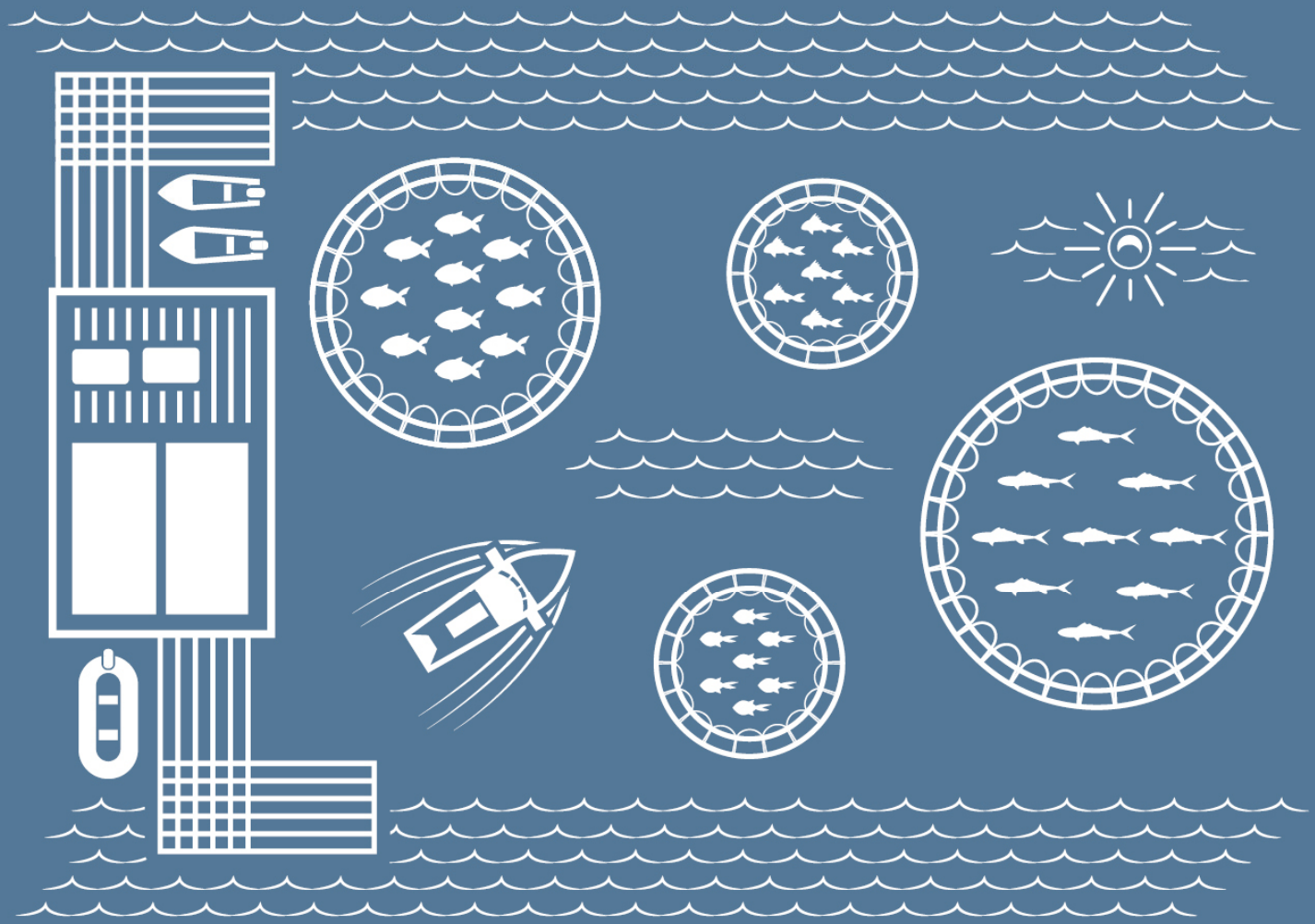
Aquaculture Service Capability Statement

