

Natural Resource Use In Clayoquot and Barkley Sounds

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Introduction

Natural resource use has been shown to affect a watershed's ecosystem (Cooper *et al* 1987, Osborn and Kovacic 1993). Increased nutrient loads, carried by surface runoff, have been shown to contribute to hypoxic or anoxic conditions in the receiving waterbody (Boesch *et al* 2001). This nutrient enrichment is considered to be a leading cause of degraded water quality in coastal waters (Howarth 2004). Clayoquot and Barkley Sounds (Figure 1) were chosen for this watershed analysis due to additional ongoing water quality research being conducted in the region.



Figure 1: Clayoquot and Barkley Sounds, Vancouver Island, British Columbia, Canada

Methods

ArcGIS was used in a three-part process to analyze natural resource use:

- 1) Watersheds were created from Canadian digital elevation data.
- 2) Natural resource across the watersheds were normalized and z-scores computed:
 - 1) Lack of intact forest land (Figure 3)
 - 2) Mineral mine claims (Figure 4)
 - 3) Coal mine claims
 - 4) Saltwater finfish farms
 - 5) Freshwater hatcheries and finfish farms
 - 6) Shellfish farms
- 3) Z-scored rasters were then added to determine an impact ranking determined (Figure 2)
 - 1) Lack of intact forest land
 - 2) Mineral mining

