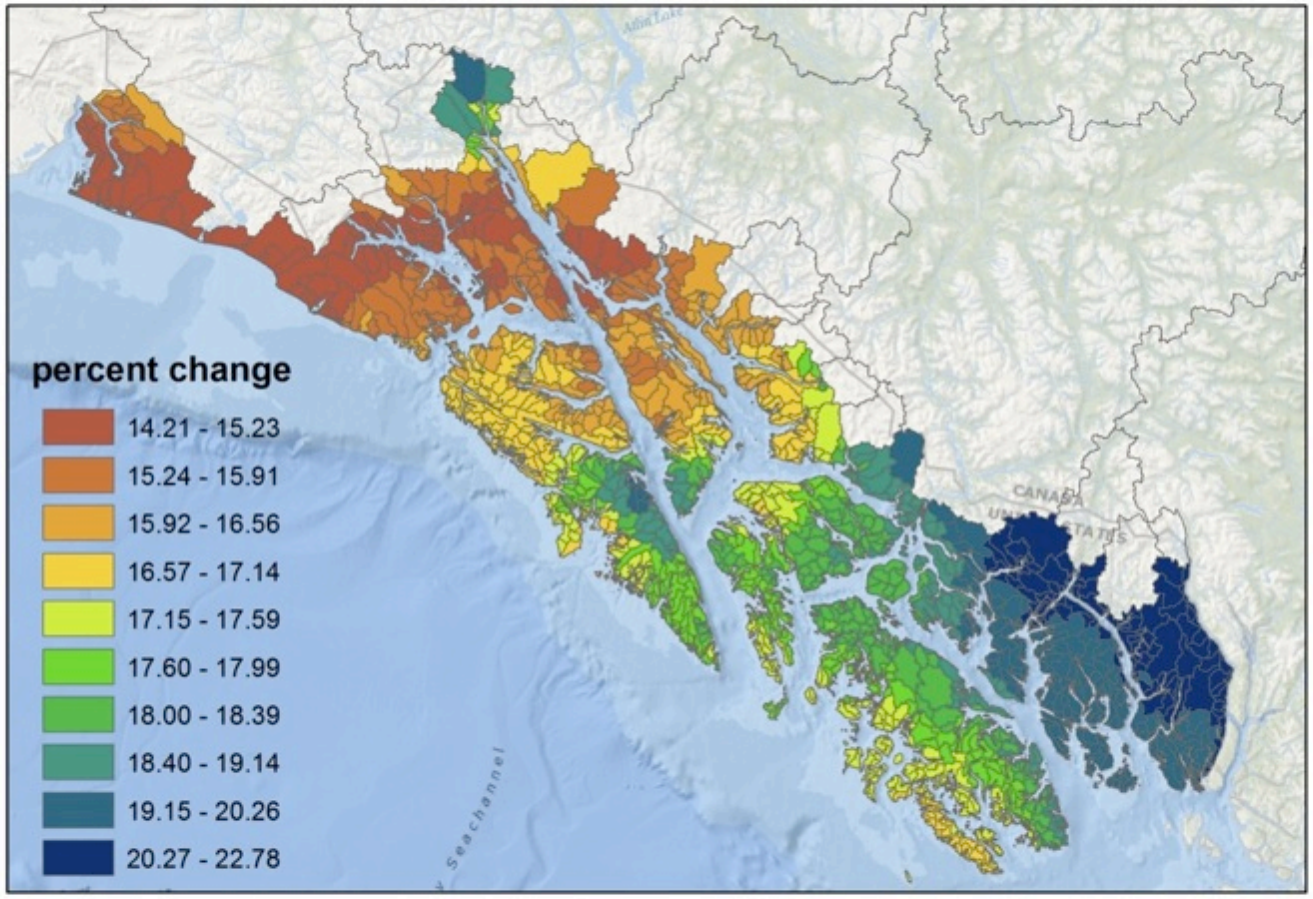
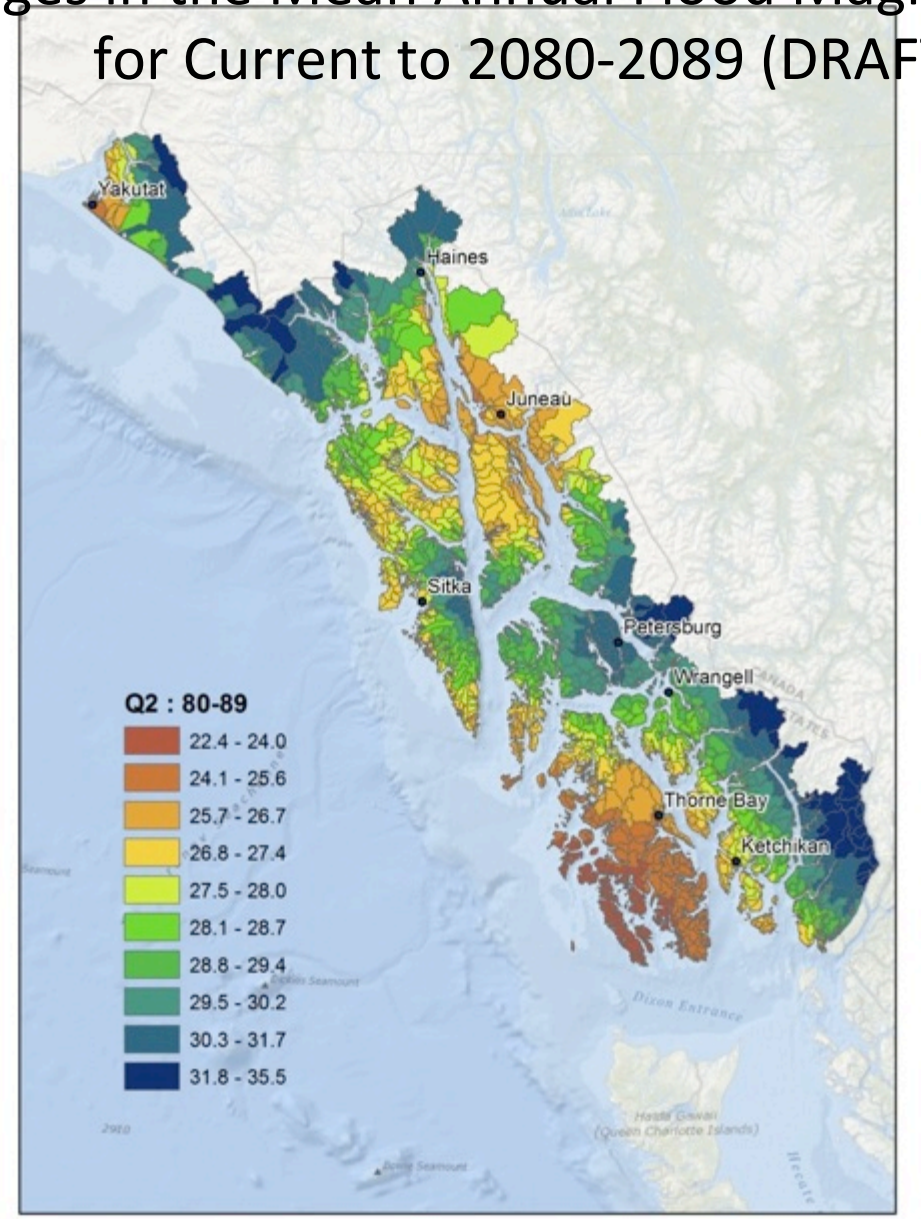
