

# SHORT HISTORY OF SALMONID AQUACULTURE



- *“It is important to know where you have been and where you are, if you want to know where you are going”*

- Salmonid aquaculture has its roots in general aquaculture.
- Without basic developments in aquaculture salmonid aquaculture would not have been possible.

- Zhou Dynasty in China dating from 2300 BC was the first known work published on aquaculture.
- Fan Li published a monograph detailing design and layout of ponds and the propagation of fry and fingerlings



- The integration of fish with aquatic plants and vegetable production and the development of cage culture was described as early as 2000 BC by You Hou Bin.

- Fast forward 1500 years to 500BC
- Romans developed a system of” *Vallicoultura*” (lagoon fish breeding)

Fish husbandry techniques were developed to rear fish in ocean impoundments.



- Fast forward another 1500 years
- Year 1000
- Leif Ericson arrives in Newfoundland
- Charlemagne is ruling in Europe
- Pond culture is flourishing – wealth and religion.
- Aquaculture regulations are introduced for the maintenance and management of ponds, to prevent poaching and the sale of fish is regulated





1400 to 1600

Period of great economic growth in Europe and a flourishing of the arts

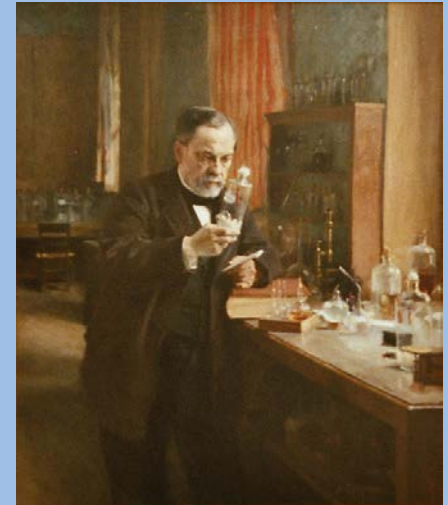
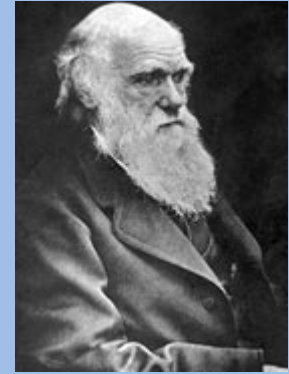
Fish culture grew rapidly and was widespread.

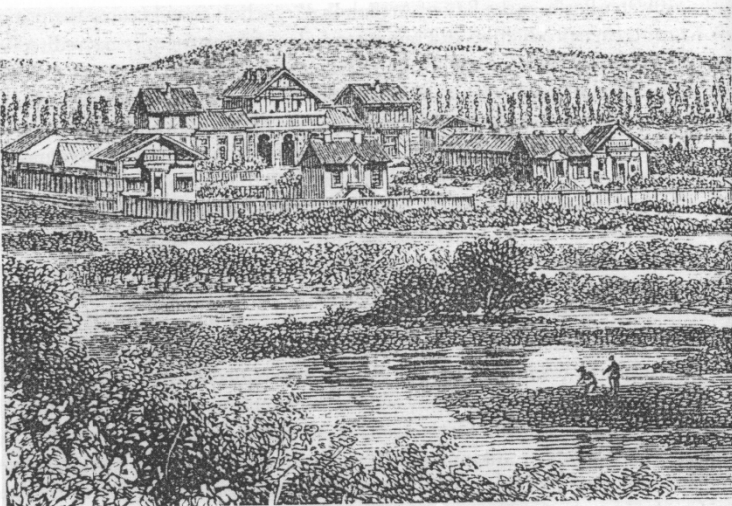




- 1600 to 1800
- Dark ages for aquaculture
- Agriculture was favoured
- Many fish ponds were drained and replaced by agriculture production

