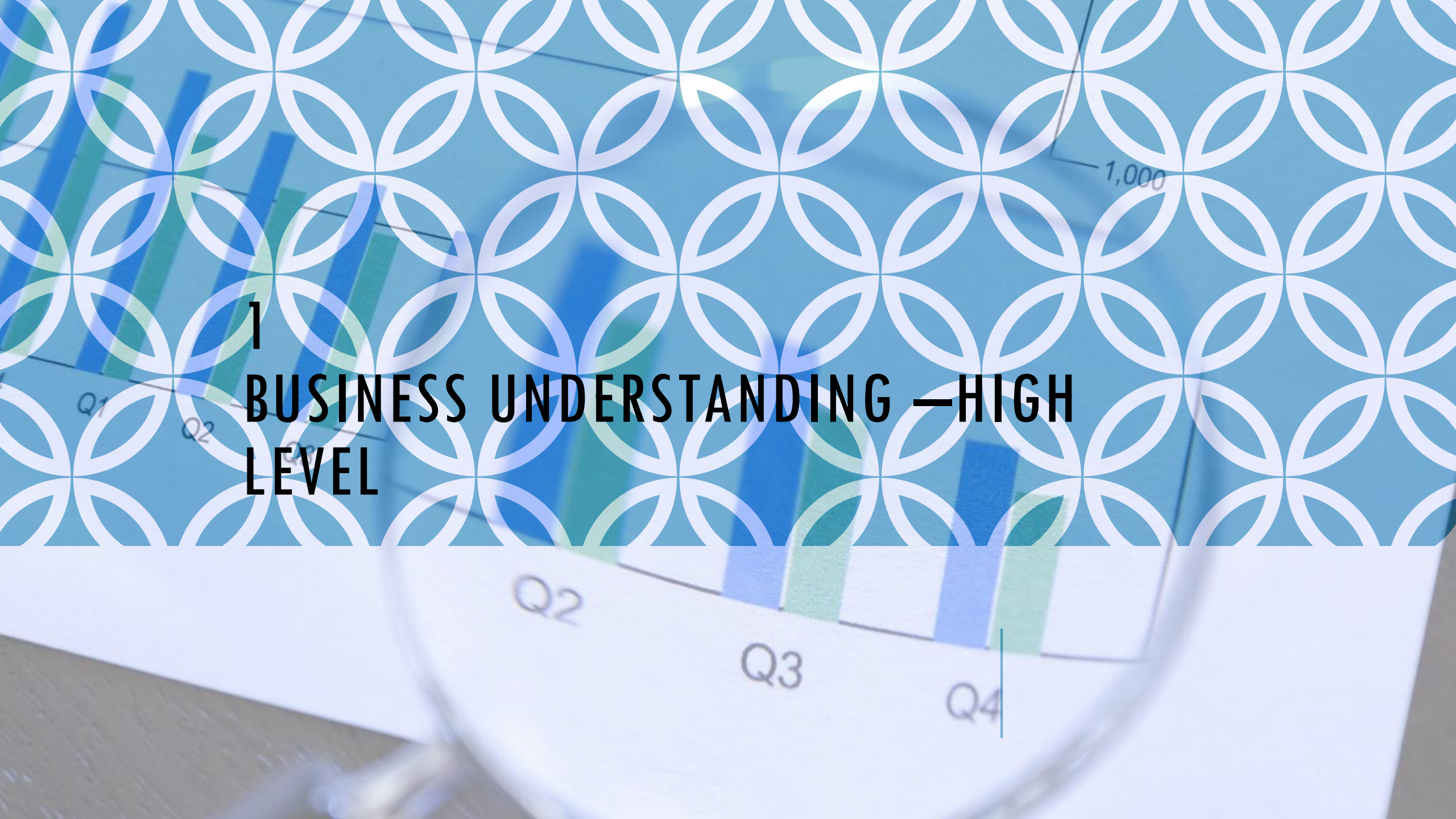
DATA 410 – ASSIGNMENT 7

FINAL PRESENTATION

Binal Patel



1 BUSINESS UNDERSTANDING – HIGH LEVEL

CASE STUDY

CANADA'S PACIFIC GROUNDFISH TRAWL FISHERY: ECOSYSTEM CONFLICTS

https://cases.open.ubc.ca/canada-pacific-groundfish-trawl/

INTRODUCTION

Case study involves ENGOs's Concern about destruction of numerous species because of British Columbia's commercial capture (wild) fishery.

5W 1H ANALYSIS
1 – WHO

#	Question	Answer
Q1.1	Who is involved?	The B.C. groundfish trawl fishery, ENGOs, Department of Fisheries and Oceans (DFO)
Q1.2	Who is affected?	Because of the overfishing IT will affect Aquatic culture, fishing communities, consumers, Government
Q1.3	Who will benefit?	Mostly commercial fishing industry will get benefit but after taking needed actions industries, Aquatic life and also Government will benefit together
Q1.4	Who will be harmed?	Groves and forests of sponge and coral, non-target species which includes vulnerable and protected species

5W 1H ANALYSIS
2 – WHAT

#	Question	Answer
Q2.1	What is your topic narrowed down in a simple phrase/sentence?	ENGOs trying to save Marine Habitat which is in danger because of the BC commercial Fishery like B.C. groundfish trawl fishery
Q2.2	What does your topic involve? (i.e. What are the different parts to it?)	- Loss of marine life because of commercial Fishery - History before 1995 closed and 1997 reopened with new measurement - Ecosystem conflicts because of Overfishing
Q2.3	What is it similar to / different from?	N/A
Q2.4	What might be affected/changed by your topic?	While the specifics of ecosystem conflicts may differ in various regions, the broader issues of overfishing, bycatch, habitat damage, and the need for sustainable fisheries management are relevant on a global scale

5W 1H ANALYSIS
3 –WHEN

#	Question	Answer
Q3.1	When does this take place? When did this take place? When will it take place? When should this take place?	Fishing industry conflicts were there since 1980 but In mid 2000 the ENGOs were started protesting
Q3.2	Does when this takes place affect the topic?	Yes, the timeframe or when the topic takes place can have an impact on the understanding and context of the ecosystem conflicts in Canada's Pacific groundfish trawl fishery. The timeframe can influence several aspects, including: Historical trends and change Regulatory and management changes

5W 1H ANALYSIS
4 – WHERE

#	Question	Answer
Q4.1	Where does this take place? (Where did it …. Where will it … Where should it ….?)	It took place in British Columbia which involves BC groundfish trawl fishery
Q4.2	Does it matter where it takes place? Is it affected by location?	Yes, The negotiations were successful and led to world's first habitat bycatch limitation agreement, which came into place in 2012