Introduction



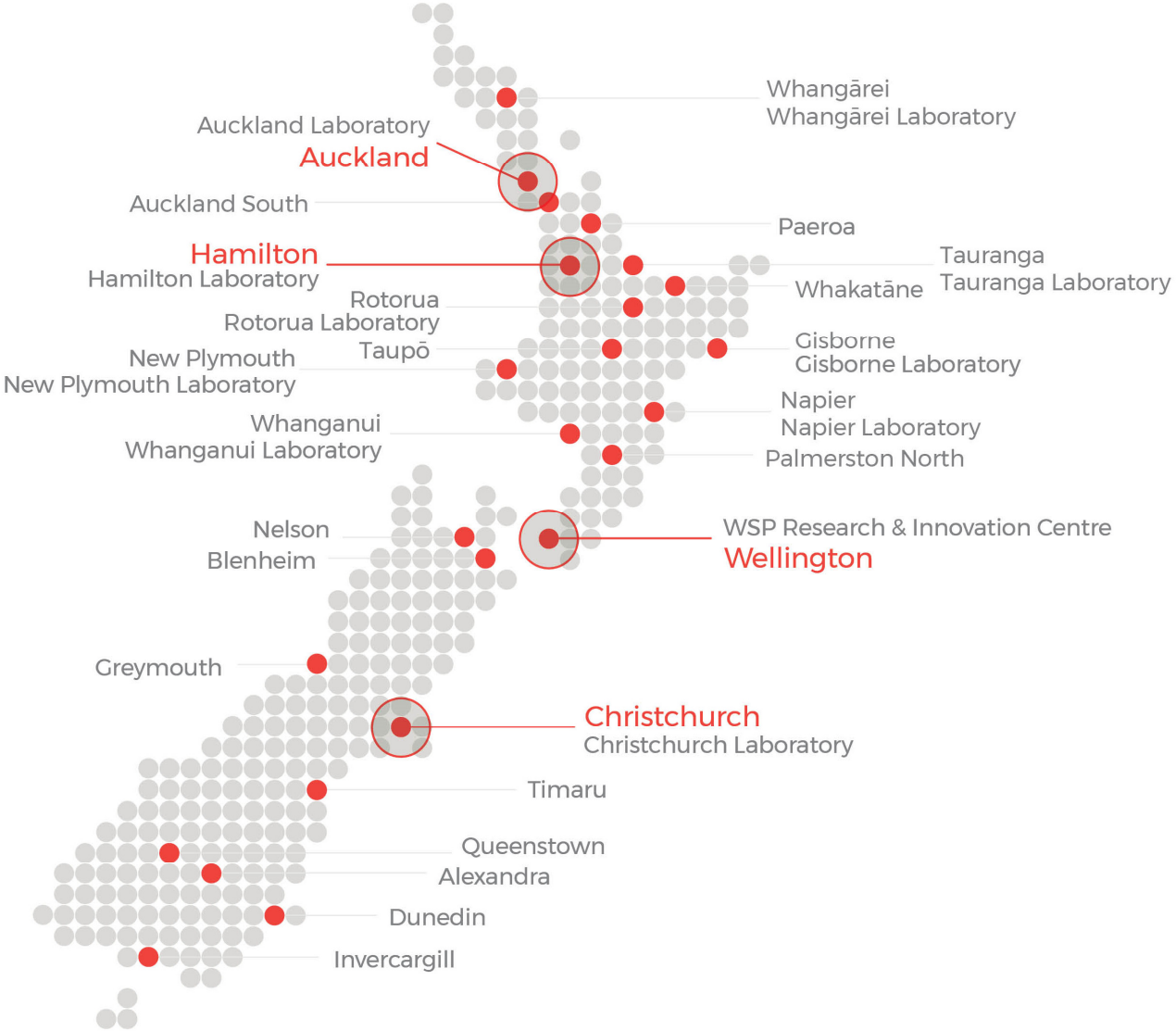
In response to the recent Aotearoa New Zealand Government Release of the 2025 Aquaculture Strategy, WSP presents this document to display the capabilities and resources available in assisting the government to achieve its goals.

Scope

This document outlines WSP's local and international capabilities in the fields of Aquaculture, Coastal, and Ports and Marine. The document is split into the following components:

- **WSP's local and international presence**
- **WSP's Aquacultural Capabilities**
- **Projects delivered by WSP**

This document highlights how WSP's capabilities can assist the Ministry of Primary Industries in achieving their three key outcomes and annual sales revenue of $3 billion by 2035.