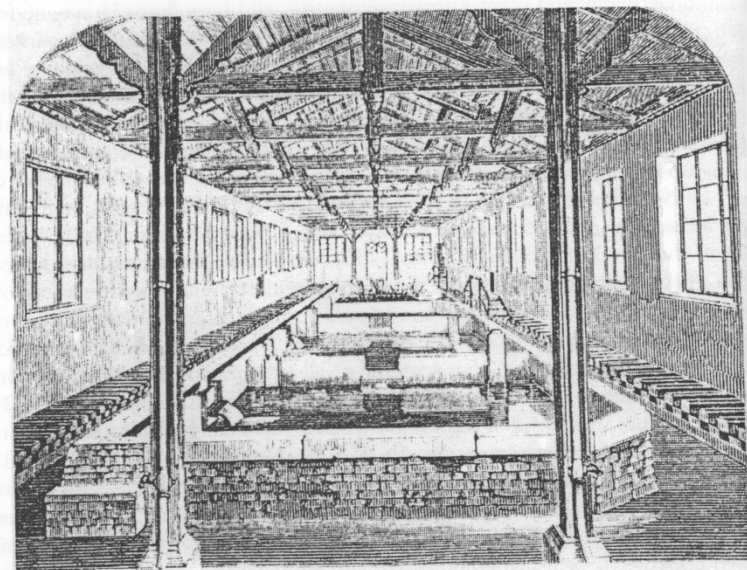
- 1800 to 1900
- This was the golden age of biology
- Charles Darwin
- Louis Pasteur
- Gregor Mendel
- The beginning of modern salmonid aquaculture.





*View of the Huningue Establishment*

(a)



*Basins for the young fish*

(b)

# Huningue Hatchery (France)

Salmon

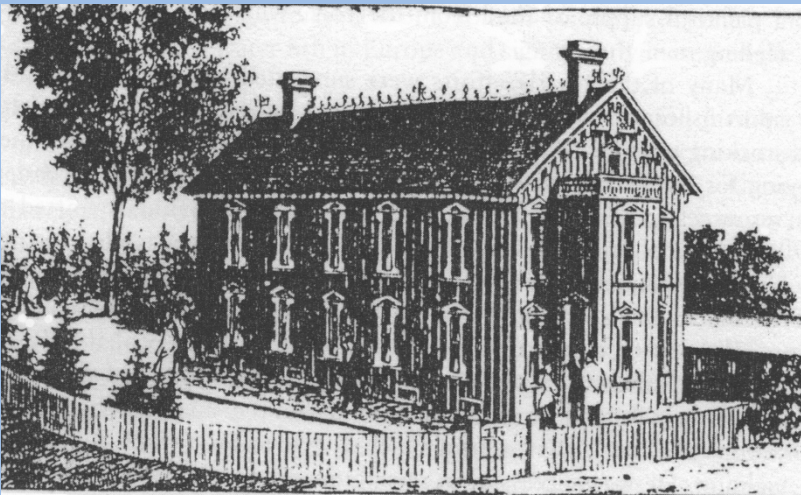
Trout

Char

Sturgeon

**Figure 5.2** France, 1862; Huningue Hatchery Station; etchings of (a) the Huningue Hatchery Station; (b) tank room for young fish in the interior; (Continued)

- Canada established hatcheries in Quebec, New Brunswick and Ontario in the mid 1800's
- The first hatchery in BC for Pacific salmon was established at Harrison in 1884