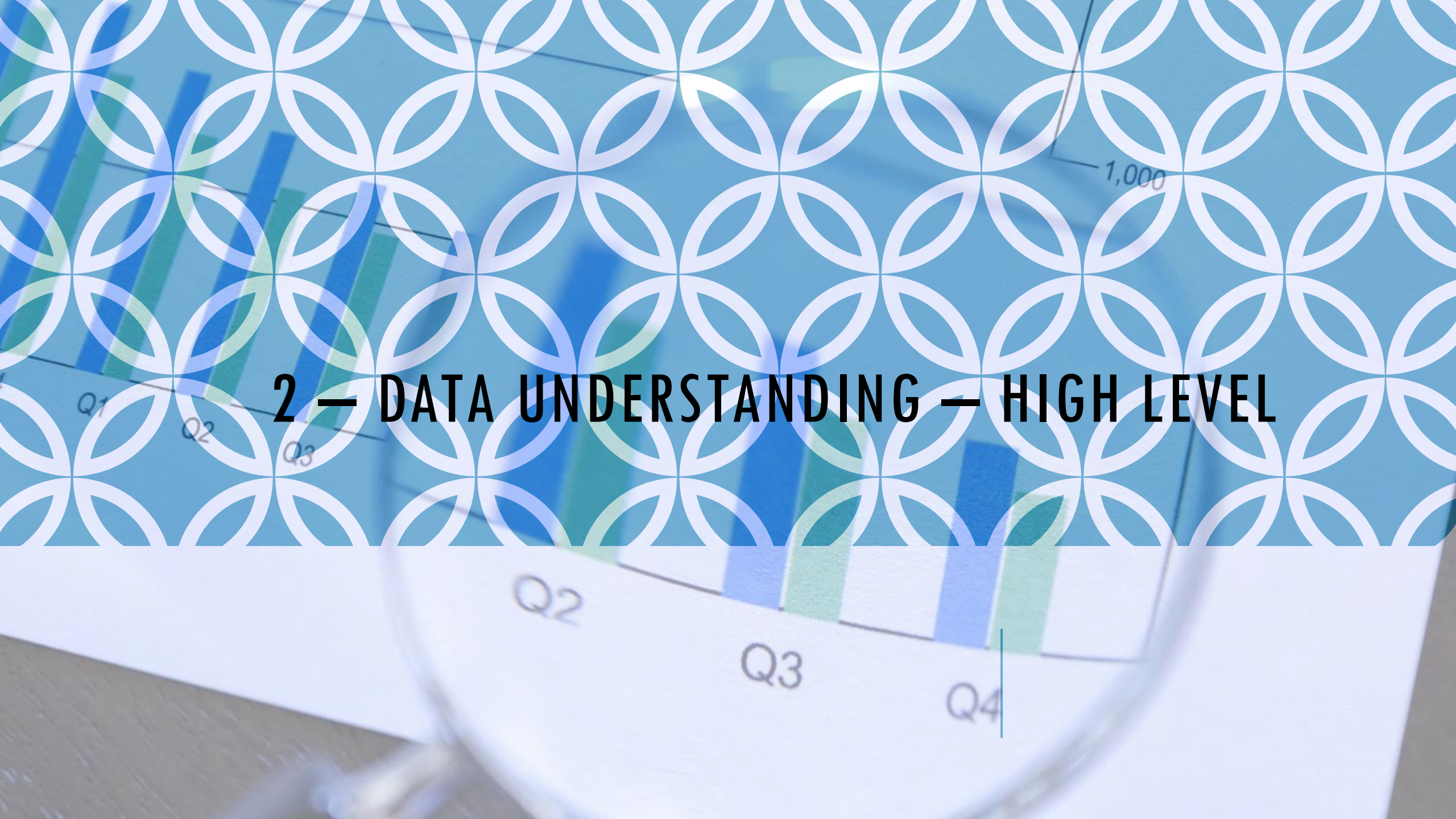
5W 1H ANALYSIS
5 – WHY

#	Question	Answer
Q5.1	Why is this topic important? Why does it matter?	It raises the question of the applicability of the B.C. experience to other fisheries in Canada and the rest of the world. As marine habitat is most important part of food chain
Q5.2	Why do certain things happen? (What are some causes and effects within the topic?)	Causes Overfishing , Bycatch, Ecosystem damage Effects Threat to non-target species Decline in target species Socio-economic impacts

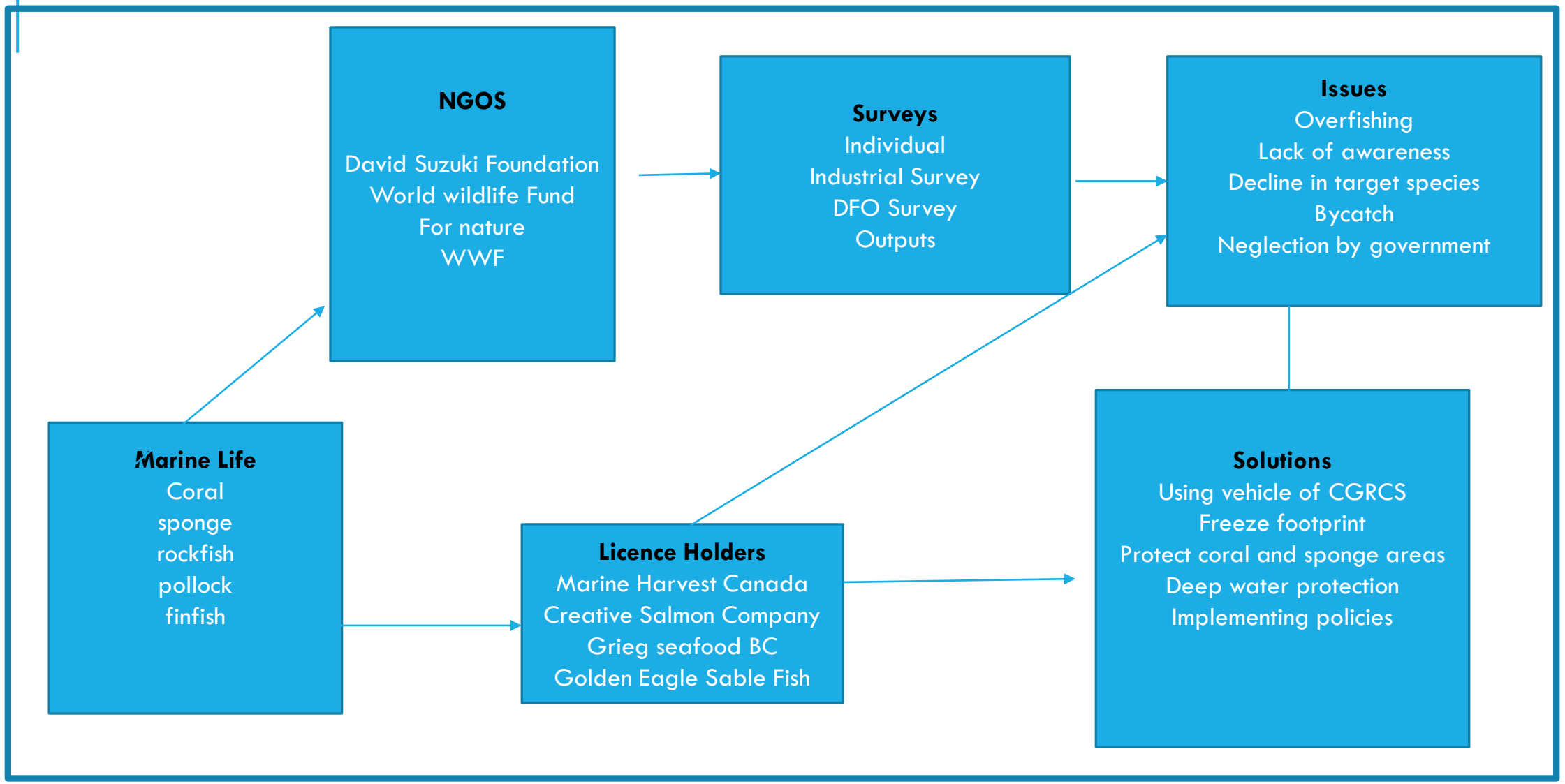
5W 1H ANALYSIS
6 – HOW

#	Question	Answer
Q6.1	How does this topic work? How does it function? How does it do what it does?	For fishing the vessels employ trawl nets, the bottom trawling brought seabed which damage to the aquatic habitat ENGOs make a complain to save the marine habitat Then conflict was resolved in the form a world precedent agreement
Q6.2	How did it come to be?	In past when 1997 the fishery was reopened with not so popular management system in which DFO divided TACs among the vessels in the form of Individual Transferable Quotas and also the industries were not fewer than 30 Which make impossible to monitoring
Q6.3	How are those involved affected?	Fishing Industry – Overfishing can lead to financial losses Non-target Species and Ecosystem- population decline Environmental Organizations-raise awareness about the impacts on non-target species Government and Management Agencies- Balancing the interests of different stakeholders, implementing effective regulations.