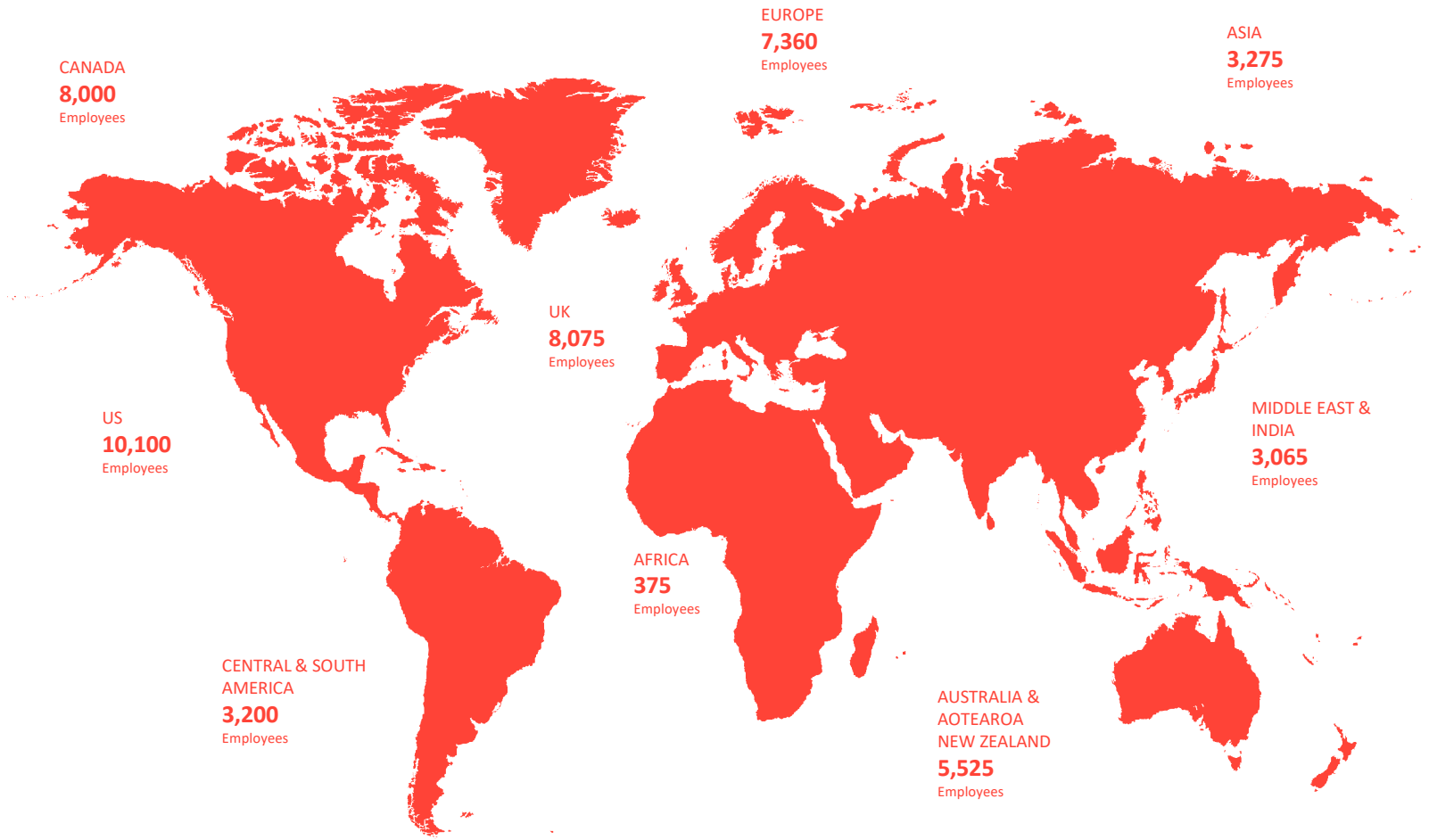
Local Experts Around Aotearoa

- ✓ 2300 Local Experts
- ✓ 151 years of pioneering
- ✓ 40 offices across Aotearoa New Zealand

Global Experts

WSP is a multi-disciplinary consultancy consisting of approximately 54,000 people located in over 500 offices all around the globe. WSP have offices located in Scotland, Ireland, Norway, Australia, Aotearoa New Zealand, Chile, USA and Canada, all of whom are critical players in the international salmon trade.