By 1900 Washington state releasing 58,000,000 fry

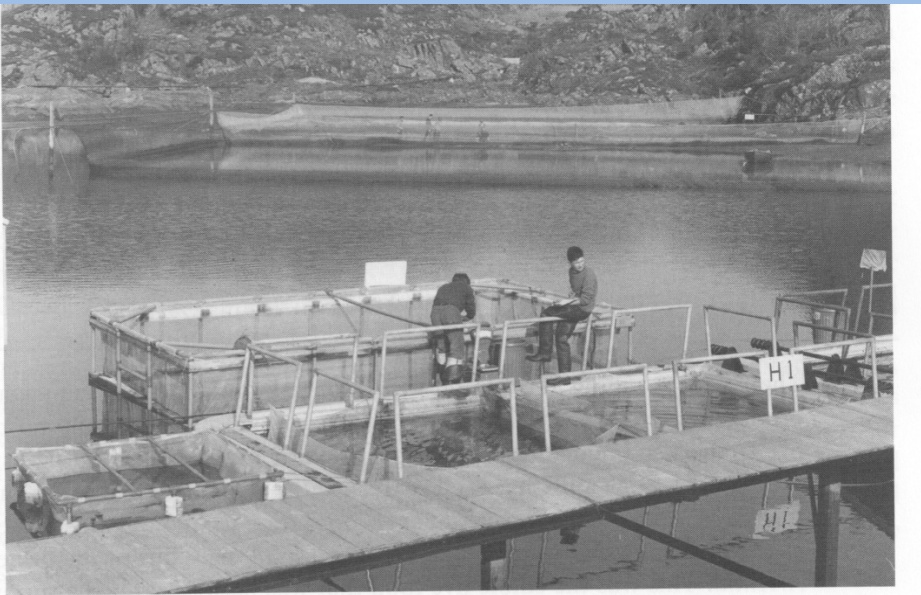
- Salmon aquaculture remained about status quo until the 1950's/60's
- On the west coast it branched into two distinct types of production – salmon ranching and cage culture
- In Canada all of the ranching activities were public
- In the US ranching activities were both public and private.

- Private salmon ranching in the US was financed by several large us firm
  - Union Carbide
  - Weyerhaeuser
  - Campbell Soup
- 
- This was not a profitable venture because there was no control over who harvested the fish.

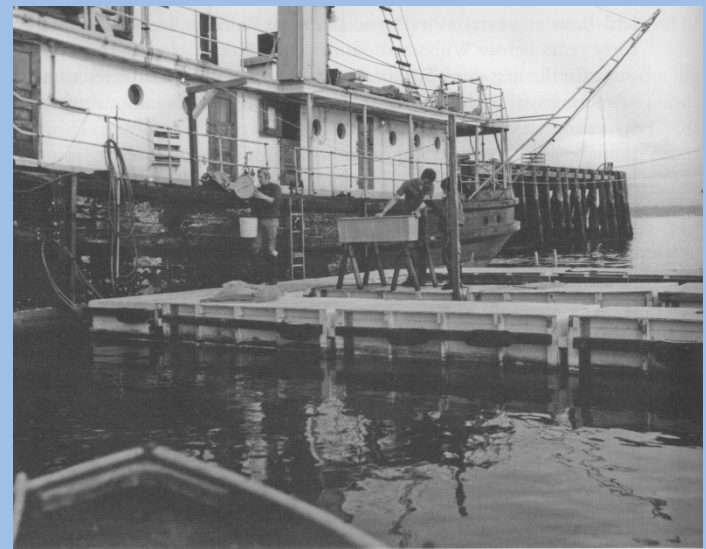
- Public salmon ranching was very popular in the Pacific from California to Alaska.
- There was great expansion of salmon hatcheries and the ranching of salmon throughout the 70's and early 80's
- Salmon ranching remains the dominant form of aquaculture on west coast of North America.



- During the late 60's throughout the 70's there was a lot of experimentation with cage culture