2 – DATA UNDERSTANDING – HIGH LEVEL



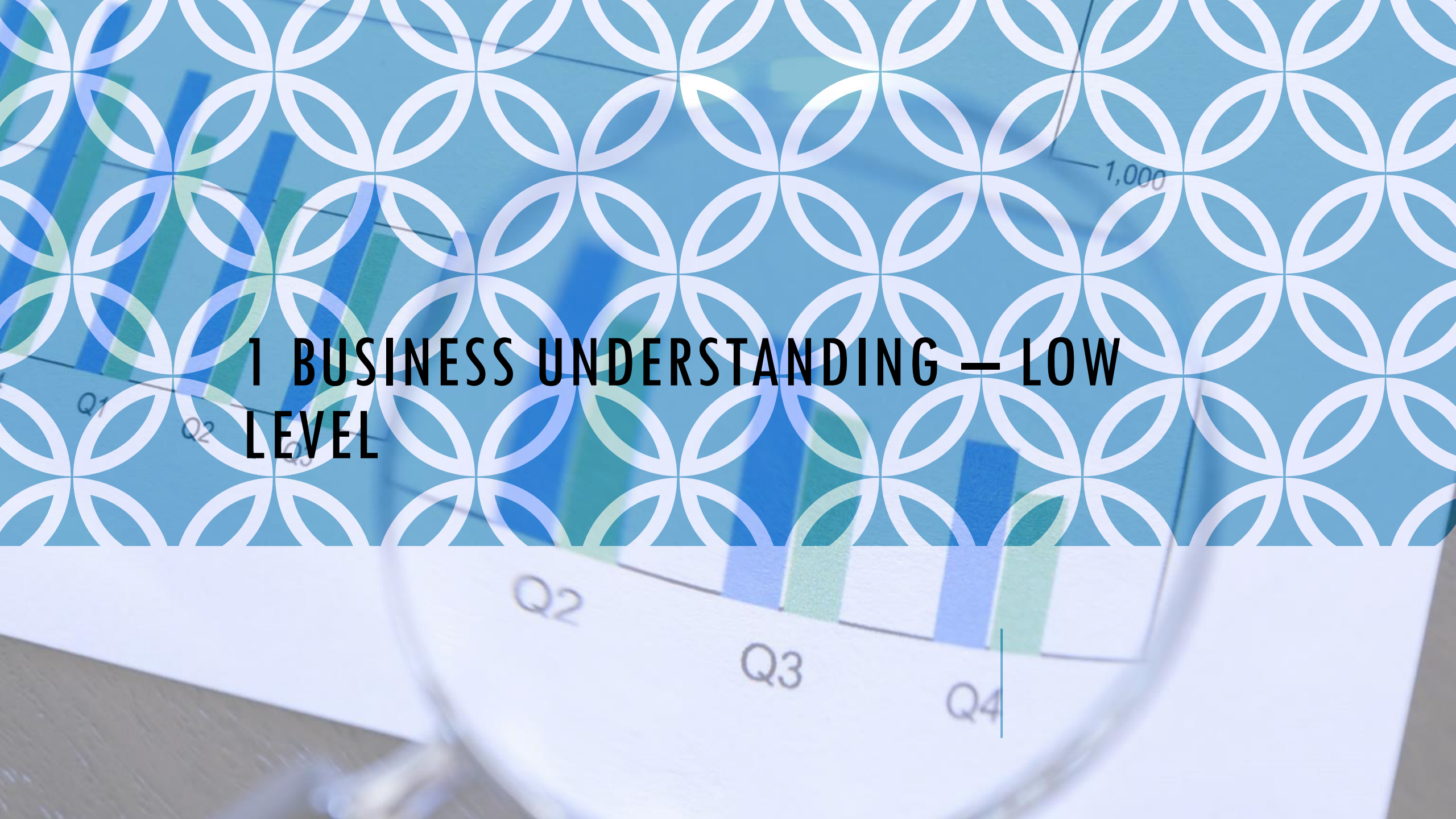
DATA MODELING – CONCEPTUAL MODEL



DATA DICTIONARY

No	Topic	Definition
1	ENGO	Environmental non government organization
2	TACs	Total allowable catches
3	ITQs	Individual transferable quotas
4	DFO	Department of Fisheries and Oceans
5	CGRCS	The Canadian Groundfish Research and Conservation Society
6	Negative Externalities	The industries which were effected externally to the issue
7	marine Habitats	Habitats which support marine life
8	coral	Coral species include the important reef builders that inhabit tropical oceans
9	CFIA	Canadian Food Inspection Agency
10	Licence Holders	Industries which holds licence for commercial fishery and working with EBGOs to overcome the issues
11	IHNv	Infectious Haematopoietic Necrosis virus

1 BUSINESS UNDERSTANDING — LOW LEVEL



BUSINESS QUESTIONS

1. What is the Percentage ratio of outcome for Industrial survey and DFO Survey ?
2. Sum of Total number of dead wild fish caught yearly by their name with and without depopulation order from the CFIA to control infectious virus.
   In which year the death occurred by Infectious hematopoietic necrosis virus (IHNv)?
   Basically compare the both data.