The WSP offices located in Patagonia, Chile and Norway have considerable focus and experience with major aquacultural projects.



Aquaculture Aotearoa New Zealand Strategy and WSP

Aquaculture Aotearoa New Zealand's Vision

Aotearoa New Zealand is globally recognised as a world-leader in sustainable and innovative aquaculture management across the value chain.

Aquaculture Aotearoa New Zealand's Goal

$3 billion in annual sales by 2035.

WSP's Role

WSP has a diverse portfolio of national and international staff with expertise in disciplines directly associated with aquaculture. This document covers our available technology and personnel who are able to assist the wider aquaculture industry in achieving their goals.

Major Aquaculture Areas in Aotearoa

Northland
Pacific oyster:
32% of total production

Auckland
Greenshell Mussel:
6% of total production
Pacific Oyster:
37% of total production

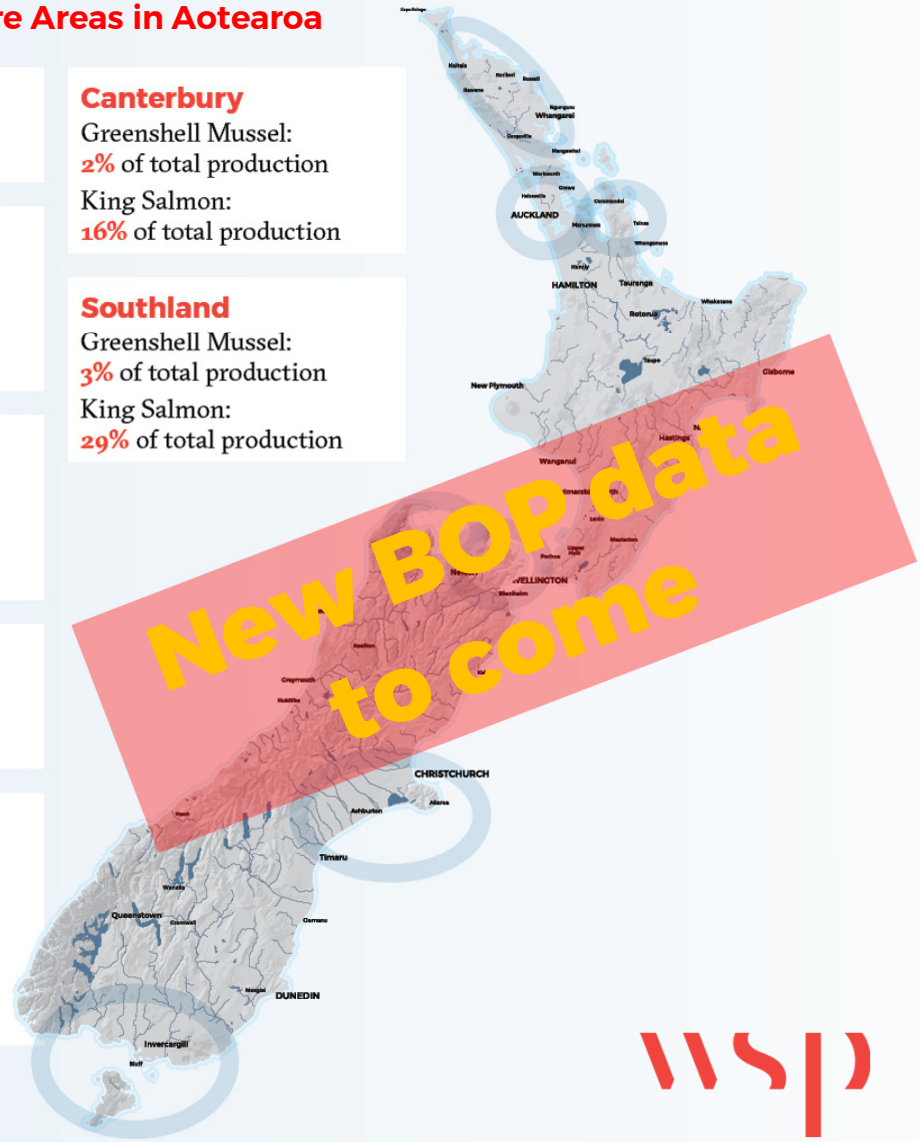
Coromandel
Greenshell Mussel:
30% of total production
Pacific Oyster:
24% of total production

