# What did I do?

## March 2022

* Started at DairyNZ.
* Attending Bayesian Modelling course.
* Started work on Graeme Doole FVI GAMS model.
* Ran BACH hydrograph separation for Toenepi.

## April 2022

* Delivered Dairy Systems Report for GHG Inventory project.
* Planned FVI model.
* Continued running BACH hydrograph separation for Toenepi.

## May 2022

* Initial implementation of FVI model in Rcpp and initial calibration to FVI data. Added economics.
* Reviewed papers for submission to JNZG.
* Presented NIWA mgcv::gam work to R community.
* Worked on data for GHG Inventory project.

# Summary 2021-2022

|  |  |  |
| --- | --- | --- |
| Main projects 2021-2022 | Hours | Deliverables |
| FVI | 159 | Developing FVI model and draft paper |
| GHG | 79 | Collecting data for MPI feed report |
| Other | 219 | Bayesian Modelling Course  BACH Toenepi for NIWA  Dairy Systems Report for MPI  R Community Presentation |

## June 2022

* Reviewed management rules for FVI model in Rcpp. Tidied up FVIV silage data. Implemented calibration and reporting.
* Plotted Farmax data for GHG Inventory project.

## July 2022

* Calibrated FVI model to FVIV data. Held workshops on FVI model David McCall, Alvaro, Mario, David Chapman, Wendy, Elena. Drafted FVI model milestones. Added calving spread.
* Updated Pasture Potential Tool data to latest DairyBase extract.
* Trained NIWA and GNS scientists to use BACH.
* Joined DairyBase, Milksolids, Dyna, Region data for Greenhouse Gas inventory.
* Revised NIWA TopNet S-Map paper for Channa.

## August 2022

* Added calving spread to FVI model. Added 2021 FVIV data to FVI model. Interpolated liveweight data. Rewrote milestones for FVI model.
* Prepared second report for GHG inventory. Imputation of seasonal feed use across all NZ farms.

## September 2022

* Imputed and validated seasonal feed use across all NZ farms. Prepared and delivered second milestone report for GHG inventory.
* Assembled and interpolated FVIV liveweight and body condition data for the FVI modelling. Documented the FVI model design. Designed static cow model.
* Sick with Covid.

## October 2022

* Added static cow model to JFARM.
* Calibrated JFARM to Scott Farm FVIV data. Drafted Calibration report. Still have energy balance issues.
* Added multi-parameter-set runs to JFARM, in preparation for optimization.

## November 2022

* Drafted simple management rules for JFARM and recalibrated to the Scott Farm FVIV Trial data. Added a simple output report. Calculated forage performance values.
* Included the Dairy Stats data into the GHG Inventory project and looked for ways to link it to the Farmax data.

## December 2022

* Implemented management optimization in JFARM. Refined Intake model.
* Reviewed Farmax data for GHG project. Requested updated data.
* Christmas holiday.

## January 2023

* Tidied up and plotted feed data from Farmax, DairyBase, MPI Report, Dairy Stats for the GHG Inventory project. Requested updated Farmax data. Tried to download Digad data.

## February 2023

* Worked on GHG Inventory report for MPI.
* Prepared GHG Inventory presentation for NZAGRC Workshop in Wellington (presented by Jane Kay).
* Leave without pay (Dunedin).

## March 2023

* Delivered 3rd milestone report draft for GHG Inventory to MPI.
* Worked on DIGAD data for GHG Inventory report.
* Fodder beet and Kale analysis for Barbara.

## April 2023

* Worked on DIGAD data for GHG Inventory report.
* Downloaded SMAXTEC data for Heat Stress Analysis in NZBIDA.
* Organised and attended Economics Team Day,

## May 2023

* Completed and delivered GHG Inventory Report final draft.
* Obtained and analysed NZBIDA Smaxtec sensor data for Heat Stress detection.