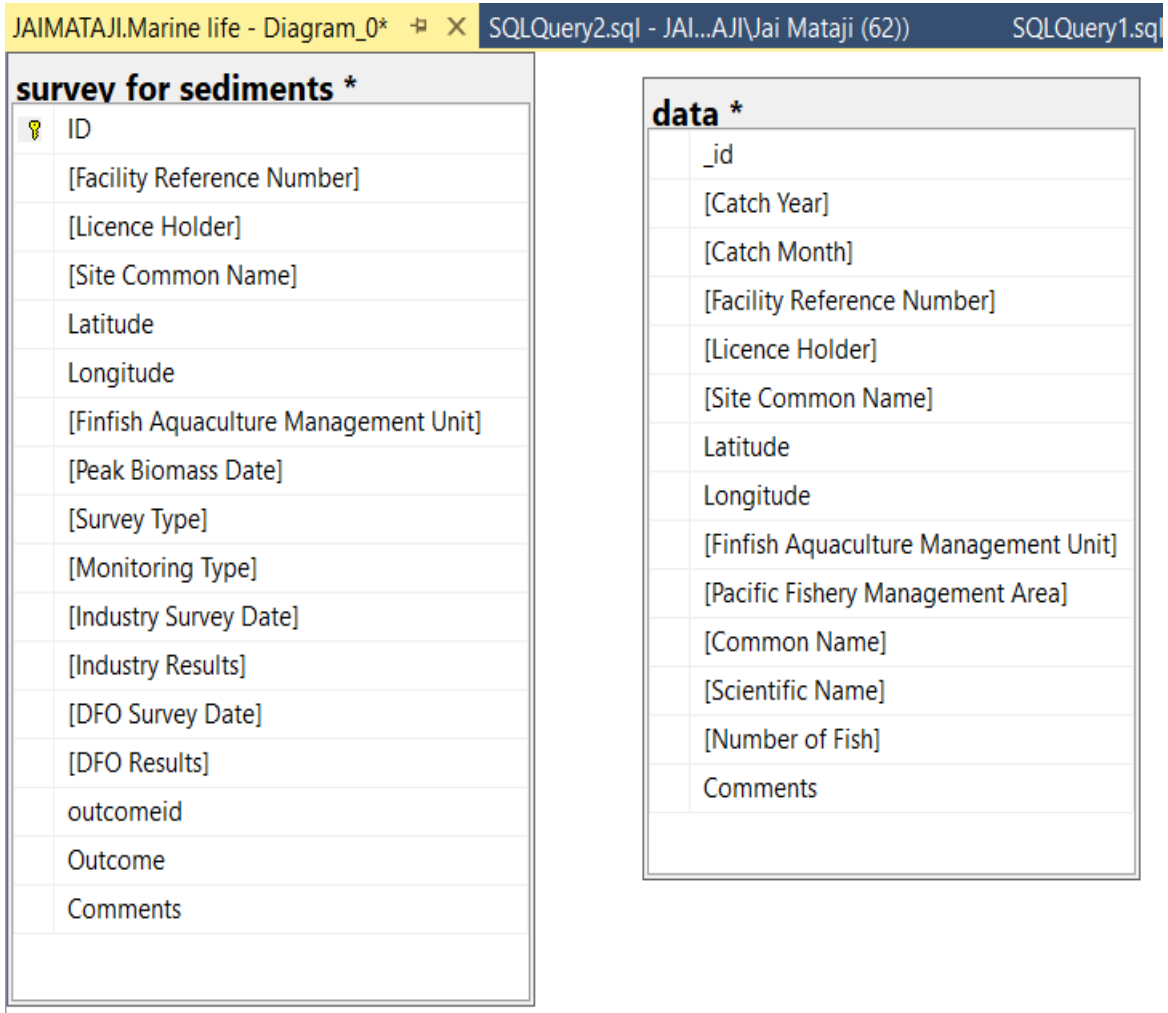
2 DATA UNDERSTANDING – LOW LEVEL

DATA SET(S)

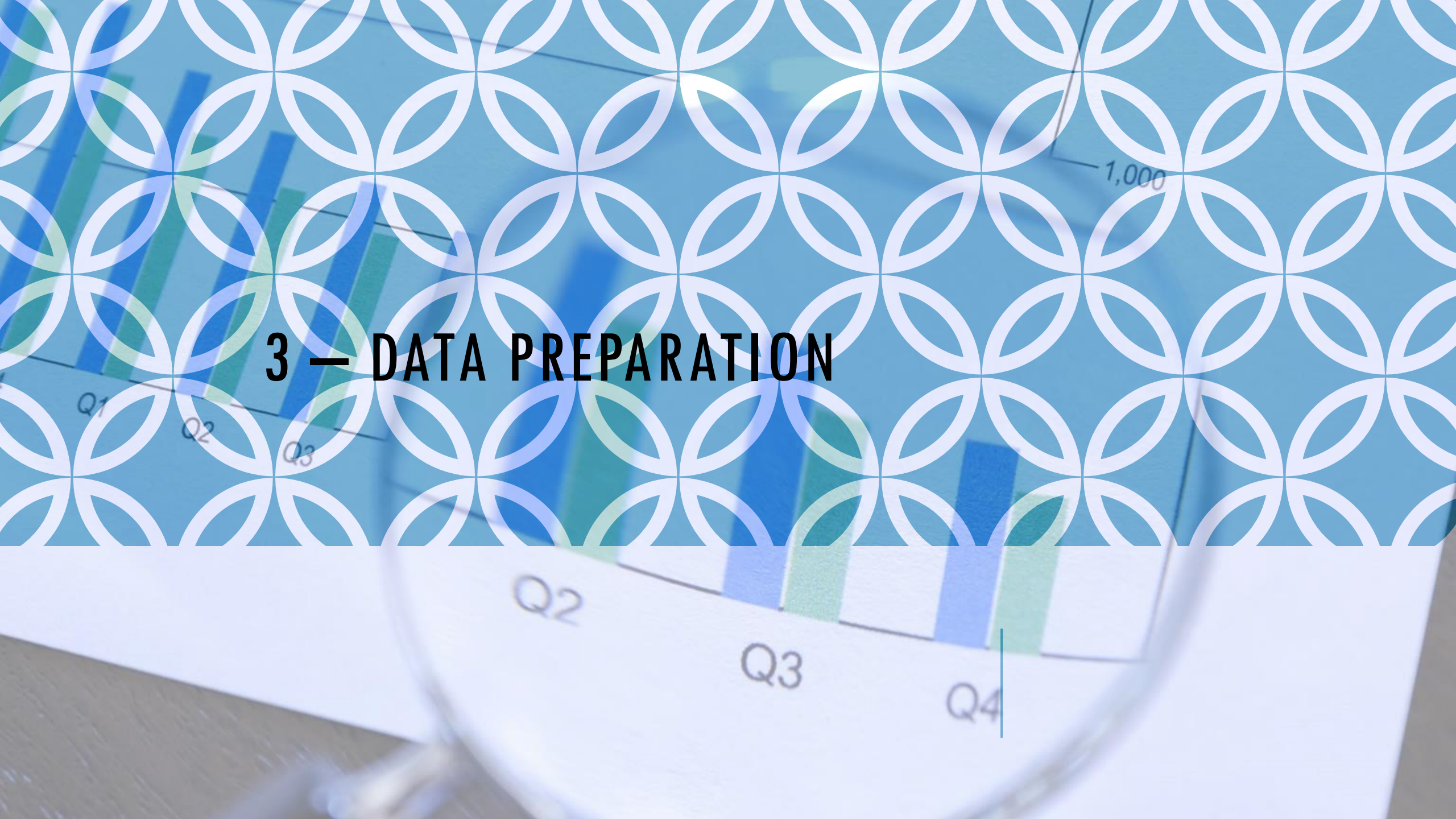
Incidental catch at BC marine finfish aquaculture sites
https://open.canada.ca/data/en/dataset/0bf04c4e-d2b0-4188-9053-08dc4a7a2b03/resource/98874925-9cd8-4663-ac23-4186ad070eb3

Results of DFO benthic audits of British Columbia marine finfish aquaculture sites
https://open.canada.ca/data/dataset/c1a54a0c-4eb0-4b50-be1f-01aee632527e/resource/f51236a0-4ccc-4fd1-9fd0-f4a109065732/download/benth-audit-surv-2011-ongoing-rpt-pac-dfo-mpo-aquaculture-eng.csv

DATABASE DIAGRAM – TABLES AND COLUMNS



3 — DATA PREPARATION



DATA PREPARATION – DATA CLEANSING

K
25-06-2014
26-08-2014
21-07-2014
18-09-2014
27-05-2015
28-05-2015
28-04-2015
08-04-2015
20-05-2015
21, 22- Apr-15
26, 27-Aug-15
18-08-2015
17-08-2015
7, 29-Jul-15
20-07-2015
13-07-2016
21-03-2016
18-04-2016
02-03-2016
26-04-2016
11-04-2016
23-08-2016
30-05-2016
30-05-2016
02-08-2016

DFO Survey Date	DFO Results	outcomeid	Outcome	Comments
12-07-2011	1 of 4 sediment sampling stations had chemical changes to the seabed which require additional monitoring	0	There is disagreement between DFO and industry results. When this occurs, DFO results are used.	n/a
23-08-2011	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
24-08-2011	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
14-09-2011	All transect videos showed acceptable levels of visual indicators of impact	1	There is agreement between DFO and industry results	n/a
24-07-2012	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
25-07-2012	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
08-08-2012	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
13-08-2012	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
14-08-2012	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
15-08-2012	2 of 8 sediment sampling stations had chemical changes to the seabed which require additional monitoring	1	There is agreement between DFO and industry results	DFO sampli
23-08-2012	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
06-09-2012	1 of 4 sediment sampling stations had chemical changes to the seabed which require additional monitoring	0	There is disagreement between DFO and industry results. When this occurs, DFO results are used.	n/a
11-09-2012	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
22-10-2012	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
11-04-2013	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
24-04-2013	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
02-05-2013	1 of 4 sediment sampling stations had chemical changes to the seabed which require additional monitoring	1	There is agreement between DFO and industry results	n/a
27-05-2013	2 of 2 transect videos showed levels of visual indicators which require additional monitoring	0	There is disagreement between DFO and industry results. When this occurs, DFO results are used.	n/a
28-05-2013	All transect videos showed acceptable levels of visual indicators of impact	1	There is agreement between DFO and industry results	n/a
29-05-2013	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
30-05-2013	All transect videos showed acceptable levels of visual indicators of impact	1	There is agreement between DFO and industry results	n/a
25-06-2013	All sediment sampling stations had acceptable levels of chemical impact; All transect videos showed acceptable	1	There is agreement between DFO and industry results	n/a
29-08-2013	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a
21-05-2014	All sediment sampling stations had acceptable levels of chemical impact	1	There is agreement between DFO and industry results	n/a