Tasman & Golden Bays
Greenshell Mussel:
9% of total production

Marlborough
Greenshell Mussel:
50% of total production
King Salmon:
55% of total production
Pacific Oyster:
7% of total production

Canterbury
Greenshell Mussel:
2% of total production
King Salmon:
16% of total production

Southland
Greenshell Mussel:
3% of total production
King Salmon:
29% of total production



Māori Services

Hāpaitia te ara tika pūmau ai te rangatiratanga mō ngā uri whakatupu

At WSP we foster mana-enhancing partnerships by collaborating with Mana Whenua to support Māori environmental, economic and cultural wellbeing.

KŌRERO WHAKATAKI - Introduction

Our purpose is to build partnerships that enhance mana for future generations. Mana-enhancing partnerships are working relationships that increase the strength and success of all parties involved. These relationships recognise and respect Te Tiriti o Waitangi, and value the enhancement of Māori social, cultural, environmental and economic wellbeing.

Our services empower our clients to increase their understanding of Te Ao Māori, build cultural foundations across projects, and provide holistic and sustainable solutions which reduce project and business risks.

Iwi Engagement

Ō MĀTOU RATONGA – Our Services

Our team offers a range of services including rautaki (strategy) development, planning, Iwi engagement, and procurement.

- Client-side advisory and planning
- Short and long-term strategy development
- Identifying lessons learned and building new best practices
- Up-to-date understanding of Iwi priorities
- Iwi engagement, planning and facilitation
- Tailored training for project teams, general staff and leadership
- Relationship management
- Māori progression planning
- Testing projects against a general Mātauranga
- Māori (Māori knowledge)
- Policy development
- Tailored training for project teams, general staff and leadership
- Māori technical experts who can provide end-to-end support including site investigation and implementation
- Iwi, commercial and Crown entity governance
- Project management ranging from self-managed Iwi engagement to multi-disciplinary projects

Ō MĀTOU HĀTEPE – Our Process

Above is an overview of our process. This process is focused on relationships and can vary depending on your needs and the requirements of the project.

TŌ MĀTOU TĪMA
Our Team

The team including Iwi Engagement Specialists have a range of additional services which may be useful to Aquaculture Aotearoa New Zealand. These are summarised below and are not exclusive:

Engagement with Planning Team leaders

Engagement with Regional Business Managers

Engagement with Senior Environmental Specialists (Water)

Some of our previous work includes;
Working with MPI
Involvement with treaty settlements

