Plan Overview

A Data Management Plan created using DMPTool

Title: Hakai Institute Juvenile Salmon Program Time Series

DMP ID: https://doi.org/10.48321/D1CW23

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Funder: Tula Foundation (tula.org)

Template: Hakai Institute Data Management Plan

Project abstract:

The Hakai Institute Juvenile Salmon program is an ongoing initiative that was established in 2015 in partnership with the University of British Columbia, University of Toronto, Simon Fraser University and Salmon Coast Field Station. This program researches the early life history of juvenile salmon in coastal British Columbia. Primary research objectives are determining: 1) Migration timing rates and routes; 2) Migration habitat, including physical and chemical oceanographic conditions, and availability of plankton prey; 3) The impacts of prey phenology, quantity and quality on juvenile salmon growth and condition; 4) Species and stock-specific feeding biology and competitive interactions; 5) Pathogen and parasite infection dynamics; and 6) Mortality estimates. The program targets Fraser River sockeye, and pink and chum salmon, but additionally provides information on coho, chinook, and herring through incidental capture. The field program operates between May and July during the peak of the juvenile sockeye outward migration. Purse seine and oceanographic sampling are conducted in the northern Strait of Georgia / Discovery Islands region (~ 220 km from the Fraser River mouth).

Start date: 05-12-2015

Last modified: 12-08-2021

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Hakai Institute Juvenile Salmon Program Time Series

Data Management Plan

Adapt, edit, add and remove sections below to complete your Data Management Plan as you see fit.

Data Overview
The core of the Hakai JSP are the observations made at sea during seining operations, and the observations and measurements made in the lab during fish dissections. Many samples are produced from fish that are collected in the lab, and those data may be addressed in their own Data Management Plans.

Data from the field and lab dissections are lumped into the Hakai JSP Time Series at www.github.com/hakaiinstitute/jsp-data and includes:
- Catch abundance by species
- Fork lengths and weights
- Sea lice counts
- Visual transect surface activity counts
- Survey metadata
- CTD data
- YSI Data
- Genetic Stock ID results

Laboratory samples' unique identifiers are also stored in the GitHub jsp-data repository, while their physical location is tracked in eLab software. This includes:
- Muscle tissue for fatty acid analysis, isotope ratios, RNA:DNA ratios, genetic stock identification
- Fin clips for genetic stock ID
- Liver, kidney, heart, brain, gill tissues for histology and pathogen analysis
- Otoliths for ageing and microchemistry analysis
- Zooplankton samples

Data Storage and QA/QC Procedures
Most data are collected on physical data sheets in the field and in the lab, with the exception of CTD data which is recorded on the instrument and metadata are collected using digital Forms on a tablet. Physical spreadsheets from the field and the lab are transcribed as soon as possible by entering data into Google Sheets spreadsheets. These spreadsheets have numerous quality assurance features including conditional formatting for accidentally duplicated fields, expected ranges of values, drop down selection of categorical variables, and index-matches to look up values from a reference table to auto populate some data entry fields. Every row of data that is entered is double-checked for accuracy and transcription errors by visually cross-referencing the physical data sheet with the google sheet by someone who didn't enter the data.

We use a new Googlesheets workbook for each field and lab season. At the end of each field season data from the annual spreadsheets are copied into the Master JSP Data Tables spreadsheet, or the Master JSP Sample Inventory which contains all years of data. These spreadsheets are then read into an data-integration-and-QC.R script which conducts Quality Checks in part by building a relational data model that checks the validity of primary and foreign keys ie. whether every sample has a corresponding fish, and every fish has a corresponding seine, and every seine belongs to a survey. The structure and contents of the JSP data model can be seen in this Entity Relationship Diagram. This script also checks for outliers in various variables, and makes sure that all locations are not on land and more.

For complete documentation of the data processing steps see our jsp-data README file and read through the comments in the various scripts.

Data Sharing Policy and Timeline
Data produced in the field and the lab dissections carried out by Hakai staff will be made public within 6 months of collection. Being made public refers to the data being uploaded to the Hakai JSP GitHub repository which can be accessed by anyone. The data are available immediately to internal collaborators, including UBC graduate students in the Pelagic Ecosystems (Hunt) Lab in their raw format via googlesheets.