# Summary 2022-2023

|  |  |  |
| --- | --- | --- |
| Main projects 2022-2023 | Hours | Deliverables |
| FVI | 513 (+159 prev) | Developing FVI model and draft paper |
| GHG | 563 (+79 prev) | MPI Feed Report |
| NZBIDA | 106 | Collecting data for Northland Smaxtec analysis |
| Other | 686 | Updated Pasture Potential Tool  NIWA collaboration  Fodder beet and kale analysis |

## June 2023

* Used dbplyr to manage NZBIDA Smaxtec and weather data on Snowflake for Heat Stress detection.
* Explored sampling and clustering methods to detect Heat Stress from Smaxtec data.
* Revised GHG Inventory report to satisfy reviewers and delivered final report.

## July 2023

* Attended Economics Team Day.
* Developed model using NZBIDA Smaxtec and weather data for Heat Stress detection.
* Tidied up Abacus Bio data and scripts and repo for NZAEL ILMM Inline Milk Meter project.
* Reviewed FVI cultivar ranking script.

## August 2023

* Worked on NZBIDA heat stress model and paper.

## September 2023

* Submitted NZBIDA heat stress model paper.
* Annual Leave in China.
* Recoded and tested FVI Calculation legacy code from Cameron Ludeman.
* Tested Dairy Statistics legacy code from LIC.
* Restarted FVI Model work and started writing FVI Model paper.

## October 2023

* Drafted FVI JFARM farm optimization paper.
* Assisted with preparing data for Dairy Statistics report.
* Revised NZBIDA heat stress model paper for JDSC.
* Started NZ Region Heat Stress paper for Deep South Climate Change.
* Drafted package management guidelines for Modern Science Workflow project.

## November 2023

* Assisted with preparing data for Dairy Statistics report.
* Drafted NZ Region Heat Stress paper for Deep South Climate Change.
* Revised NZBIDA heat stress model paper for JDSC. Now accepted.

## December 2023

* Assisted with preparing Dairy Statistics report.
* Drafted NZ Region Heat Stress paper for Deep South Climate Change.
* Christmas and New Year break.

## January 2024

* Completed draft NZ Region Heat Stress paper for Deep South Climate Change.
* Preliminary DairyBase bias analysis and document.

## February 2024

* Revised NZ Region Heat Stress paper for Deep South Climate Change to updated GHLI.
* Continued DairyBase bias analysis.
* Annual leave in Haikou.

## March 2024

* Revised Wayne’s GPS paper for JNZG.
* Continued DairyBase bias analysis.
* Revised NZ Region Heat Stress paper for Deep South Climate Change.
* Revised JDSC proof.
* Obtained and plotted smaXtec and WeatherLink data for Shade study.
* Annual Leave in Melbourne, Easter.
* Drafted heat stress mapping abstract for ADSS.

## April 2024

* Revised NZ Region Heat Stress paper for Deep South Climate Change.
* Reviewed DairyNZ internal science manuscript.
* Prepared presentation for GHG workshop in Wellington.
* Imported and analysed Halter shade data.

## May 2024

* Submitted Deep South Heat Stress Mapping paper to JDS.
* Shade modelling for Frontier Farms project. Drafted science paper for JDS.
* Explored using mean z-score (MRZ) in climate maps.
* Revised and delivered Feed Consumed report for MPI.
* Imported IceQube activity data for heat and pregnancy detection.
* Imported Plantain trial data for heat stress modelling.

# Summary 2023-2024

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| --- | --- | --- |
| Main projects 2023-2024 | Hours | Deliverables |
| NZBIDA | 290 (+106 prev) | JDSC Heat Stress Paper |
| Comfort | 430 | Climate data analysis for Deep South |
| Shade | 196 | Shade data analysis for Frontier Farms |
| DairyStats | 113 | Assisted with Dairy Statistics Report |
| Other | 837 | Reviewed Abacus ILMM data  FVI cultivar ranking  FVI model paper draft |

## June 2024

* Initial look at Plantain trial data for Roshean.
* Shade modelling for Frontier Farms project.
* Fertility modelling for heat detection.
* Started looking at data for MPI GHG Liveweight project.

## July 2024

* Advanced shade modelling and paper.
* Initial plots of Liveweight data for MPI project.
* Prepared presentation on Fertility modelling for heat detection.

## August 2024

* Advanced shade modelling and paper.
* Presented fertility prediction modelling to Science Panel meeting.
* Submitted Smaxtec paper to ADSS.
* Migrated Pasture Potential Tool to Posit Connect.
* Loaded, analysed and modelled DIGAD liveweight data and prepared draft report for MPI.