- Modified Date column
- Added new column exa. - OutcomeID
- Remove null values

DATA PREPARATION – SQL QUERY FOR QUESTION 1

```
select [Site Common Name], [Industry Survey Date], [DFO Survey Date],
[Industry Results], [DFO Results], Outcome
FROM [Marine life].[dbo].[survey for sediments]
where outcomeid = 0;

select [Site Common Name], [Industry Survey Date], [DFO Survey Date],
[Industry Results], [DFO Results], Outcome
FROM [Marine life].[dbo].[survey for sediments]
where outcomeid = 1;

SELECT outcome, COUNT(*) AS outcome_count,
(COUNT(*) * 100 / (SELECT COUNT(*) FROM [Marine life].[dbo].[survey for
sediments])) AS Percentage
FROM [Marine life].[dbo].[survey for sediments]
GROUP BY outcome;
```

DATA PREPARATION – DATA SET RETURNED FOR QUERY 1

Results Messages

	outcome	outcome_count	Percentage
1	"There is disagreement between DFO and industry r...	9	6
2	There is agreement between DFO and industry resu...	129	93

Results Messages

	Site Common Name	Industry Survey Date	DFO Survey Date	Industry Results	DFO Results	Outcome
1	Indian Bay	2011-08-26 00:00:00.000	2011-07-12 00:00:00.000	All sediment sampling stations had acceptable lev...	1 of 4 sediment sampling stations had chemical c...	"There is disagreement between DFO and industry ...
2	Baxter Islets	2012-10-28 00:00:00.000	2012-09-06 00:00:00.000	All sediment sampling stations had acceptable lev...	1 of 4 sediment sampling stations had chemical c...	"There is disagreement between DFO and industry ...
3	Kunechin	2013-08-13 00:00:00.000	2013-05-27 00:00:00.000	1 of 2 transect videos showed levels of visual indic...	2 of 2 transect videos showed levels of visual indic...	"There is disagreement between DFO and industry ...
4	Plover Point	2014-07-21 00:00:00.000	2014-08-08 00:00:00.000	1 of 4 sediment sampling stations had chemical c...	3 of 4 sediment sampling stations had chemical c...	"There is disagreement between DFO and industry ...
5	Saranac Island	2015-08-18 00:00:00.000	2015-07-27 00:00:00.000	1 of 4 sediment sampling stations had chemical c...	All sediment sampling stations had acceptable lev...	"There is disagreement between DFO and industry ...
6	Rant Point	2015-08-17 00:00:00.000	2015-07-28 00:00:00.000	All sediment sampling stations had acceptable lev...	1 of 4 sediment sampling stations had chemical c...	"There is disagreement between DFO and industry ...
7	Steamer	2017-02-21 00:00:00.000	2017-04-05 00:00:00.000	1 of 2 transect videos showed levels of visual indic...	2 of 2 transect videos showed levels of visual indic...	"There is disagreement between DFO and industry ...
8	Althorpe	2019-09-20 00:00:00.000	2019-09-23 00:00:00.000	4 of 8 sediment sampling stations had chemical c...	All sediment sampling stations had acceptable lev...	"There is disagreement between DFO and industry ...
9	Tsa-ya	2021-08-05 00:00:00.000	2021-08-19 00:00:00.000	All sediment sampling stations had acceptable lev...	1 of 2 sediment sampling stations had chemical c...	"There is disagreement between DFO and industry ...

DATA PREPARATION – DATA SET RETURNED FOR QUERY 1

Results | Messages

	Site Common Name	Industry Survey Date	DFO Survey Date	Industry Results	DFO Results	Outcome
1	Swanson	2011-10-06 00:00:00.000	2011-08-23 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
2	Port Elizabeth	2011-09-09 00:00:00.000	2011-08-24 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
3	Vantage	2011-08-16 00:00:00.000	2011-09-14 00:00:00.000	All transect videos showed acceptable levels of vis...	All transect videos showed acceptable levels of vis...	There is agreement between DFO and industry res...
4	Monday Rocks	2012-07-12 00:00:00.000	2012-07-24 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
5	Koskimo	2012-09-06 00:00:00.000	2012-07-25 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
6	Althorpe	2012-09-24 00:00:00.000	2012-08-08 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
7	Upper Retreat	2012-09-07 00:00:00.000	2012-08-13 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
8	Humphrey Rock	2012-09-20 00:00:00.000	2012-08-14 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
9	Midsummer	2012-08-22 00:00:00.000	2012-08-15 00:00:00.000	1 of 4 sediment sampling stations had chemical c...	2 of 8 sediment sampling stations had chemical c...	There is agreement between DFO and industry res...
10	Venture Point	2012-09-20 00:00:00.000	2012-08-23 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
11	Saranac Island	2012-10-09 00:00:00.000	2012-09-11 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
12	Burdwood	2012-10-30 00:00:00.000	2012-10-22 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
13	McIntyre Lake	2013-04-16 00:00:00.000	2013-04-11 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
14	Phillips Arm	2013-03-28 00:00:00.000	2013-04-24 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
15	Fortune Channel	2013-05-17 00:00:00.000	2013-05-02 00:00:00.000	1 of 4 sediment sampling stations had chemical c...	1 of 4 sediment sampling stations had chemical c...	There is agreement between DFO and industry res...
16	Site 13	2013-07-15 00:00:00.000	2013-05-28 00:00:00.000	All transect videos showed acceptable levels of vis...	All transect videos showed acceptable levels of vis...	There is agreement between DFO and industry res...
17	Salten	2013-07-10 00:00:00.000	2013-05-29 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
18	Site 9	2013-10-02 00:00:00.000	2013-05-30 00:00:00.000	All transect videos showed acceptable levels of vis...	All transect videos showed acceptable levels of vis...	There is agreement between DFO and industry res...
19	Doyle Island	2013-06-19 00:00:00.000	2013-06-25 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
20	Eagle Bay	2013-08-25 00:00:00.000	2013-08-29 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
21	Koskimo	2014-06-23 00:00:00.000	2014-05-21 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
22	Monday Rocks	2014-05-26 00:00:00.000	2014-05-22 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
23	Charlie's Place	2013-12-10 00:00:00.000	2014-05-27 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
24	Centre Cove	2013-12-10 00:00:00.000	2014-05-28 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...
25	Culloden	2014-09-24 00:00:00.000	2014-06-30 00:00:00.000	All sediment sampling stations had acceptable lev...	All sediment sampling stations had acceptable lev...	There is agreement between DFO and industry res...