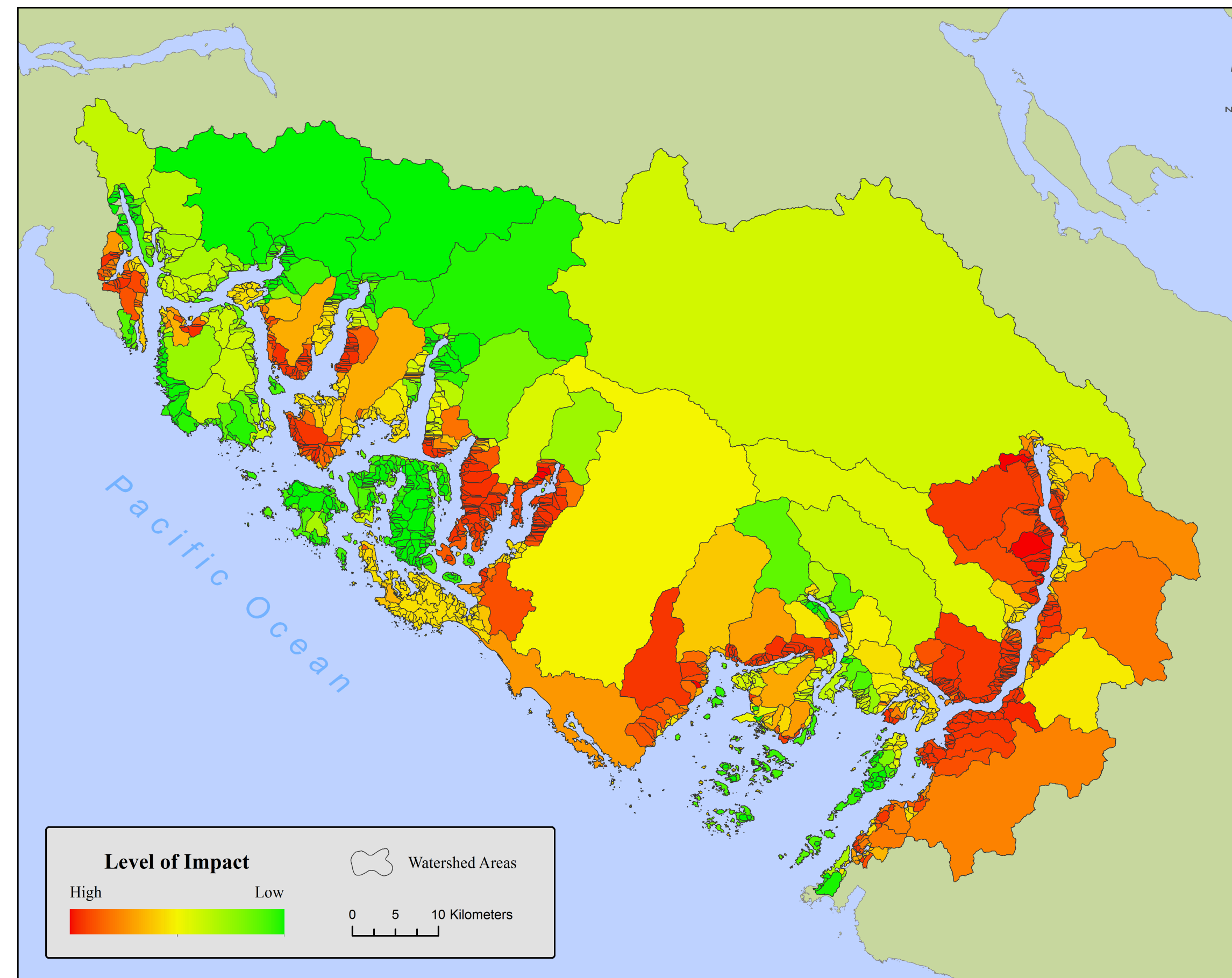


Figure 2: The impact of natural resource use in Clayoquot and Barkley Sounds

Results

- Clayoquot Sound had more intact forest land than Barkley Sound (Figure 3).
- Mineral mining was concentrated in areas along the sounds and along Alberni Inlet (Figure 4).
- Coal mining was non-existent in the area.
- Freshwater aquaculture was only present in one watershed at the terminal end of Alberni Inlet.
- Saltwater aquaculture, both fin- and shellfish, generally did not occur within 0.5 km of the water quality research being conducted.
- Generally, Clayoquot Sound had less impact from natural resource use than Barkley Sound (Figure 2).

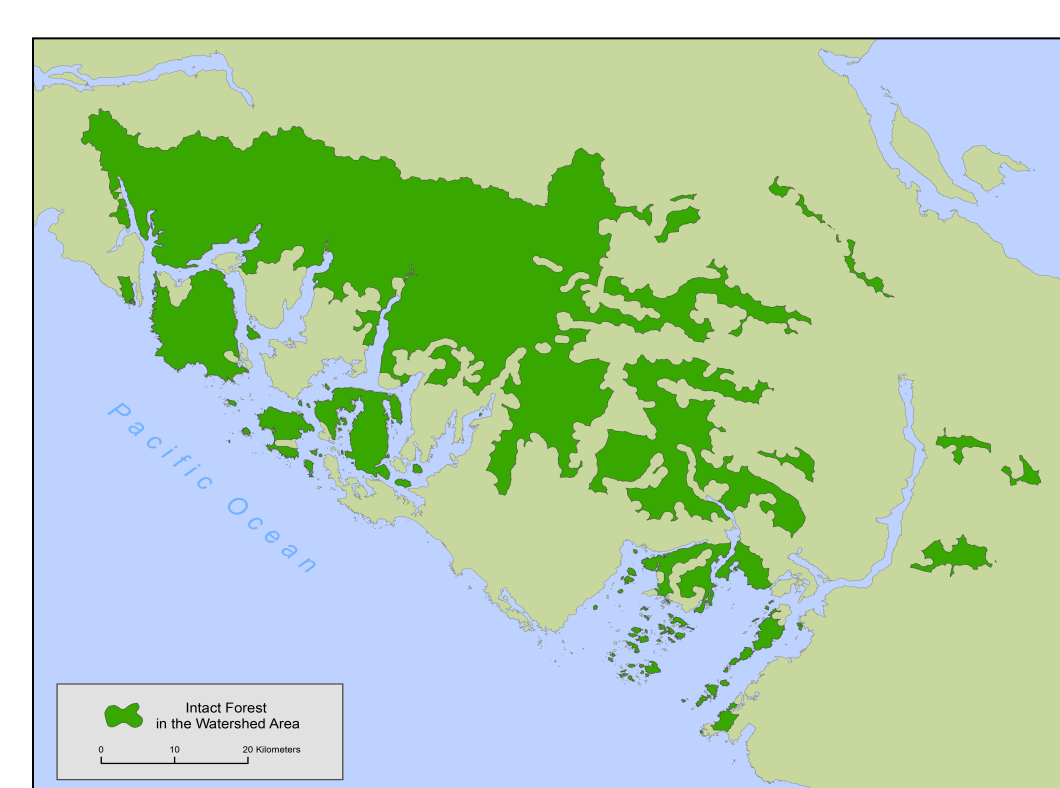


Figure 3: Intact forest land in Clayoquot and Barkley Sounds.