## September 2024

* Worked on liveweight data and model and report for MPI.

## October 2024

* Worked on liveweight data and model and report for MPI.
* Revised Smaxtec and Deep South papers for ADSS.
* Reviewed literature for Estrus detection project.

## November 2024

* Completed liveweight report for MPI.
* Prepared Smaxtec and Deep South presentations for ADSS.
* Participated in ADSS conference in Christchurch.
* Reviewed literature for Estrus detection project.

## December 2024

* Reviewed paper for Geoscience journal.
* Refined deviation calculation and models for Estrus detection project.
* Presented heat stress work at Curiosity Session.
* Christmas Holiday.

## January 2025

* Christmas Holiday.
* Revised Deep South paper and got it accepted by APS.
* Refined lit review, deviation calculation, models and paper for Estrus detection project.

## February 2025

* Revised NIWA and GNS BACH papers.
* Refined event detection model for Estrus detection project.
* Reviewed and checked code for Shade project.
* Refereed COMPAG and ECOMOD papers.
* Presented Deep South work to DairyNZ Staff Update.
* Assisted with Liveweight Milestone 3 and 4 reports.

## March 2025

* Worked on draft manuscript for Estrus detection project.
* Worked on draft manuscript for Shade use project.
* Updated Pasture Potential Tool data and app.

## April 2025

* Worked on draft manuscript for Estrus detection project.
* Worked on draft manuscript for Shade use project.
* Updated Pasture Potential Tool data and app.
* Loaded EBV and milk data for Liveweight modelling.

## May 2025

* Incorporated EBV and milk data for Liveweight modelling Milestone 6.
* Worked on Estrus detection modelling paper.
* Submitted Shade paper to JDS.
* Developed back calculation code for Pasture Tools.
* Explored Smaxtec drinking data for Jane Kay.

# Summary 2024-2025

|  |  |  |
| --- | --- | --- |
| Main projects 2024-2025 | Hours | Deliverables |
| Comfort | 191 (+430 prev) | Deep South Heat Stress Paper for Animal Production Science  Two ADSS Papers  Presented Curiosity Session  Presented Staff Update |
| Shade | 175 (+196 prev) | Shade Paper submitted |
| Liveweight | 349 | Liveweight Report for MPI  Assisted with two other Milestone Reports. |
| Fertility | 380 | Estrus detection analysis and paper |
| Other | 554 | Looked at Plantain data and assisted with paper  Updated Pasture Potential Tool  Back-calculation method |

## June 2025

* Explored Smaxtec drinking data for Jane Kay.
* Incorporated EBV and milk data for Liveweight modelling Milestone 6.

# Summary 2025-2026

|  |  |  |
| --- | --- | --- |
| Main projects 2025-2026 | Hours | Deliverables |
| Comfort | 191 (+430 prev) | Deep South Heat Stress Paper for Animal Production Science  Two ADSS Papers  Presented Curiosity Session  Presented Staff Update |
| Shade | 175 (+196 prev) | Shade Paper |
| Liveweight | 349 | Liveweight Report for MPI |
| Fertility | 380 | Estrus detection analysis and paper |
| Other | 554 | Looked at Plantain data  Updated Pasture Potential Tool |

# Summary All Time

|  |  |  |
| --- | --- | --- |
| Main projects | Hours | Deliverables |
| FVI 2022-2023 | 513 (+159 prev) | Developing FVI model and draft paper |
| GHG 2022-2023 | 563 (+79 prev) | Feed Report for MPI |
| NZBIDA 2023-2024 | 290 (+106 prev) | JDSC Heat Stress Paper |
| DairyStats 2024 | 113 | Assisted with Dairy Statistics Report |
| Comfort 2024-2025 | 191 (+430 prev) | Deep South Heat Stress Paper for Animal Production Science  Two ADSS Papers  Presented Curiosity Session  Presented Staff Update |
| Shade 2024-2025 | 175 (+196 prev) | Shade Paper in prep for AABS |
| Liveweight 2025 | 349 | Liveweight Report for MPI |
| Fertility 2025 | 380 | Estrus Detection Paper in prep for JDS |