Reginald Proffit
Director Pou Arataki Māori

Kumeroa Pihama
Pou Whanake – Technical Director Māori

Josiah Simmonds
Water and Waste Water Design Manager

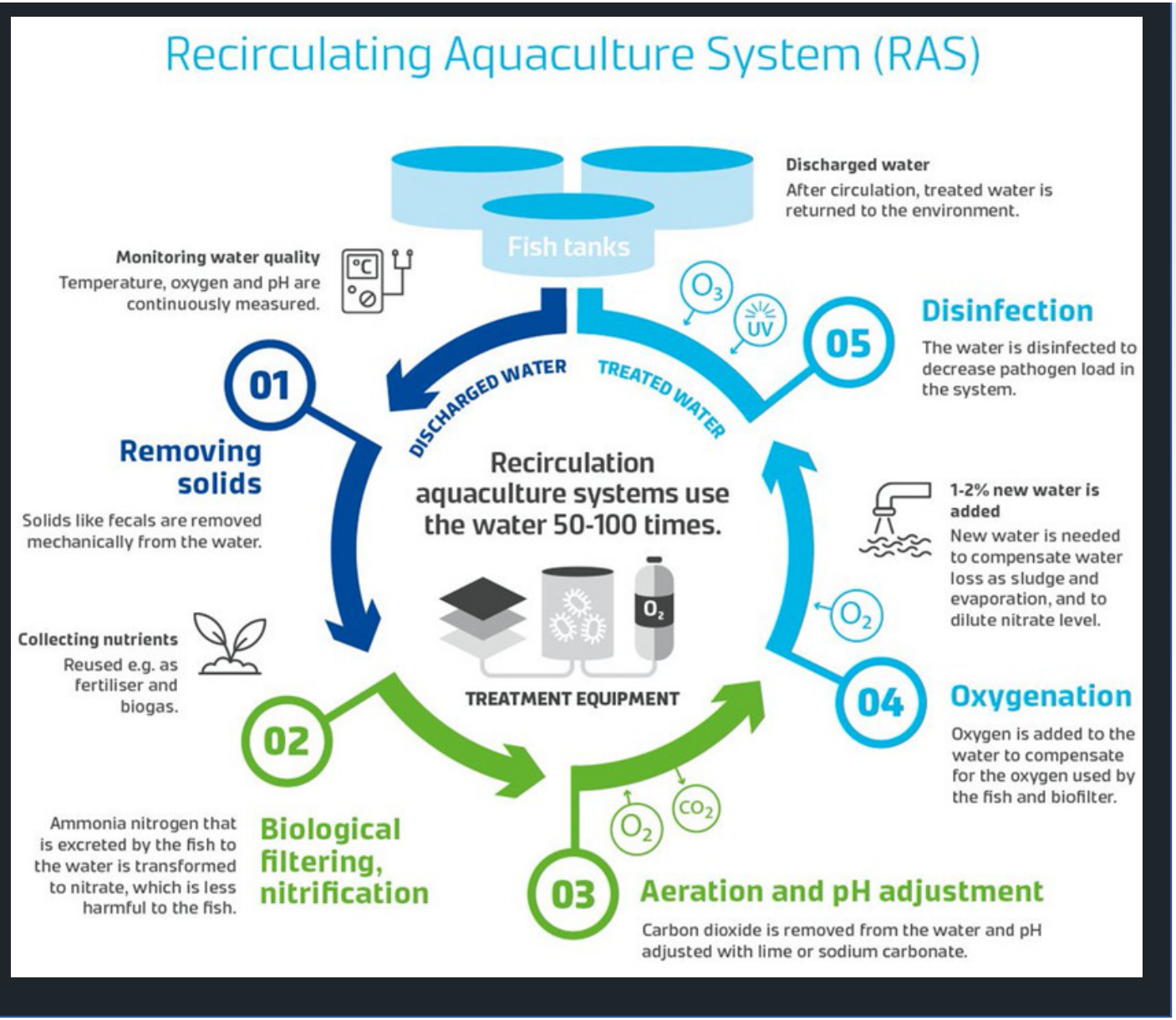
Jack Morris
Mātanga Māori

Ina Kara-France
Kaitohutohu Māori Matua

Sarai Mckay
Kaitohutohu Māori

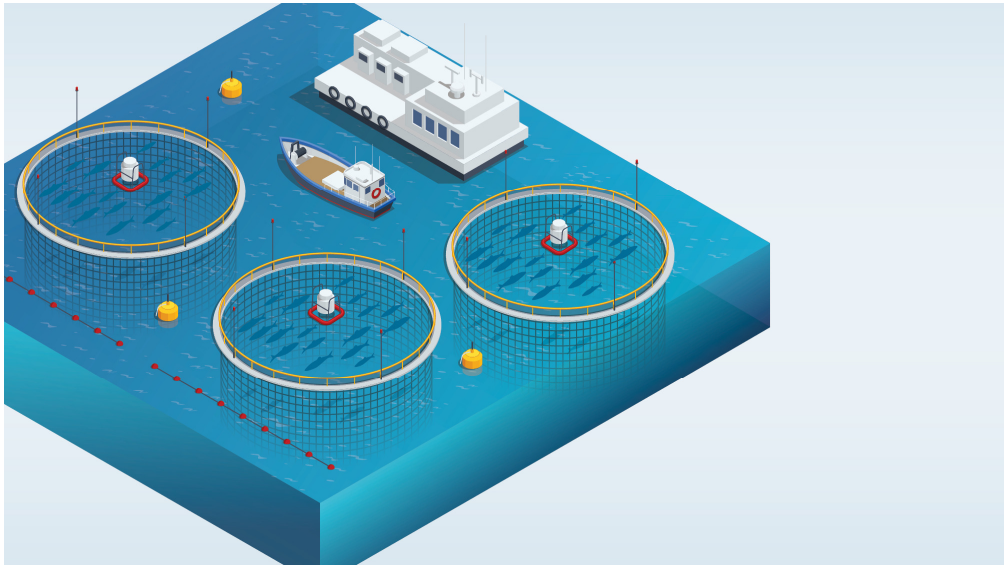
Maximising the value of existing farms through innovation

WSP has international experience in refurbishing and upgrading existing aquaculture farms to maximise output, efficiency and profit.



Extending into high value land-based aquaculture

WSP has experience in the design and project management of largescale aquaculture plants.