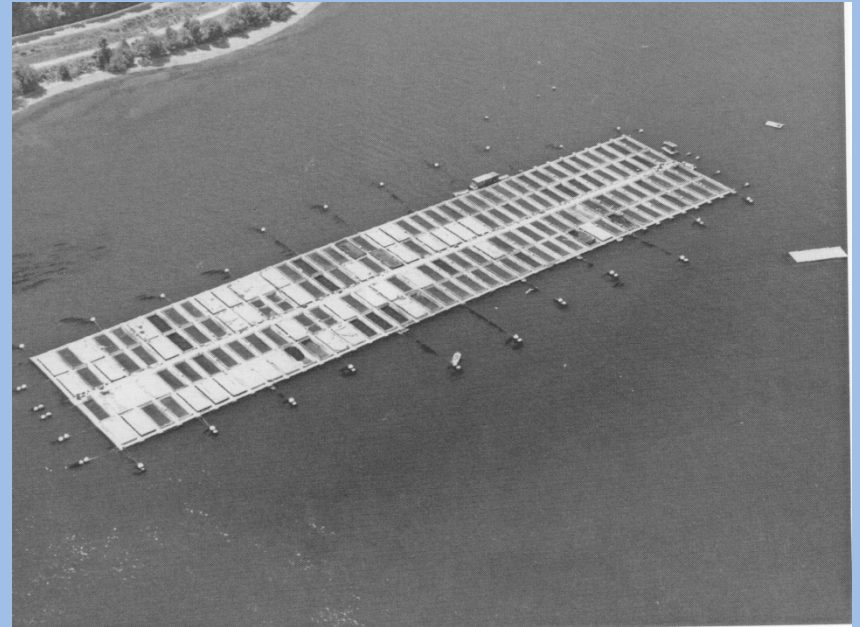


**Figure 9.4** Scotland, 1966; experimental flatfish farm site built by the White Fish Authority at Ardtoe.



**Figure 9.6** United States, 1971; floating hatchery, MV Brown Bear (at Manchester pier for Pacific and Atlantic salmon).

- In the 70's NOAA/NMFS in the US experimented with growing fish in cages to produce fish for market rather than for ranching.



# Port Alberni Marine Farms

The same technology was tried in BC in the  
Alberni Canal raising Coho

It did not work



- Modern Era
- About 1985
- Tom May and Brad hope were successfully raising small quantities of Coho and Chinook at Hotham Sound and Hidden Basin on Nelson Island.
- Prices for salmon were very good and they were able to make a profit





**Pioneering fish farmers hard at work**  
Ralph Shaw and Gus Angus

- By 1986/1987 several farms were established on the Sunshine coast



- Wood was good.





Many of the earliest farms were family operations



Doctor Bay Rob Smeal and his mom Mavis

NORTH COAST

MID COAST

NORTH VANCOUVER ISLAND

SUNSHINE COAST

WEST VANCOUVER ISLAND

VANCOUVER

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Image USDA Farm Service Agency  
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51°01'20.82" N 124°45'22.95" W elev 3760 ft