DATA PREPARATION – SQL QUERY FOR QUESTION 2

```sql
-- total wild fish caught for each year
  select [Catch Year], sum([Number of Fish])as Totalfish
  FROM [Marine life].[dbo].[data]
  group by [Catch Year]
  order by [Catch Year] desc;

-- total wild fish caught by their name
  Select [Common Name], Sum([number of Fish]) as totalfish
  FROM [Marine life].[dbo].[data]
  group by [Common Name];
```

DATA PREPARATION – SQL QUERY FOR QUESTION 2

```
-- this will include data which has comment " depopulation from CFIS to
control infectious virus"
  Select [Catch Year], [Catch Month],[Licence Holder], [Common Name],[Number
of Fish], Comments
  FROM [Marine life].[dbo].[data]
  where Comments != 'n/a';


  -- this query will give the total dead wildfish caught for each year by
their name

  Select [Catch Year],[Common Name],sum([Number of Fish])as WildFish
  FROM [Marine life].[dbo].[data]
  where Comments = 'n/a'
  group by [Catch Year] , [Common Name]
  order by [Catch Year] desc;
```

DATA PREPARATION – DATA SET RETURNED FOR QUERY 2

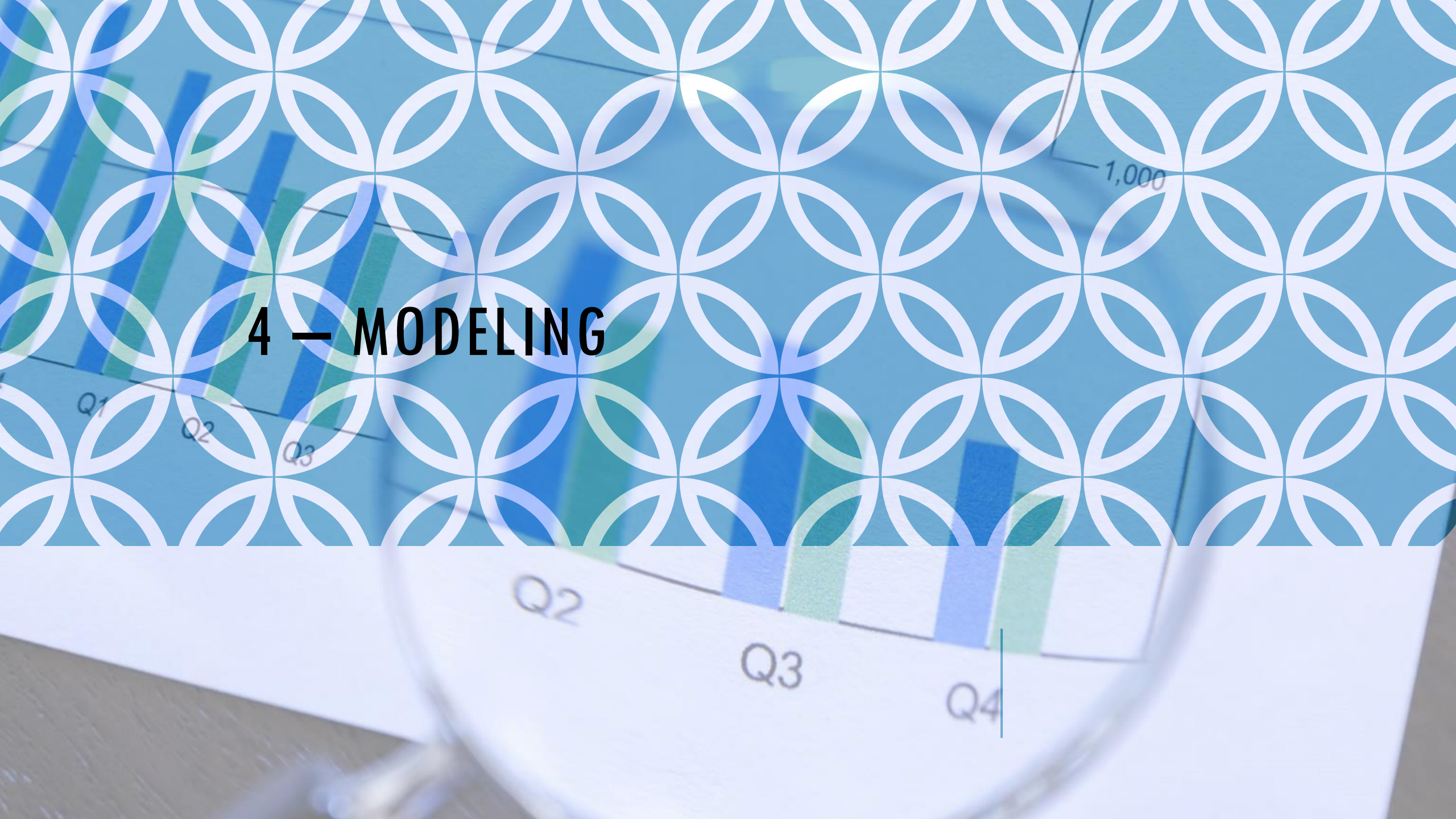
	Catch Year	Totalfish
1	2023	5312
2	2022	817265
3	2021	169017
4	2020	38174
5	2019	6019
6	2018	22485
7	2017	105450
8	2016	53478
9	2015	42506
10	2014	25819
11	2013	25818
12	2012	420185
13	2011	11384

	Catch Year	Common Name	TotalFish
1	2023	Chinook Salmon	1
2	2023	Codfish	5
3	2023	Pacific Herring	4486
4	2023	Rockfish	820
5	2022	Black Rockfish	148
6	2022	Cabezon	15
7	2022	Codfish	11
8	2022	Coho Salmon	1
9	2022	Copper Rockfish	1
10	2022	Lingcod	1
11	2022	Northern Anchovy	1
12	2022	Pacific Cod	4
13	2022	Pacific Hake	10
14	2022	Pacific Herring	816326
15	2022	Pacific Staghorn Sculpin	4
16	2022	Pacific Tomcod	5
17	2022	Pile Perch	280
18	2022	Pink Salmon	14
19	2022	Rockfish	37
20	2022	Sablefish	14
21	2022	Sculpin	19
22	2022	Shiner Perch	102
23	2022	Striped Seaperch	74
24	2022	Surfperch	179
25	2022	Unknown	9
26	2022	Walleye Pollock	10