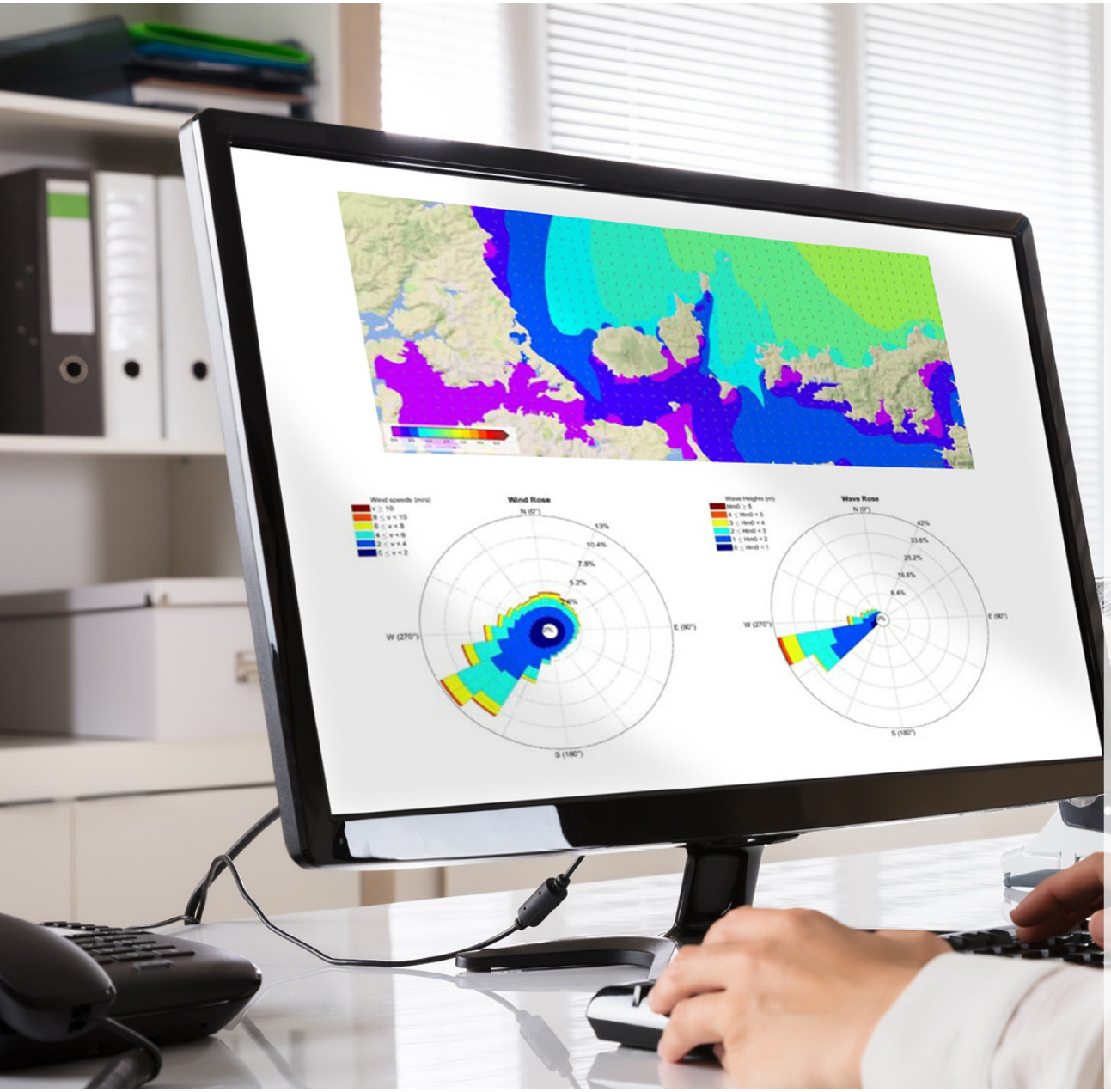
Open ocean aquaculture

Open Ocean Aquaculture is currently one of the most exciting but difficult challenges facing the international aquaculture industry.

WSP Aotearoa New Zealand has strong coastal, ports and marine teams. These teams bring strong experience in the