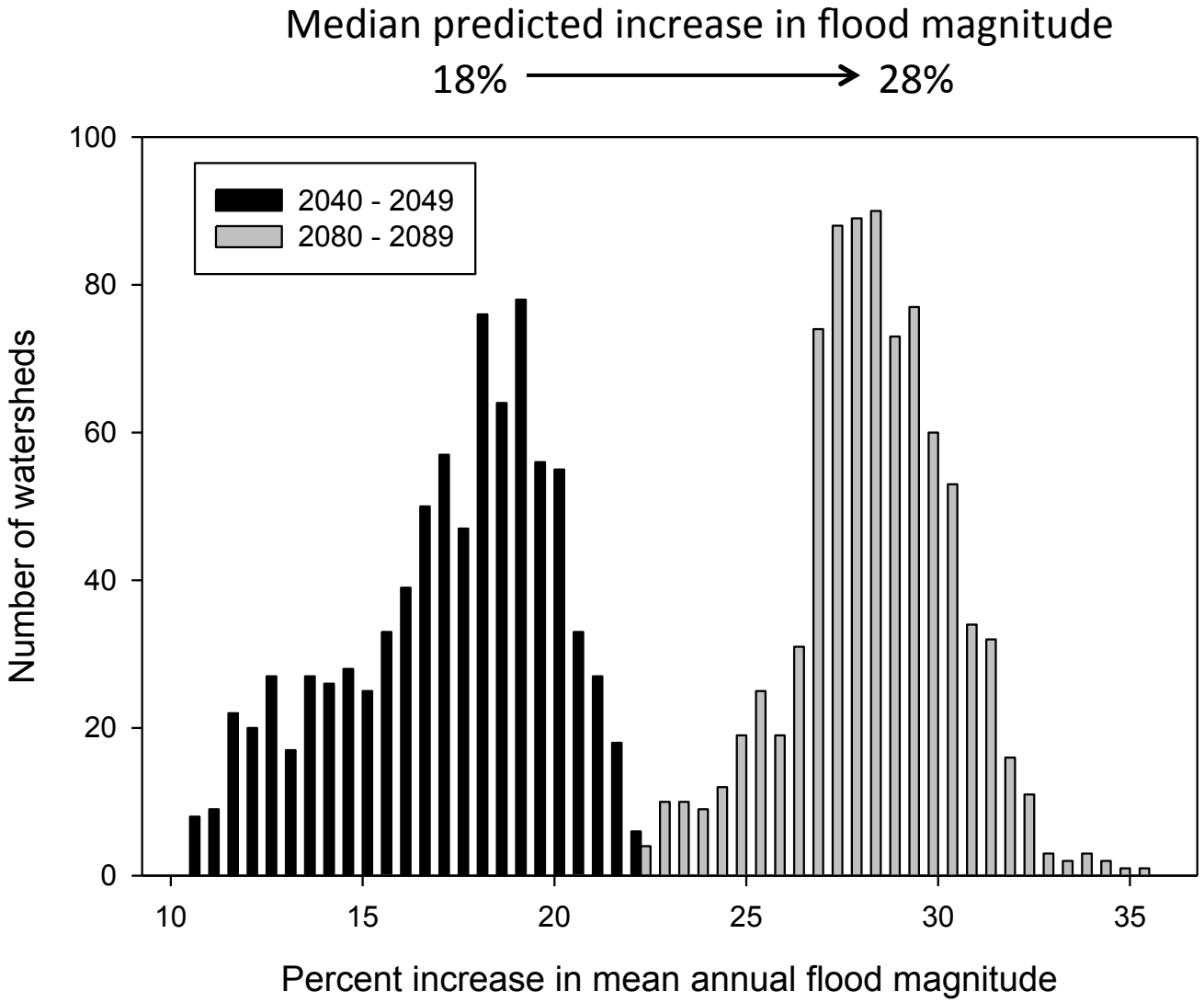
