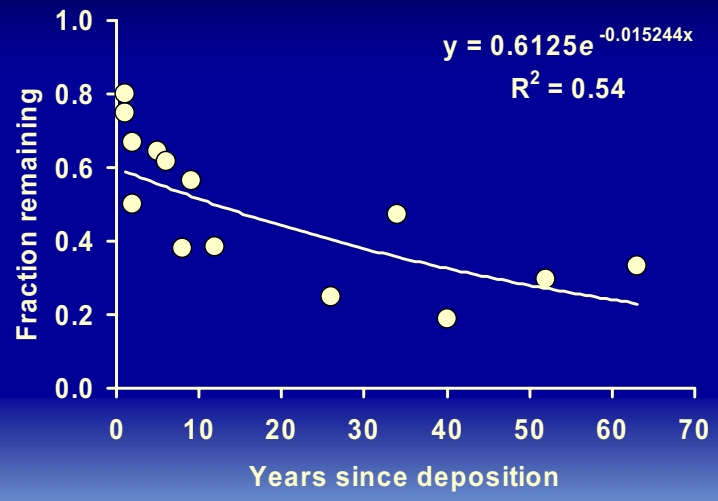
7%
Other types of movement

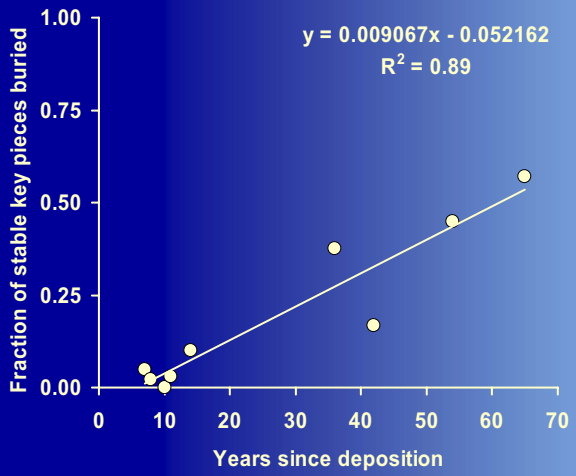

Wood is stockpiled in the floodplain
Wood abundance (m 3/ha)
250
200
150
100
50
0
Highly decayed
Moderately decayed
Partly decayed
Undecayed
Channel
5
10
20
30
40
60
>60
DBH of surrounding vegetation (cm)

