SD4402

※弊会記入欄

（学校用）

様式 A-1

(FY2023)

2024 年 2 月 23 日

サイエンス・ダイアログ　実施報告書

1. 学校名・実施責任者氏名: 長野県諏訪清陵高等学校

2. 講師氏名: Dr. Wai Mun LUM

3. 講義補助者氏名: 長井　敏

4. 実施日時: 2024 年 2 月 22 日（ 木 ） 14 : 30 ～ 16 : 50

5. 参加生徒: ___年生 ___人、 2 年生 21 人、 ___年生 ___人（合計 21 人）
   備考:（例:理数科の生徒） 沖縄研修参加予定者

6. 講義題目: 赤潮とはなにか？ その発生のメカニズム

7. 講義概要:全世界で発生し、海洋の生態系に深刻な打撃を与える赤潮発生のメカニズムと被害および
   その対策にういて

8. 講義形式:
   ☒対面 ・ □オンライン （どちらか選択ください。）
   1) 講義時間 120 分　　質疑応答時間 30 分

   2) 講義方法（例:プロジェクター使用による講義、実験・実習の有無など）
      日本語の説明入りのスライドにそって講義

   3) 事前学習
      (有) ・ 無 （どちらかに〇をしてください。）
      使用教材 自作の予備テキストにて事前に基本的概念を説明

9. その他特筆すべき事項:

本校の生徒は概して好奇心が強く、特に環境問題を将来の研究対象と考えている生徒も少なからずいる。この種の講演は専門用語が多用されるので、事前にテキストを用意したが、それでも理解が追いつかない部分もあったと思う。
しかしながら、多くの生徒は真剣に講義に耳を傾け、講義の概要は理解できた印象を受ける。
前回もそうだが、講師の熱意が聴き手に伝わり、非常に有意義な講義であったと思う。

SD
※弊会記入欄

Form B-2
(FY2023)
Must be typed

Date（日付）
26 FEBRUARY 2024

Activity Report -Science Dialogue Program-
（サイエンス・ダイアログ事業　実施報告書）

- Fellow's name（講師氏名）: LUM WAI MUN（ID No. P23086）

- Name and title of the accompanying person（講義補助者の職・氏名）
SATOSHI NAGAI, LEAD RESEARCHER, FISHERIES TECHNOLOGY INSTITUTE

- Participating school（学校名）: SUWA SEIRYO HIGH SCHOOL

- Date （実施日時）: 22 FEBRUARY 2024

- Lecture title（講義題目）:
RED TIDES OR HARMFUL ALGAL BLOOMS (HABS)

- Lecture format（講義形式）:
  ◆☒Onsite ・ □Online (Please choose one.)（対面 ・ オンライン）（（どちらか選択ください。））
  ◆Lecture time（講義時間）90 min（分）, Q&A time（質疑応答時間）20 min（分）
  ◆Lecture style（ex.: used projector, conducted experiments）
  （講義方法（例：プロジェクター使用による講義、実験・実習の有無など））
  USED PROJECTOR

- Lecture summary（講義概要）: Please summarize your lecture within 200-500 words.

I started the lecture with a brief introduction of my education background, including my hometown, undergraduate and postgraduate universities, and life experiences, then continued to the main content of the lecture. The lecture first introduced the life under microscope, including zooplankton, phytoplankton and microplastics. Then, a comprehensive overview of red tides was provided, highlighting the definition, related organisms, types of red tides, causes, and impacts on aquatic organisms and humans. Red tides, or harmful algal blooms (HABs), can be caused by different groups of organisms, including diatoms, dinoflagellates and raphidophytes. The importance of accurate species identification using various microscopies and molecular technologies was emphasized. The lecture highlighted several common HABs species in Japan, and the impacts they have caused to Japan fisheries industries. Pictures and videos of these species were shown to help students grasp what kind of organisms they can find if they have chance to search in the seawater samples. Then, the lecture introduced four main types of the red tides that are categorized based on their cause and effects, including toxic red tides, noxious red tides, biomass

red tides, and diatom blooms. The toxic red tides that include five types of poisoning in shellfish and fish were thoroughly explained. Each of the potential causative species and their impacts of fisheries and humans were highlighted.

Factors affecting the red tides were also introduced. Nutrient enrichment (eutrophication) due to human factors, warm water temperatures, and global warming that causes more extreme weathers like storms or typhoons that further contribute to higher intensity and frequency of red tides were also explained. These red tide events can lead to toxicity in fish, shellfish contamination, respiratory irritation, and other health issues in humans. The complex relationship between climate change and red tide events were discussed, emphasizing how global warming and extreme weather events can exacerbate these phenomena.

Two case studies of red tides in Japan, including Seto Inland Sea and Hokkaido red tide in 2021 were presented. In the Seto Inland Sea, the expansion of industries had caused excessive nutrient loading into the seawater, which caused the increase of red tides in the area that had killed many fishes. An implementation of law and regulation had helped to control the wastewater discharge and nutrient levels, which resulted in the reduction of red tides frequency and fish kills, showing a successful water quality control example.

Various potential solutions and strategies, including individual actions to mitigate the red tides were presented, including water quality management, sustainable fishing and aquaculture practices, biological and physical controls, regular monitoring, research and innovation, and public awareness. The students were encouraged to be aware of individual actions that can help mitigating global warming and red tide occurrences. Lastly, I encouraged students to explore and expand their perspectives by studying or traveling abroad.

◆Other noteworthy information（その他特筆すべき事項）:

Upon request from Suwa Seiryo High School's teacher, Yoshikoshi-sensei, I had also revised and prepared a material containing details of my lecture contents, including red tides, types of red tides, their causes and impacts, potential solutions, and possible individual efforts to mitigate red tides, before the lecture day. The material was shared to students beforehand, to help them to understand my lecture better.

- Impressions and comments from the accompanying person（講義補助者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。）:
No comment.