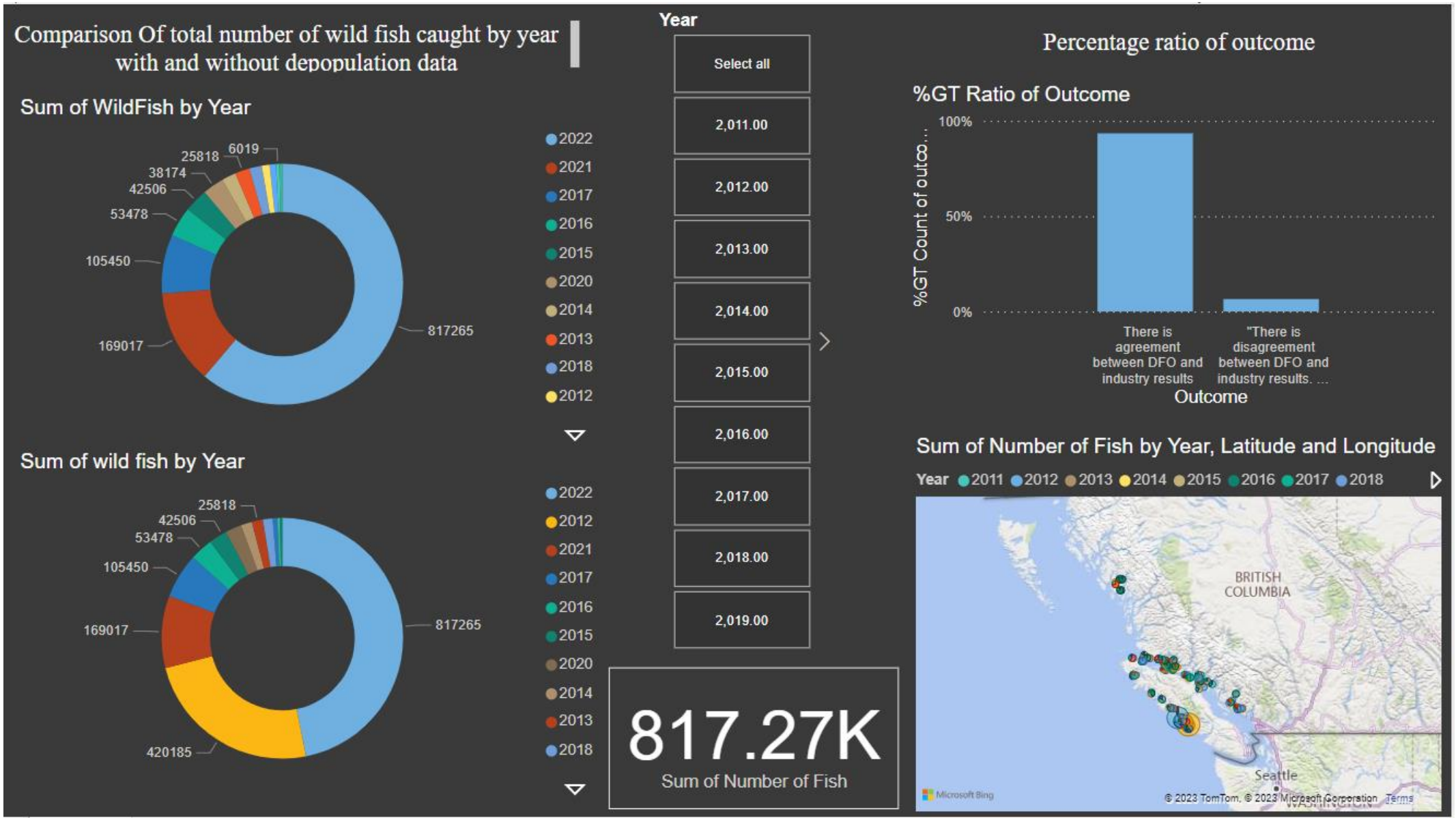
	Common Name	totalfish
4	Pacific Staghorn Sculpin	196
5	Kelp Greenling	12
6	Lingcod	18
7	Pacific Herring	1654272
8	Starry Flounder	1
9	Sockeye Salmon	2
10	Spotted Ratfish	8
11	Blue Rockfish	2
12	Pacific Hake	158
13	Striped Seaperch	1021
14	Silver Surfperch	3
15	Walleye Pollock	3809
16	North Pacific Spiny Dogfish	13
17	Kelp Perch	31
18	Lobefin Snailfish	1
19	Pacific Salmon	10
20	Sablefish	10305
21	Yellowtail Rockfish	6479

	Catch Year	Catch Month	Licence Holder	Common Name	Number of Fish	Comments
1	2012	May	Mainstream Canada	Pacific Herring	358726	Incidental catch th Click to select the whole column FIA to control the spread of Infectious Haematopoietic Necrosis virus (IHNv) and not unintentional/accidental.
2	2012	August	Mainstream Canada	Pacific Herring	47500	Incidental catch the result of a depopulation order from the CFIA to control the spread of Infectious Haematopoietic Necrosis virus (IHNv) and not unintentional/accidental.