Key pieces are quickly recaptured by the channel



50% loss……13 years
95% loss……..164 years

Burial of key pieces in the floodplain increases with time



100 logs in the channel

50 years later…

69 logs displaced

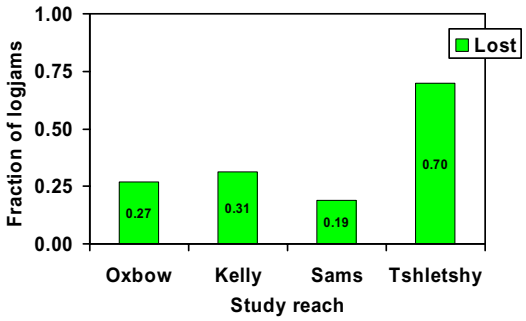
31 logs in the floodplain

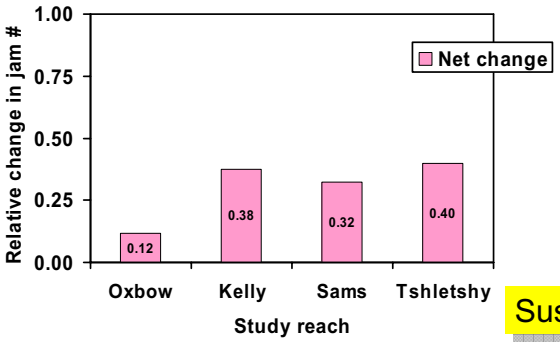
12 logs buried

19 logs on the floodplain surface

Jam turnover is rapid

19-70% of jams were lost during normal floods in a single year



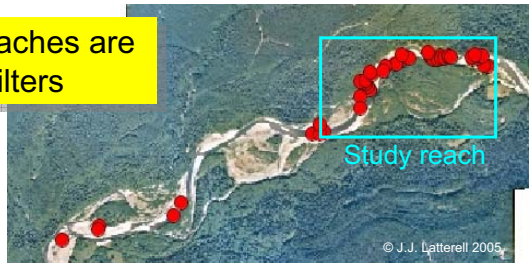


12-40% increase in jam abundance despite the loss of old jams

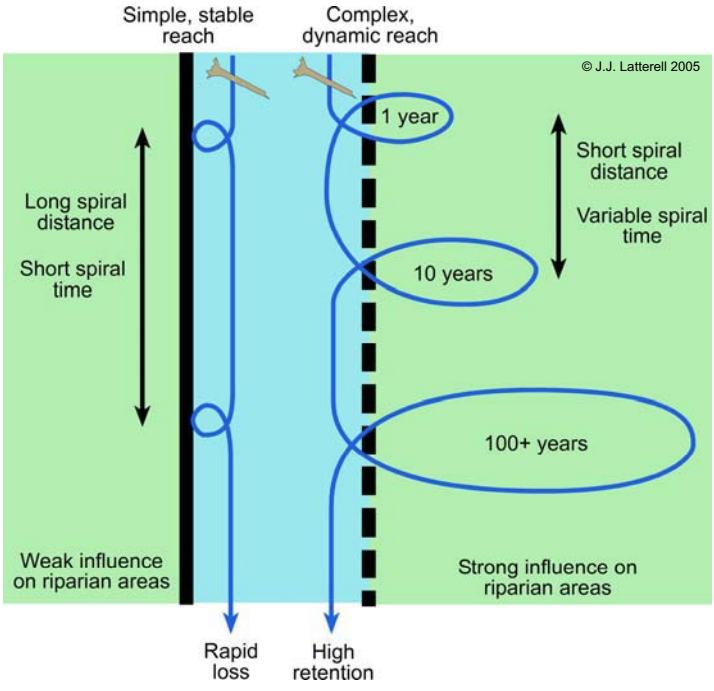
Sustained inputs are critical

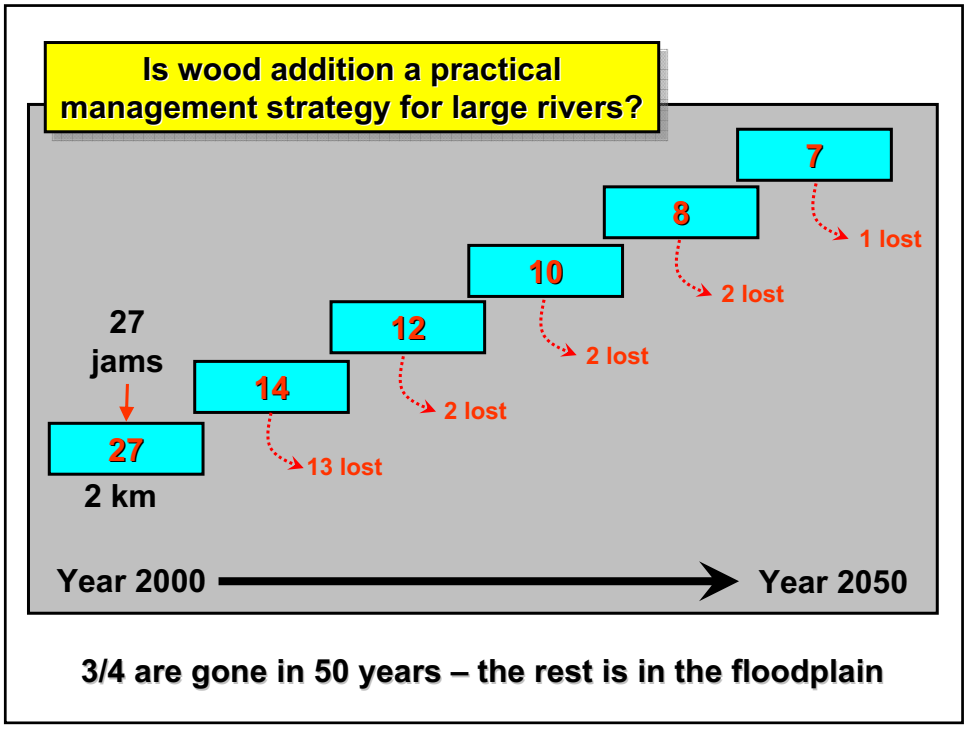
Simple, stable reaches are wood pipelines

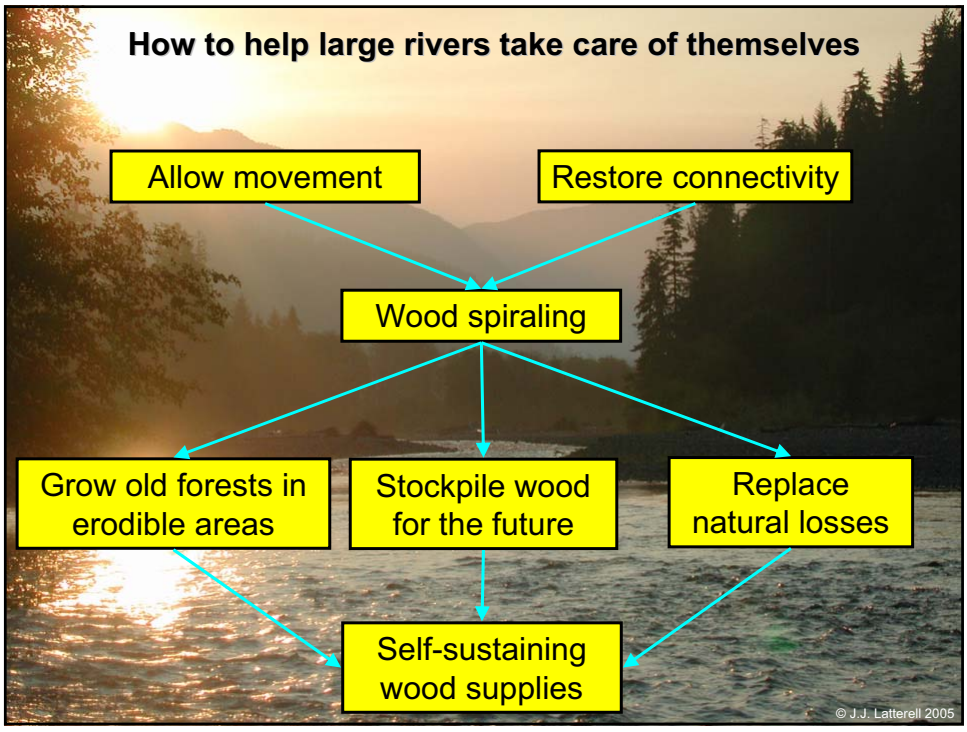
Complex reaches are wood filters



Wood Spiraling




Is wood addition a practical management strategy for large rivers?
27 jams
27
2 km
14
13 lost
12
2 lost
10
2 lost
8
2 lost
7
1 lost
Year 2000
Year 2050
3/4 are gone in 50 years – the rest is in the floodplain


How to help large rivers take care of themselves
Allow movement
Restore connectivity
Wood spiraling
Grow old forests in erodible areas
Stockpile wood for the future
Replace natural losses
Self-sustaining wood supplies
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