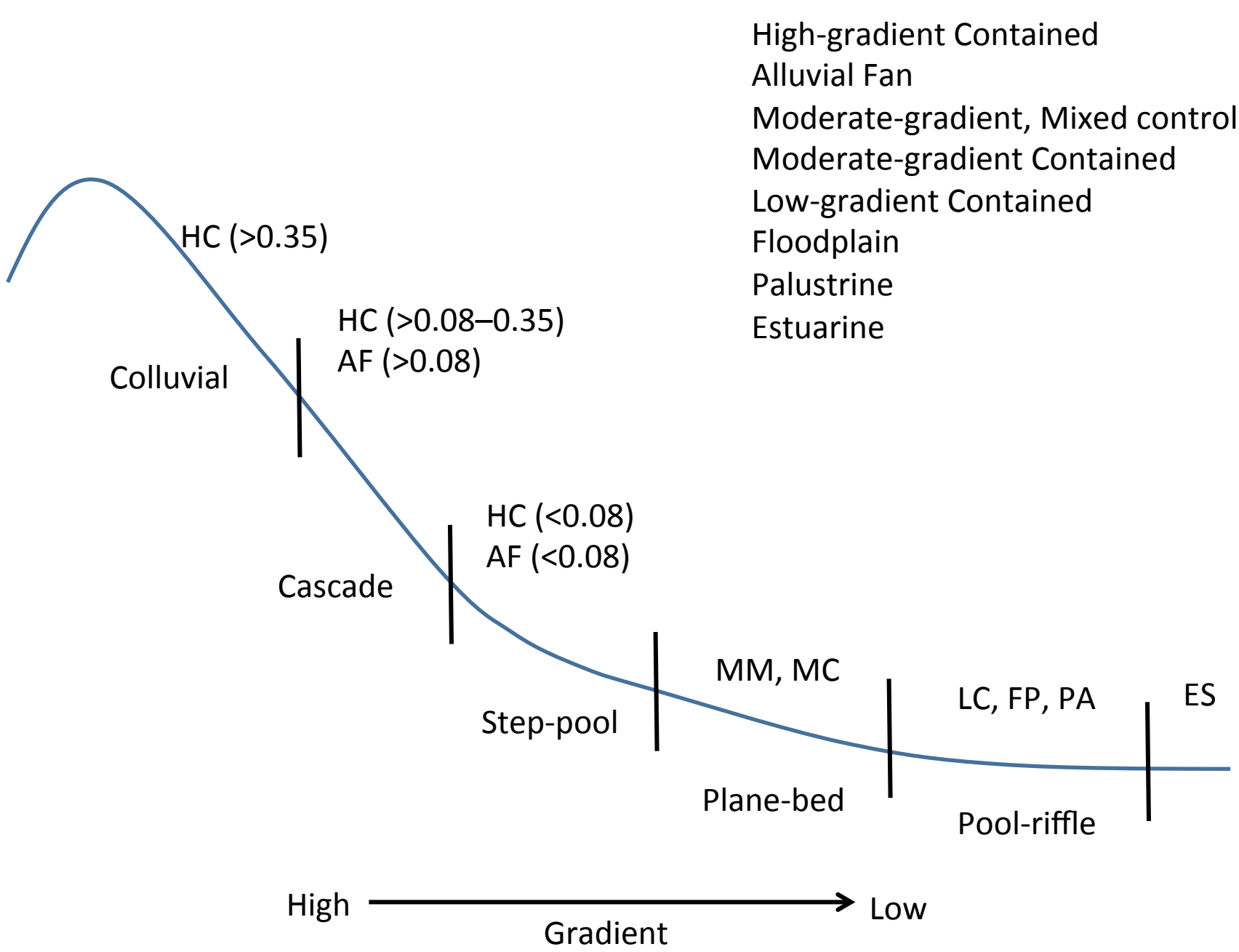
Precipitation change - current to 2080-89