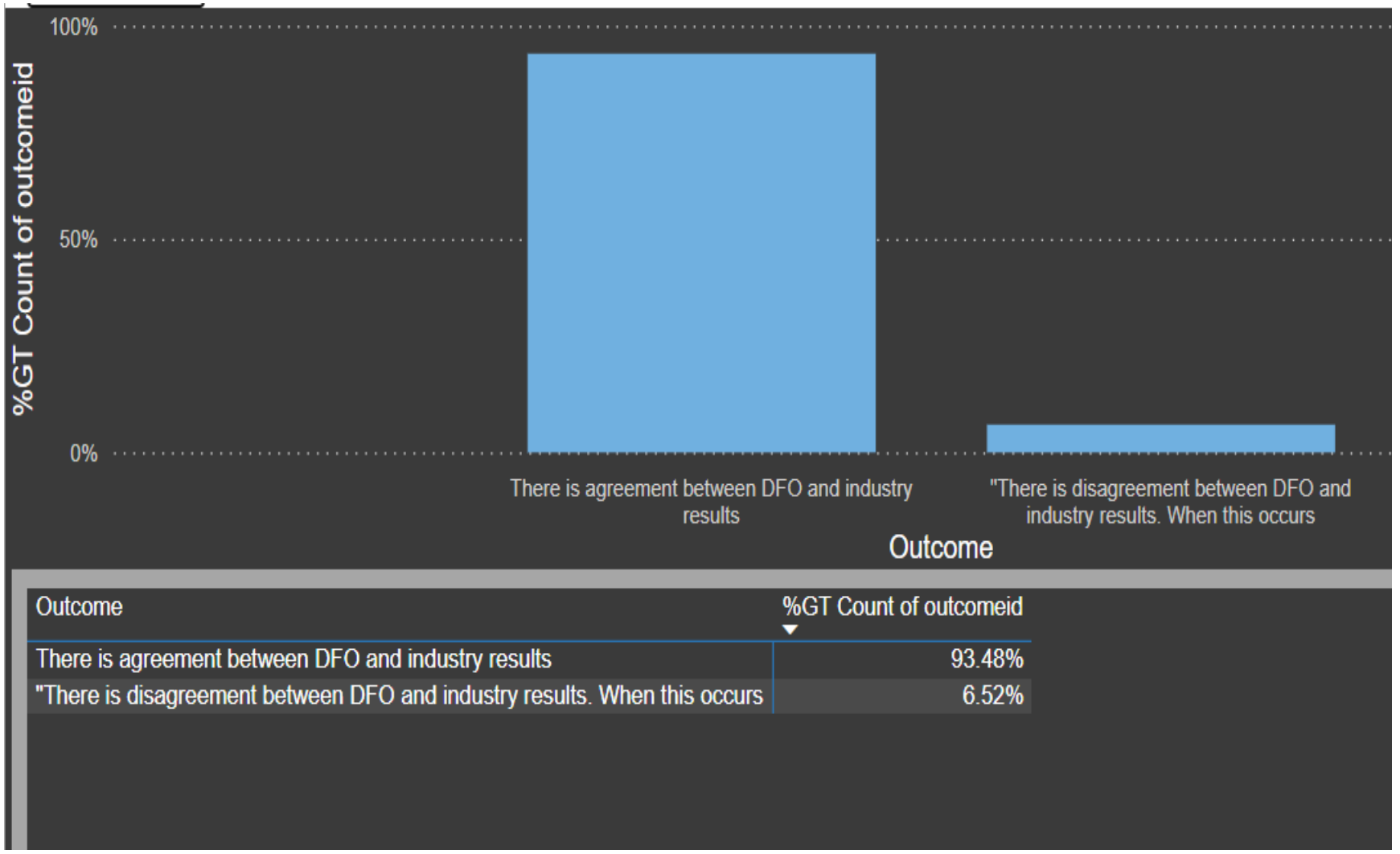
4 — MODELING



VISUALIZATION - DASHBOARD

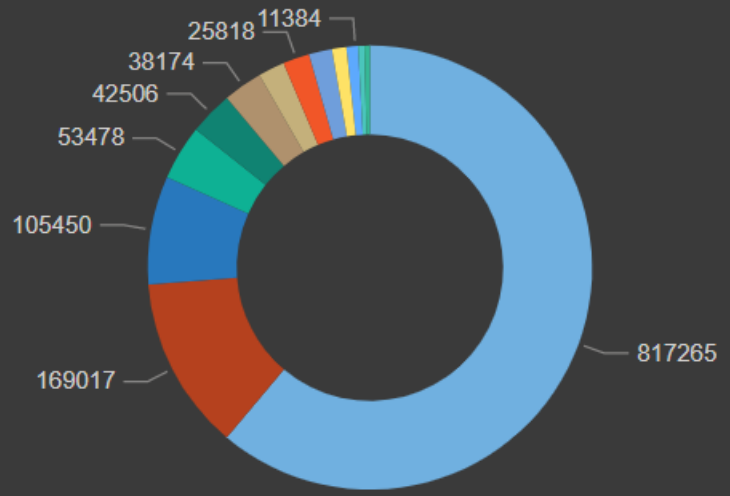


VISUALIZATION – REPORT 1



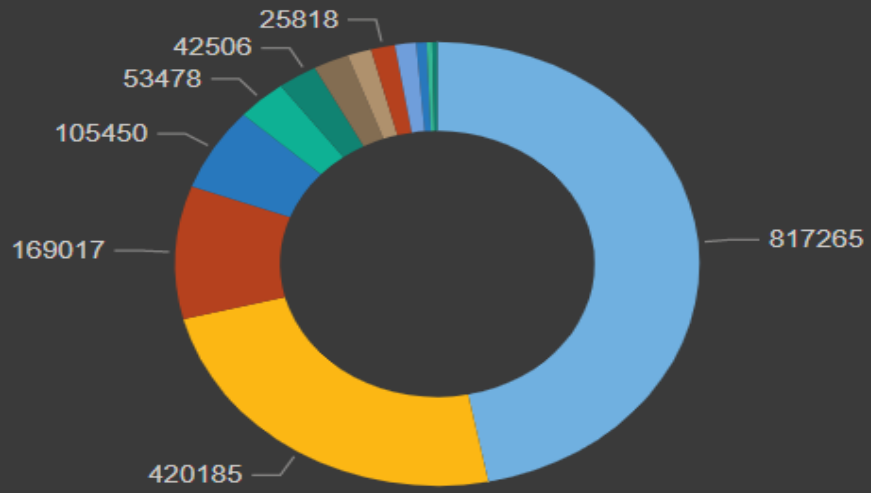
Outcome	%GT Count of outcomeid
There is agreement between DFO and industry results	93.48%
"There is disagreement between DFO and industry results. When this occurs	6.52%

VISUALIZATION – REPORT 2



Year	Sum of WildFish
2,022.00	8,17,265.00
2,021.00	1,69,017.00
2,017.00	1,05,450.00
2,016.00	53,478.00
2,015.00	42,506.00
2,020.00	38,174.00
2,014.00	25,819.00
2,013.00	25,818.00
2,018.00	22,485.00
2,012.00	13,959.00
2,011.00	11,384.00
2,019.00	6,019.00
2,023.00	5,312.00

VISUALIZATION – REPORT 2

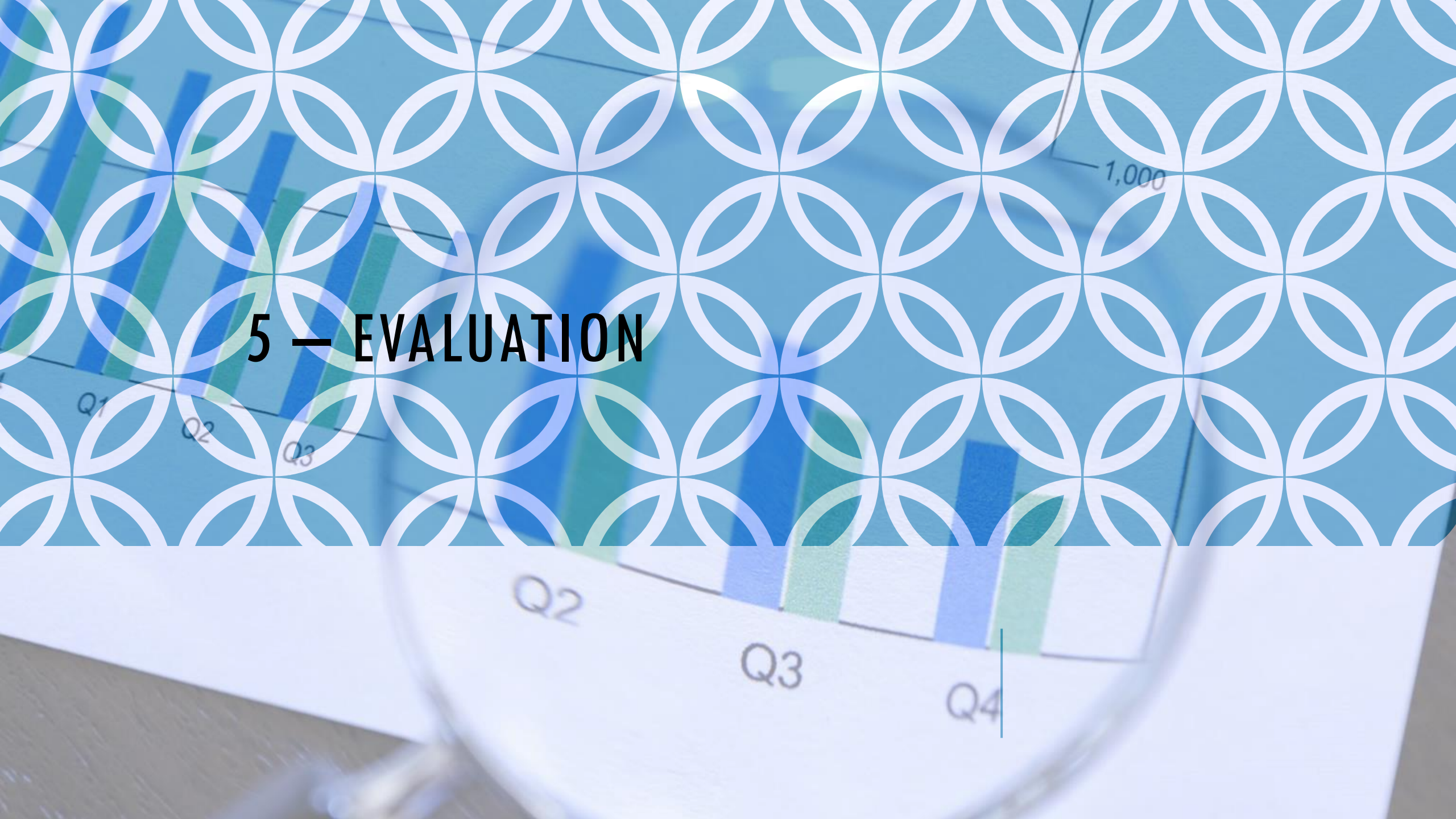


Year	Sum of wild fish
2,022.00	8,17,265.00
2,012.00	4,20,185.00
2,021.00	1,69,017.00
2,017.00	1,05,450.00
2,016.00	53,478.00
2,015.00	42,506.00
2,020.00	38,174.00
2,014.00	25,819.00
2,013.00	25,818.00
2,018.00	22,485.00
2,011.00	11,384.00
2,019.00	6,019.00
2,023.00	5,312.00

VISUALIZATION – REPORT 2

	1.2 Year	ABC Catch Month	ABC Licence Holder	ABC Common Name	1.2 Number of Fish	ABC Comments
1	2012	May	Mainstream Canada	Pacific Herring	358726	Incidental catch the result of a depopu...
2	2012	August	Mainstream Canada	Pacific Herring	47500	Incidental catch the result of a depopu...

5 – EVALUATION



CONCLUSION – ANSWER TO QUESTION 1

After Analyzing and visualizing it can be stated that for agreement between Industrial survey and DFO survey outcome is 93.4% and for Disagreement outcome is 6.54% .

CONCLUSION – ANSWER TO QUESTION 2

In 2012 CFIA order depopulation to control the spread of Infectious Hematopoietic Necrosis virus (IHNv) and not unintentional/accidental.