SUPERVISOR
Taishi Yazawa

Komaba-ike Pond

Water-Quality Field Study

Environmental Management

STUDENT
Carlesso Nicolò
Urban Engineering

INTRODUCTION

Water quality monitoring is important for both ecological conservation and environmental management. Regular assessment can help detect early changes and support better maintenance of this environment.
This study evaluates water quality across three sampling sites and four sampling dates by combining on-site measurements of turbidity, electrical conductivity, pH, temperature, and TDS with laboratory analysis of ammonium, nitrate, and nitrite. Since nitrogen compounds influence nutrient cycling, algal growth, and oxygen availability, their monitoring provides useful information on possible eutrophication risk and ecosystem stress.The original contribution of this work is a preliminary spatial and temporal assessment of Komaba-ike Pond based on repeated field and laboratory observations.

OBJECTIVE

To evaluate spatial and temporal variations in Komaba-ike Pond water quality and identify preliminary implications for environmental management through repeated monitoring of physicochemical parameters and nitrogen compounds.

Key question

Do water quality parameters vary between sampling sites and over time in Komaba-ike Pond?

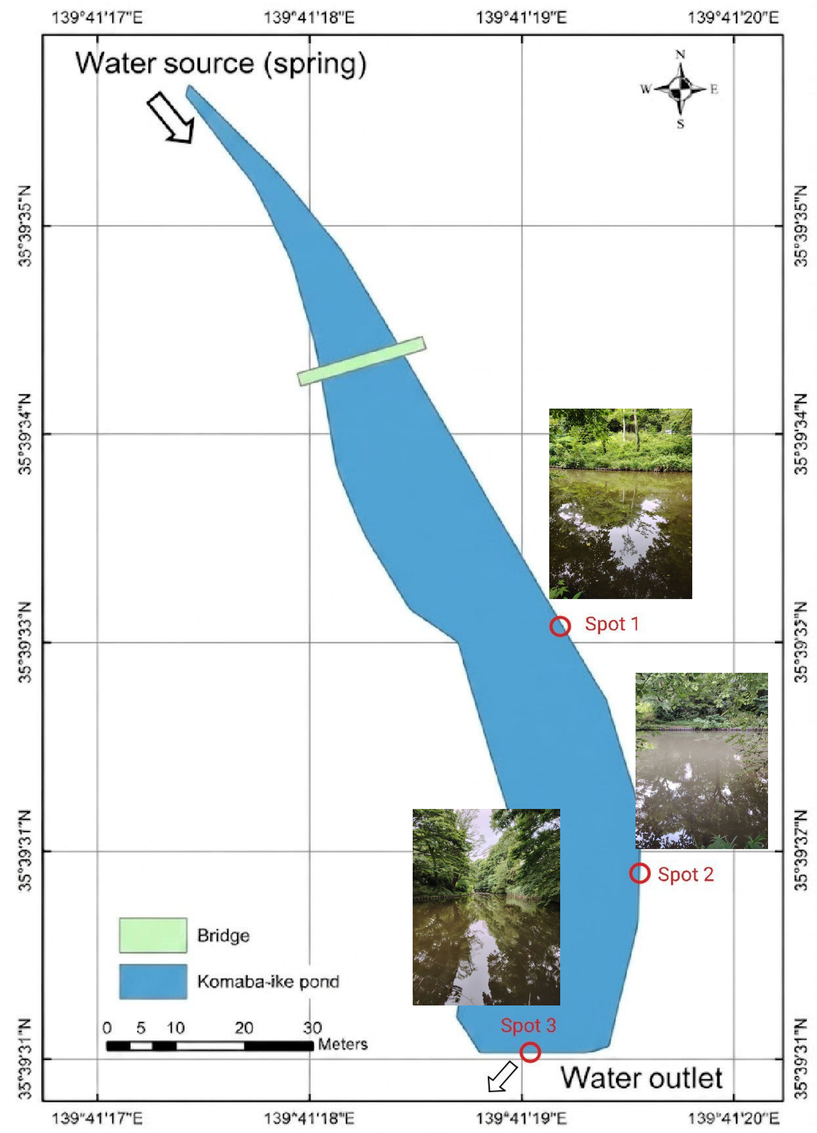


Fig. 1 Sampling sites — Spot 1 to Spot 3 along Komaba-ike Pond.

METHODOLOGY

Water Sampling and In-situ Measurements

Water samples were collected from three different sites within Komaba-ike Pond, located on the Komaba Campus. Sampling was conducted during four field campaigns on May 14, May 21, May 28, and June 18.