Changes in the Mean Annual Flood Magnitude (Q_2) for Current to 2080-2089 (DRAFT)




Median predicted increase in flood magnitude
18%
28%
2040 - 2049
2080 - 2089
Number of watersheds
0
20
40
60
80
100
10
15
20
25
30
35
Percent increase in mean annual flood magnitude


High-gradient Contained
Alluvial Fan
Moderate-gradient, Mixed control
Moderate-gradient Contained
Low-gradient Contained
Floodplain
Palustrine
Estuarine
HC (>0.35)
HC (>0.08–0.35)
AF (>0.08)
Colluvial
HC (<0.08)
AF (<0.08)
Cascade
MM, MC
Step-pool
LC, FP, PA
ES
Plane-bed
Pool-riffle
High
Low
Gradient

Reach-level channel response potential to changes in sediment supply and discharge (modified from Montgomery and Buffington 1997)

	Width	Depth	Roughness	Scour depth	Grain size	Slope	Sediment storage
Pool riffle	+	+	+	+	+	+	+
Plane bed	p	+	p	+	+	+	p
Step pool	o	p	p	p	p	p	p
Cascade	o	o	p	o	p	o	o

Notes: +—likely, o—unlikely, p—possible.

Cascade

Step-pool

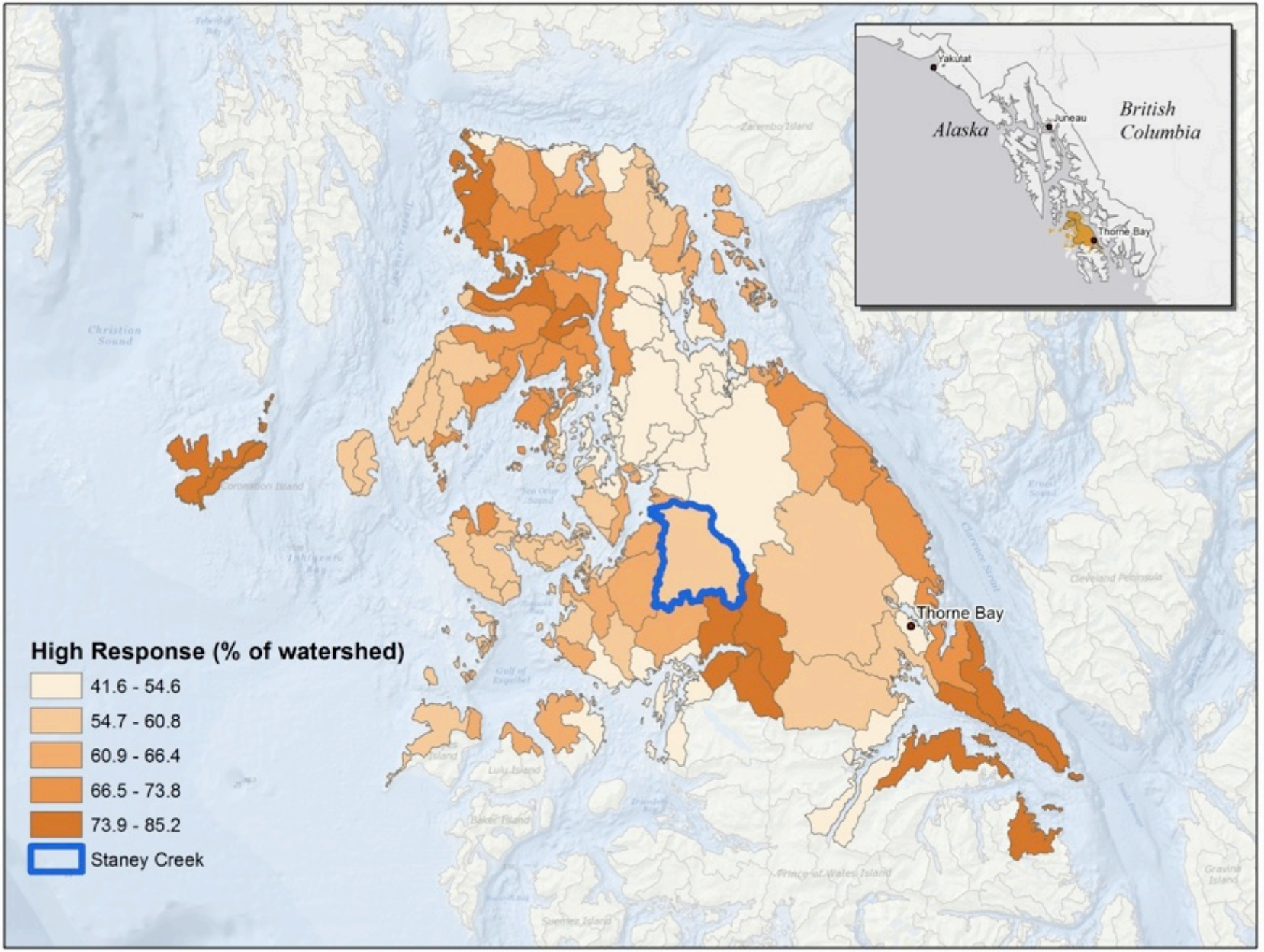
Plane-bed

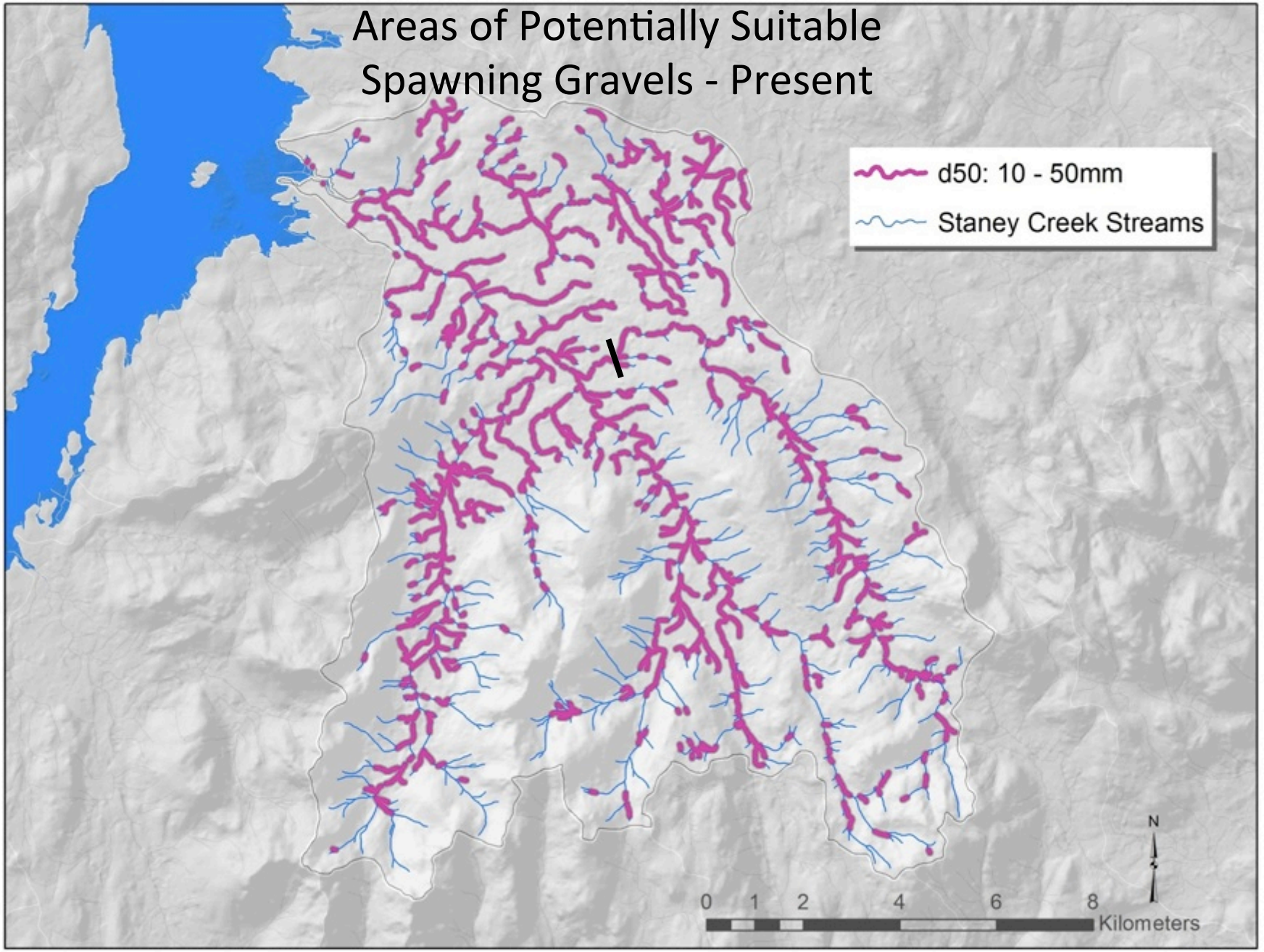
Pool-riffle