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Eye alt: 996.79 m

258 mi



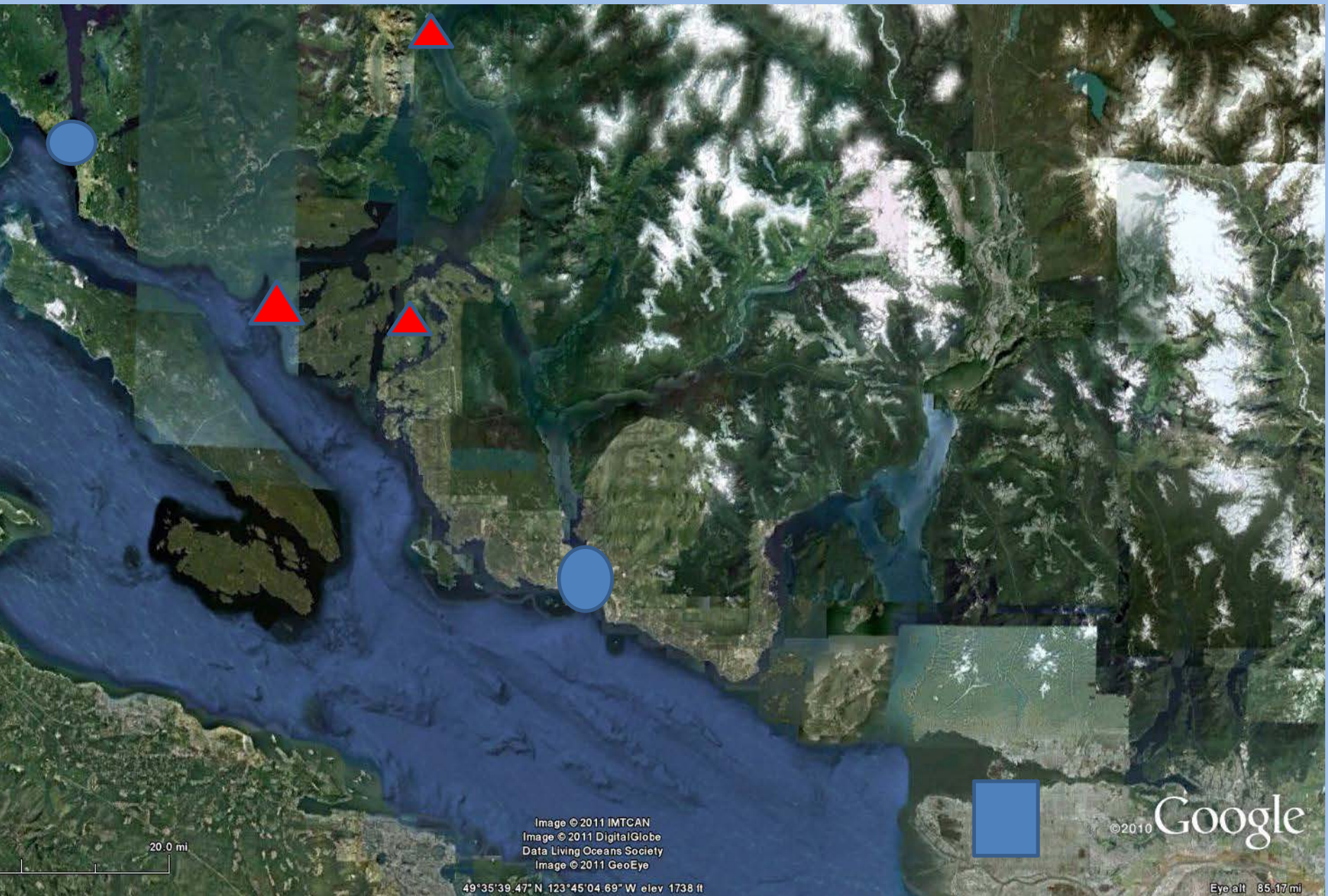


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49°35'39.47" N 123°45'04.69" W elev 1738 ft

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# First Growth Phase (1985 to 1989)

- In 1986 BC was finally coming out of the 1983 recession and was very anxious to get people back to work.
- The rest of Canada and the world has largely recovered from the recession a couple of years earlier and there was a lot of money in the markets
- Salmon farming was proving to be successful in Norway, Scotland and New Brunswick

# The Perfect Storm

- The BC government of the day had global promotions for investors to come to BC and invest in Mining, Forestry and Aquaculture
- The Norwegian government has an export development arm interested in exporting Norwegian technology around the Globe
- The Norwegian banks were full of money from the North Sea oil
- The Norwegian banks had a presence in Seattle.

# The Perfect Storm

- By 1988 everything was in place
- The Canadian and BC economies were very strong
- The BC government was open for business
- The price of salmon was the highest it had ever been
- Salmon farming was a profitable business
- BC has a great environment for salmon farming
- BC had lots of expertise in raising Pacific salmon

# The Perfect Storm

- Within about 4 years about 127 farm sites were leased to the industry.
- Salmon farms were established on the Sunshine coast and Gulf Islands
- Followed by farms being placed in the Alberni Canal and Tofino Inlet



# Bursting of the Bubble

- Pacific salmon did not farm well
- Natural occurring algal blooms killed millions of salmon on the Sunshine coast
- The production of farmed salmon grew very rapidly causing the price to fall sharply
- A lot of the easy money was badly spent
- 1990 the salmon mountain
- 1992 a recession



# Picking up the Pieces

- There were several bankruptcies resulting in a lot of consolidations
- The industry went from over 100 companies to about 20.
- The investment capital had dried up and companies were relying on cash generated from sales but the price of salmon was continuing to fall
- Very dark days



# POLITICS

- BC elected an NDP government
- This lead to an almost immediate administrative moratorium
- There was environmental review (SAR)
- Stagnation occurred