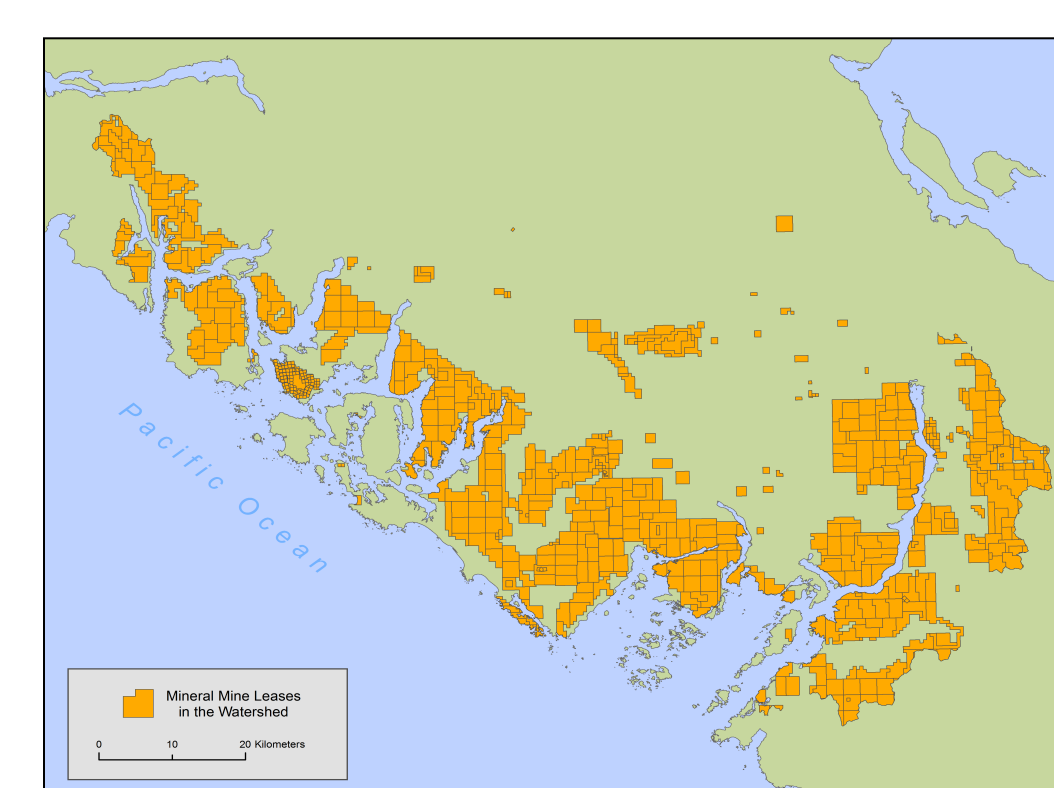


Figure 4: Mineral mining claims in Clayoquot and Barkley Sounds.

Discussion

Land use and development protests in the 1980s and early 1990s, lead to policies severely limiting logging in Clayoquot Sound. In January 2000, Clayoquot Sound was designated as a UNESCO Biosphere Reserve.

Future research would be wise to include participatory GIS data including:

- the perceive the quality of the watersheds
- the perceived effectiveness protests in the 1980s and early 1990s.



Figure 5: Protesters in Clayoquot Sound.

Data Sources

Data BC -- <http://www.data.gov.bc.ca/>
GeoBase -- <http://www.geobase.ca/>
Global Forest Watch Canada
<http://datawarehouse.globalforestwatch.ca/>

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References

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