At each sampling site, several water quality parameters were measured immediately after sample collection. Water temperature, electrical conductivity, total dissolved solids (TDS), and pH were measured using a portable water quality meter. Turbidity was measured separately using a turbidimeter.

Laboratory Chemical Analysis

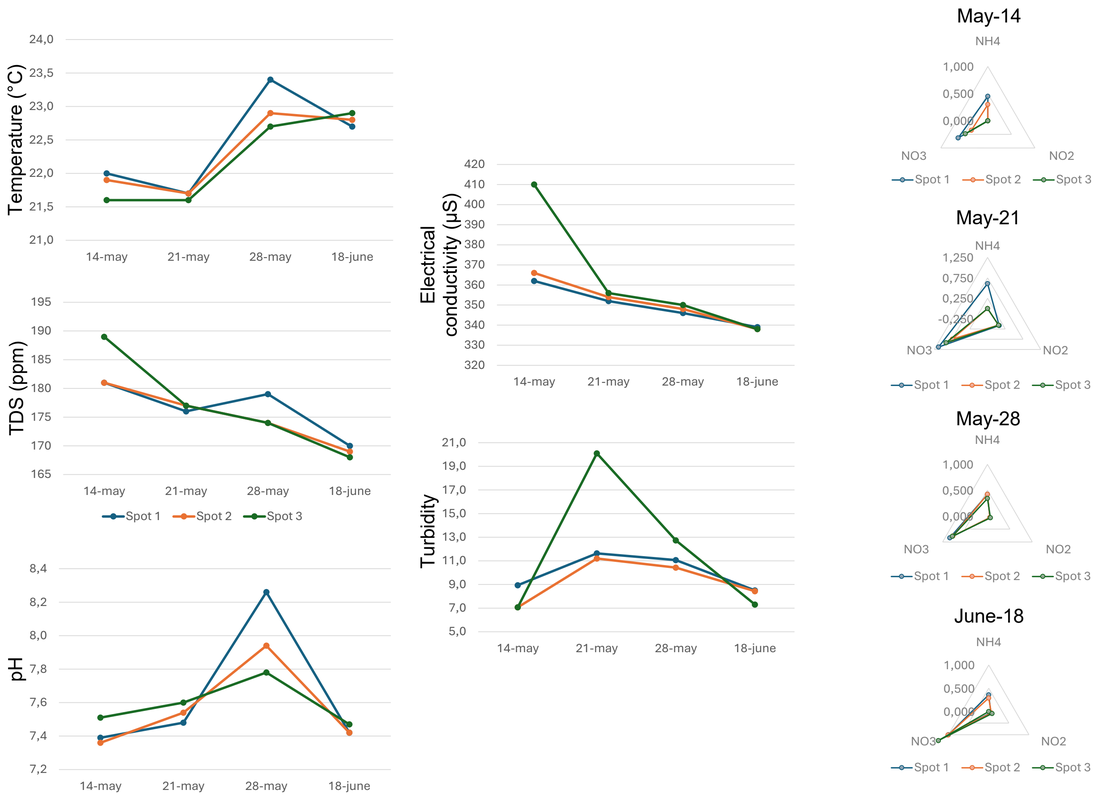
After field sampling, the collected water samples were analyzed in the laboratory using digital pack tests. The concentrations of ammonium (NH_4^+-N), nitrate (NO_3^--N), and nitrite (NO_2^--N) were determined for each of the three sampling sites.

Fig. 2 In-situ measurements

Fig. 3 Turbimeter

Fig. 4 Digital Packtest analysis

RESULTS



Temperature and pH peaked around 28 May, while TDS and electrical conductivity generally decreased from May to June. Turbidity showed the highest variability, especially at Spot 3 on 21 May, suggesting a localized increase in suspended particles. Overall, the three sites showed similar trends, with turbidity being the most spatially variable parameter.

DISCUSSION

Season/Rainfall: TDS and conductivity decreased from May to June, possibly due to dilution or changing water input.
Water conditions: Temperature and pH peaked around 28 May, showing short-term variation in the pond.
Nitrogen compounds: Nitrate increased toward June, while ammonium and nitrite varied by site and date.
Field observations: Leaves, debris, organisms, and the observed dead turtle may help explain local water quality changes.
Management: Regular monitoring, especially after rainfall, and removal of excess organic debris could support better pond management.
Main point: Most parameters showed similar temporal trends, while turbidity had the strongest local variation, especially at Spot 3.

FUTURE DIRECTIONS

Future work should include seasonal monitoring, more sampling points, and measurements after rainfall events. These data could support better management of Komaba-ike Pond by helping identify nutrient inputs, reduce eutrophication risk, and plan regular water-quality monitoring.