Data are released under CC BY 4.0 and have no ethical or legal restrictions on their use.

Data produced from secondary sample processing, such as fatty acids, eDNA, stomach contents and so
are embargoed for a period of up to three years so that students have first-access rights. These types of projects need to create a standalone Data Management Plan.

**Data Publishing Plan**
Core observations made in the field and from lab dissections conducted by Hakai staff including species counts, fork lengths, weights, sea lice counts, and genetic stock ID are published to the Ocean Biodiversity Information System [here](https://www.obis.org) which also is automatically registered with the Global Biodiversity Information Facility [here](https://www.gbif.org). These records will be updated annually. Both of these records link back to the central Hakai Institute Data Catalogue record for the Juvenile Salmon Program which is referenced with a Digital Object Identifier at [https://doi.org/10.21966/1.566666](https://doi.org/10.21966/1.566666)

We also publish an annual report as a North Pacific Anadromous Fish Commission Document.

Secondary sample processing results and or derived/synthesis data sets should be made public by depositing data to a generalist data repository such as Dryad but they must reference the Hakai JSP DOI [https://doi.org/10.21966/1.566666](https://doi.org/10.21966/1.566666) and be shared with the JSP data managers.

**Roles and Responsibilities**

- **Review Data Management Plan:** Brett Johnson, Brian Hunt
- **Update Raw Field and Lab Data from Google sheets to GitHub:** Krystal Bachen
- **Publish Updated Time-series Data to OBIS:** Tim van der Stap
Planned Research Outputs

Dataset - "Hakai Institute Juvenile Salmon Program"
The Hakai Institute Juvenile Salmon Program has been monitoring juvenile salmon migrations in the Discovery Islands and Johnstone Strait in British Columbia Canada, since 2015 to understand how ocean conditions experienced by juvenile salmon during their early marine migration impacts their growth, health and ultimately survival. The data published to the Ocean Biodiversity Information System (OBIS) includes the long-term catch abundance by species, with associated fork lengths and weights. Additionally, it includes data on sea lice counts and genetic stock ID results.

Dataset - "RNA:DNA growth data"
Dataset will contain the RNA:DNA ratio data to indicate growth. Jessica Garzke (UBC) is the responsible party for this dataset.

Dataset - "Juvenile salmon fatty acid"
This dataset will include fatty acid data derived from juvenile salmon tissue samples.

Dataset - "UBC Hakai Acoustic Tagging"
Acoustic data was collected as part of the Juvenile Salmon Program (JSP) in 2018. The responsible party for this dataset is Stephen Johnston (UBC).

Dataset - "UBC Hakai JSP Zooplankton Taxonomy"
Zooplankton taxonomic data was collected in parallel to the Juvenile Salmon Program (JSP) in 2019. Natalie Mahara is the responsible party for the data.

Dataset - "JSP Otolith Microchemistry"
Microchemistry data as obtained from otolith analysis. Otoliths were obtained from juvenile salmon as part of the Juvenile Salmon Program (JSP). The responsible party for this dataset is Yuliya Kuzmenko (UBC).

Dataset - "JSP Sealice microbiome viral and bacterial data"
The responsible parties for this dataset are Tianyi Chang and Curtis Suttle.

Dataset - "Juvenile salmon isotope data"
This dataset will contain isotope data obtained from juvenile salmon caught during the JSP. The responsible party for this dataset is Brian Hunt.

Dataset - "JSP Zooplankton Isotopes"
This dataset will contain isotope data obtained from the zooplankton caught as part of the Juvenile Salmon Program (JSP). Brian Hunt is the responsible party for this dataset.

Dataset - "JSP eDNA"
Environmental DNA (eDNA) is collected as part of the Juvenile Salmon Program field operations, starting in 2020. The responsible party for this dataset is Natalie Benoit (UBC).

Dataset - "JSP Scale data"
Scales are collected and analyzed from juvenile salmon caught during the field operations of the Juvenile Salmon Program. The Hakai Institute is responsible for collecting and storing the scale data.

Planned research output details
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Related Works

Articles

- 10.5281/zenodo.5719523

Datasets

- https://doi.org/10.21966/1.566666