# FEAR OF FOOD

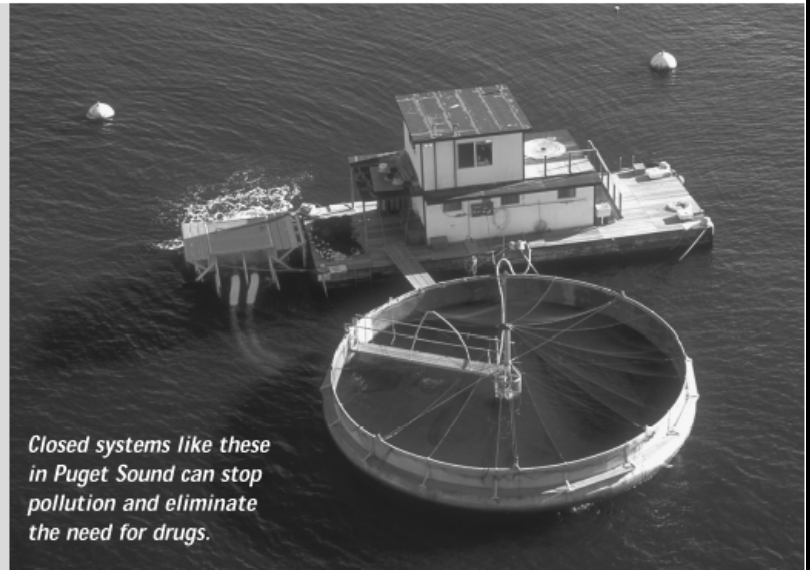
[HUMAN HEALTH AND THE SURVIVAL OF B.C.'S WILD SALMON ARE AT STAKE]



## Is Your Fish Dinner Laced with Drugs?

### *Netcage Salmon Farms Can Infect B.C.*

*Powerful antibiotics are routinely used to battle disease outbreaks in open netcage fish farms — the same drugs used to treat human infections. But dumping these drugs into open cages speeds the growth of drug-resistant microbes that can't be treated. Humans can "pick up antibiotic-resistant bacteria by eating farmed salmon," says University of B.C. microbiologist Dr. Julian Davies.*



*Closed systems like these in Puget Sound can stop pollution and eliminate the need for drugs.*

**NOT EVERYONE  
LIKES THE IDEA  
OF FISH FARMING**

# Outside of BC

- Salmon farming continued growing outside BC
- By 1998 there was as much salmon being grown by farmer as caught fishermen and the value of farmed salmon represented about 85% of the value of the global salmon crop
- Salmon farming companies outside BC were growing and getting stronger
- BC companies were stagnating and getting weaker
- The regulatory burden for BC companies was growing and the cost of doing business in BC was escalating rapidly
- It was no longer possible to raise money to salmon farm in BC

# Outside of BC

- BC companies worked at expansion by investing outside of BC –primarily Chile
- Salmon prices recovered in the mid to late nineties and the companies which where able to expand locally became financially strong
- Norway was the most successful farming region during this time so they became the strongest

