Title : Hydrogeochemistry and Fluoride Contamination of Groundwater Resources in Saraphi and San Kamphaeng Districts, Chiang Mai Province

Author(s) : **1.** Ms. Sirikwan Chaimongkol **Student ID :** 640510433

Major : Geology

Advisor(s) : **1.** Dr. Rungroj Benjakul

Type of presentation* *(choose 1)* **:**

- ☐ **Oral Presentation** (เฉพาะ ตัวแทนนศ.ที่สาขาเลือกให้นำเสนอแบบบรรยาย)
- ☑ **Poster** (กรณี นำเสนอผลงานปัญหาพิเศษ/การค้นคว้าอิสระ)
- ☐ **Cooperative Education** (กรณี นำเสนอผลงานสหกิจศึกษา)

ABSTRACT

Fluoride contamination in groundwater resources is a significant environmental and public health concern, particularly in areas where fluoride-rich minerals and specific hydrogeological conditions foster fluoride accumulation and dissolution. This study investigates the hydrogeochemical characteristics of groundwater in Saraphi and San Kamphaeng Districts and analyzes the relationship between fluoride concentrations and other chemical components. Geographic Information System (GIS) techniques were employed to assess the spatial distribution of fluoride, identifying high-risk areas in Chiang Mai Province with high fluoride contamination. These areas are located near geothermal sources, such as the San Kamphaeng hot springs, which may contribute to fluoride contamination in groundwater. Groundwater samples were collected from 18 shallow and deep wells across the study area. Physical parameters were measured in the field using a pH/ORP meter to determine pH and temperature, while electrical conductivity (EC) was measured using an EC meter. Other chemical components were analyzed in the laboratory. Anion analysis was conducted using titration methods, with a turbidimeter employed to detect sulfate and turbidity. Cation analysis was performed using an Atomic Absorption Spectrophotometer (AAS). Fluoride concentration was measured using an Ion-Selective Electrode (ISE) to investigate the relationship between fluoride levels and other chemical components in groundwater. The results indicated that approximately 40% of the groundwater samples had fluoride concentrations exceeding the Ministry of Natural Resources and Environment (Thailand)'s standard limit of 0.7 mg/L. A positive correlation was observed between fluoride concentrations and the levels of sodium (Na^{+}) and calcium (Ca^{2+}). In addition, physical parameters, such as temperature and pH, exhibited a relationship with fluoride concentrations. This study

**Type of presentation must be matched with an option you choosing on student upload system.*

***The abstract can be more than one page and must be approved by project advisor before upload.*

enhances the understanding of hydrogeochemical processes that influence fluoride accumulation in groundwater, providing crucial insights for groundwater quality management in affected areas. The findings offer guidelines for mitigating fluoride contamination, including the development of strategies to reduce fluoride levels in groundwater.

**Type of presentation must be matched with an option you choosing on student upload system.*

***The abstract can be more than one page and must be approved by project advisor before upload.*