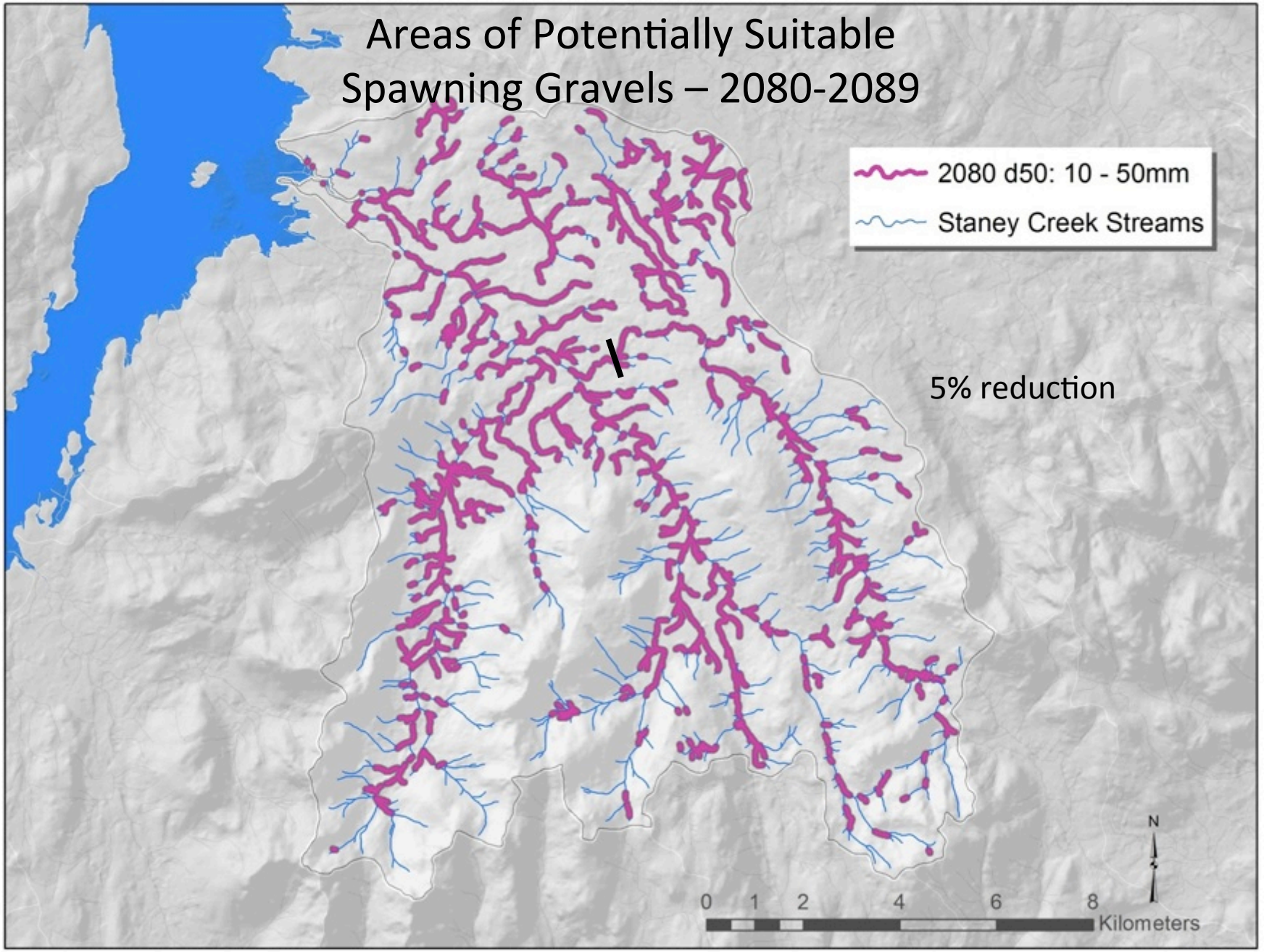
Transport → Response

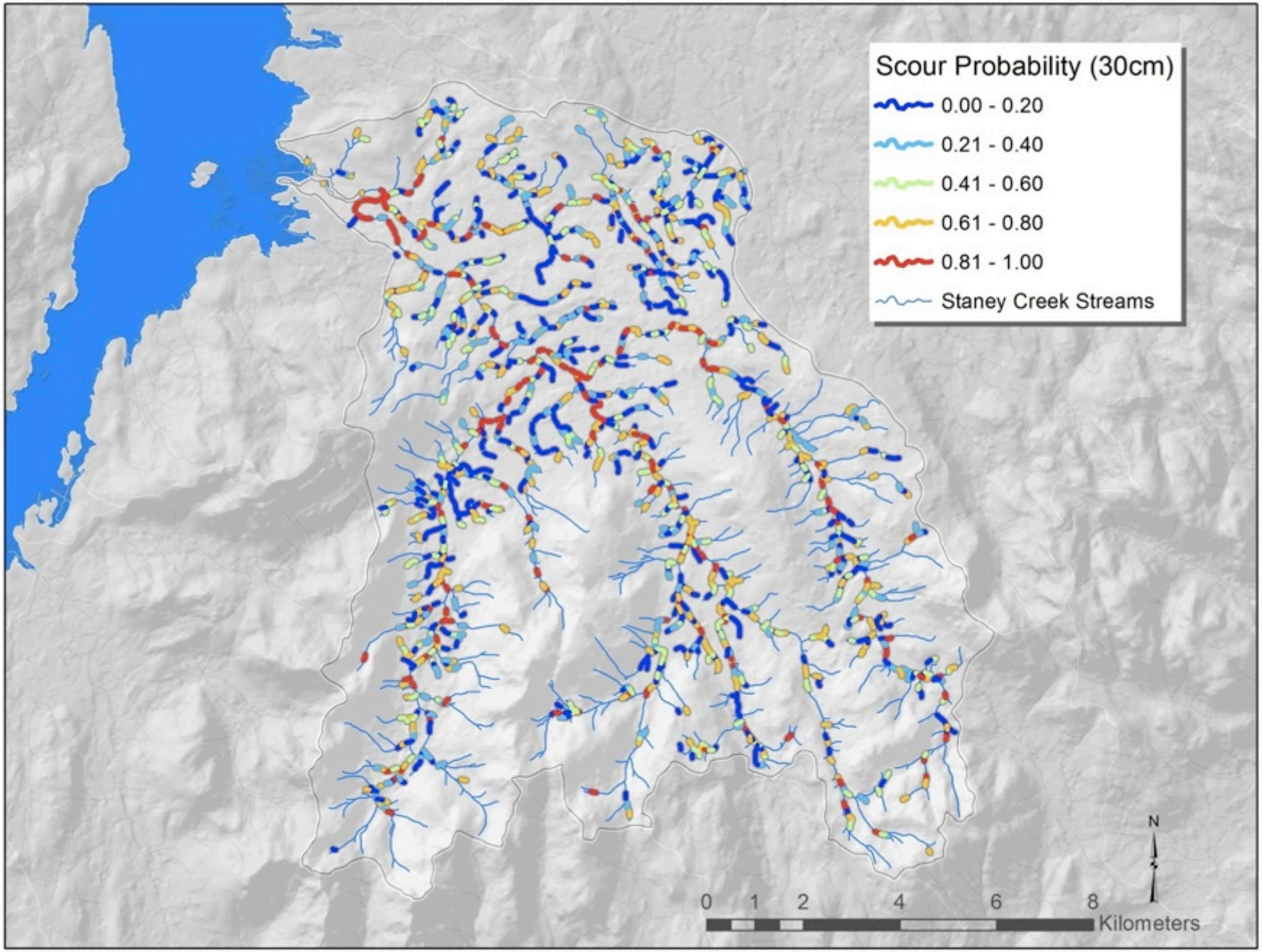
High → Low

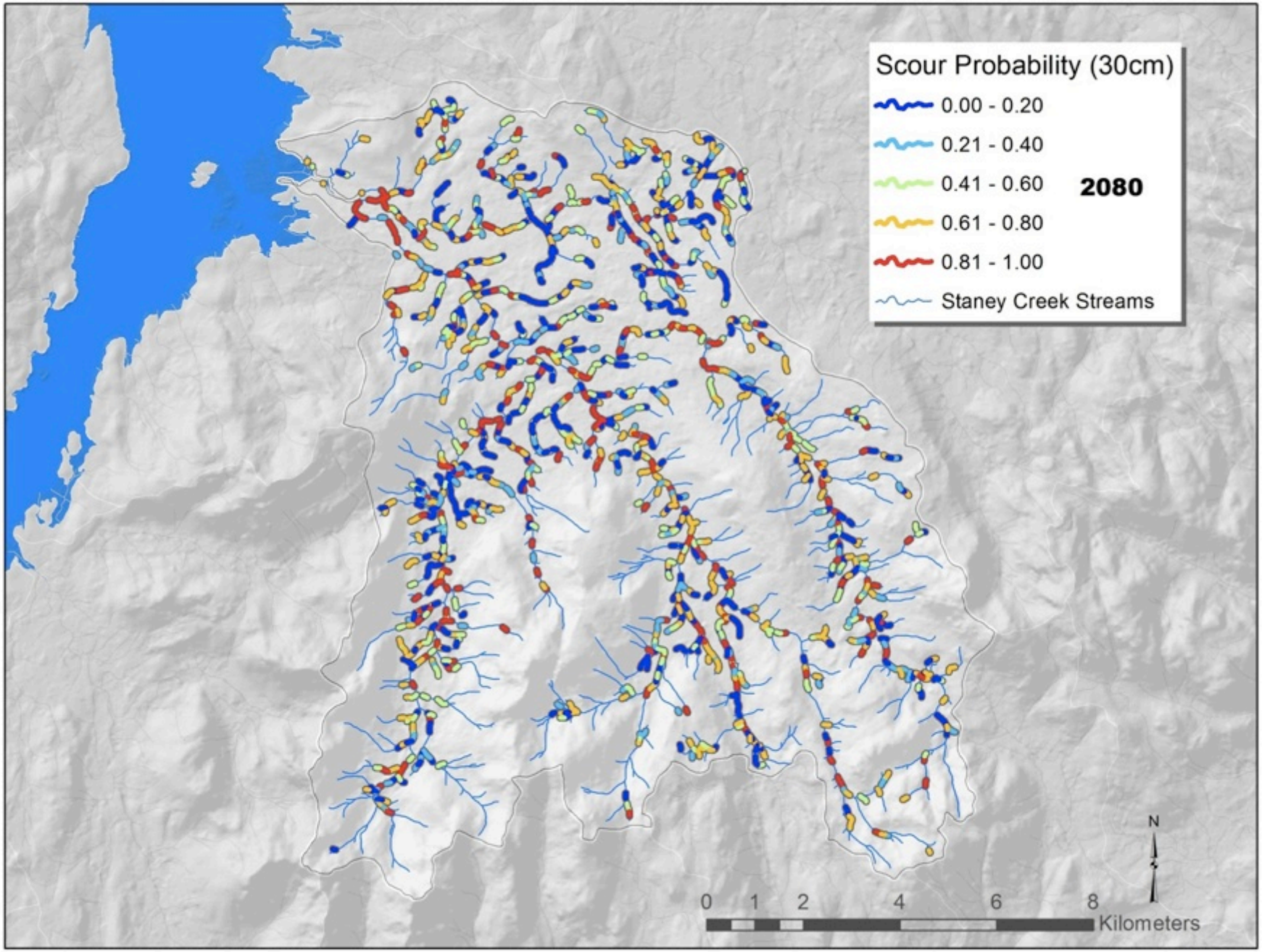
Gradient

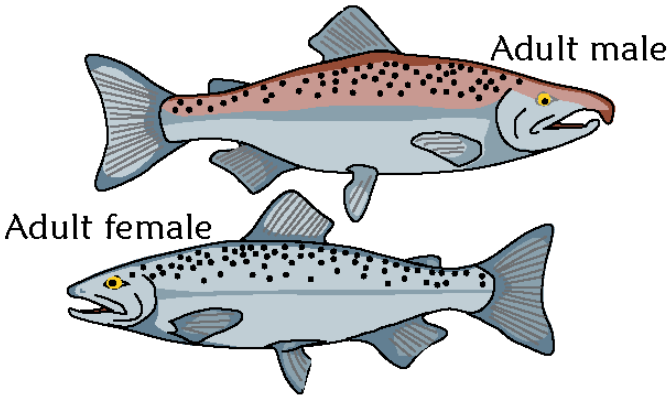

Yakutat
Alaska
Juneau
British Columbia
Thorne Bay
Thorne Bay
High Response (% of watershed)
41.6 - 54.6
54.7 - 60.8
60.9 - 66.4
66.5 - 73.8
73.9 - 85.2
Staney Creek


Areas of Potentially Suitable Spawning Gravels - Present
d50: 10 - 50mm
Staney Creek Streams
N
0 1 2 4 6 8
Kilometers