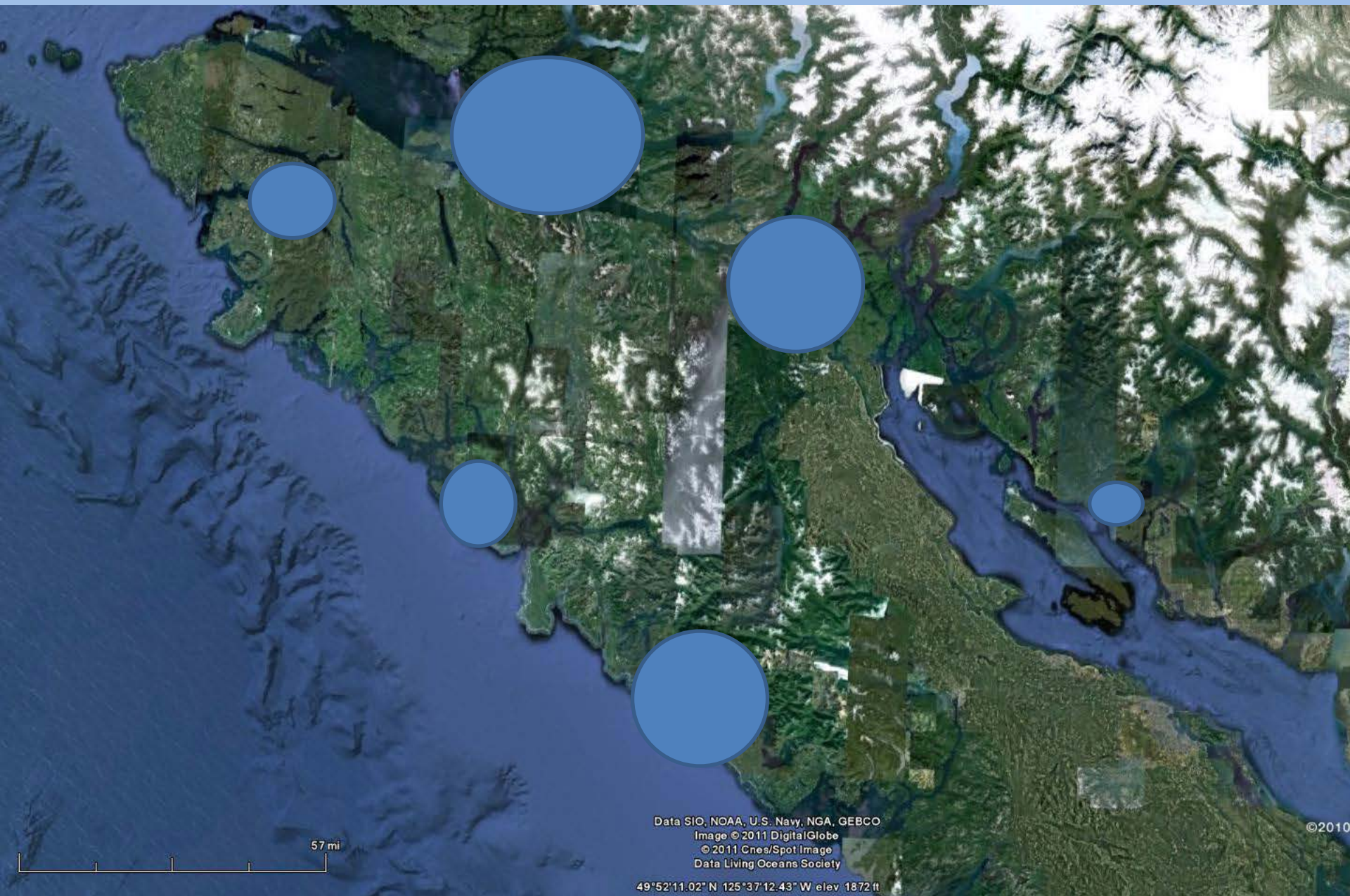
# The Big Consolidation

- The price of salmon fell again around 2000.
- This meant that the weaker companies were good takeover targets for the stronger companies
- Within about 5 years the medium sized companies in BC had been consolidated into the current Three larger companies
- Marine Harvest, Mainstream and Greig



# The Big Fish Eat the Little Fish





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49°52'11.02" N 125°37'12.43" W elev 1872 ft

# Fish in a SILO

- Hagensberg land-based aquaculture site in Nanaimo was the first large scale attempt to raise salmon in a “closed containment” system in BC.
- It failed for several reason – too expensive-  
too many system failures

# Fish in a BAG

- Future sea systems
- These were systems that deployed a large bag in the ocean and pumped in sea water
- These systems were tried in a variety of setting for about 10 years but in the end were not successful – largely because of material failure and high cost of production



# Fish in a Bag





# Closed Containment (RAS)

- Also began in the 60s and 70s
- Lots of different systems tried lots of failures
- By 1995 some successful systems were beginning to emerge
- These systems worked for high value crops (eels, tilapia, salmon smolts)
- First systems were placed in BC about this time

# Closed Containment (RAS)

- Continual improvement of RAS
- Embarking on the commercialization of RAS for salmon
- Money
- Patience
- Luck

# Proud to be a Salmon Farmer