Areas of Potentially Suitable Spawning Gravels – 2080-2089
2080 d50: 10 - 50mm
Staney Creek Streams
5% reduction
N
0 1 2 4 6 8
Kilometers


Scour Probability (30cm)
0.00 - 0.20
0.21 - 0.40
0.41 - 0.60
0.61 - 0.80
0.81 - 1.00
Staney Creek Streams
N
0 1 2 4 6 8
Kilometers


Scour Probability (30cm)
0.00 - 0.20
0.21 - 0.40
0.41 - 0.60
0.61 - 0.80
0.81 - 1.00
Staney Creek Streams
2080
N
0 1 2 4 6 8
Kilometers

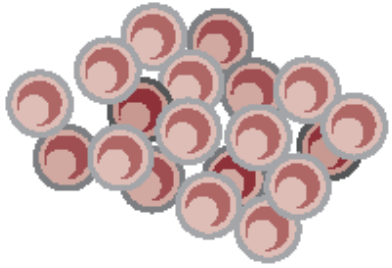


Adults: Ocean

- Water temp ⬆
- Upwelling timing ▲
- pH ▲

⇒

- Decreased food supplies
- Decreased growth and survival in marine environment
  - smolts
  - adults

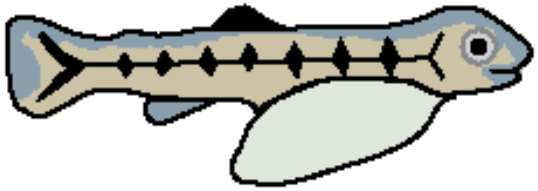


Eggs & Developing Embryos

- Water temp ↑
- Flows ↑

⇒

- Increased rate of development
- Increased susceptibility to scour
  - may be confounded by reduced size of adults



Fry

- Water temp ↑
- Flows ↑

- Positive effects
  - early emergence
  - increased habitat availability
- Negative effects
  - displacement
  - altered time of ocean entry

Vulnerability to Potential Climate Change Effects