design and project management of maritime structures and coastal modelling.

Coastal

WSP has a large team of Coastal and Maritime Engineers. The team brings a diverse range of skills and software with proven results.

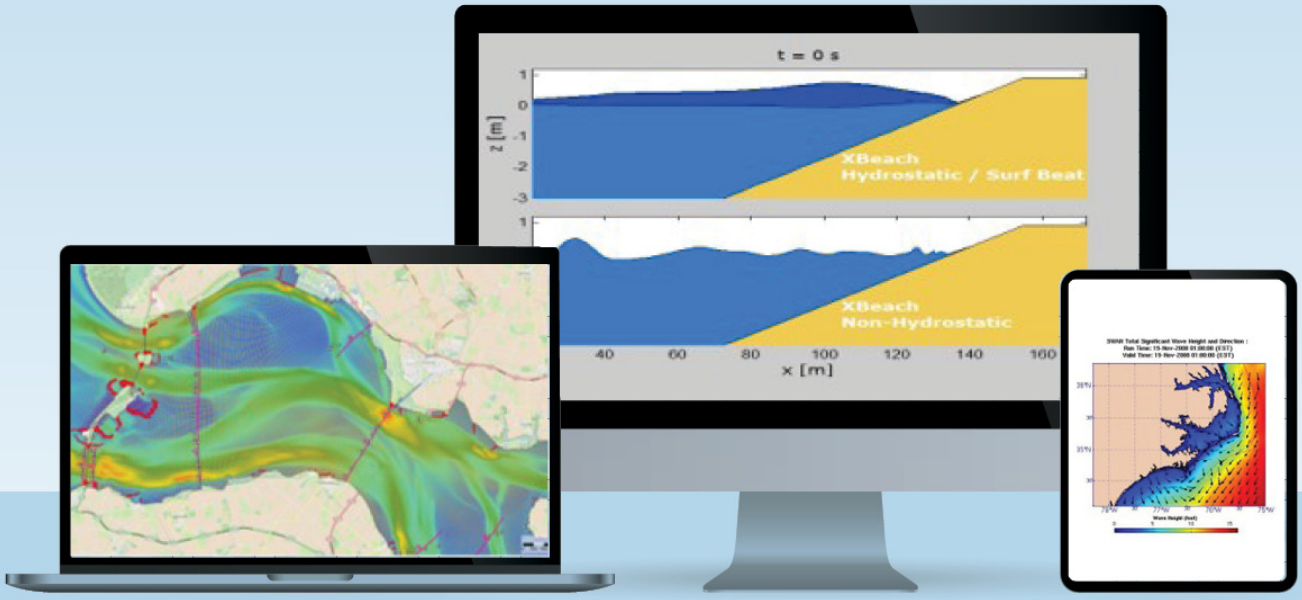


Coastal Numerical Modelling Software

We have access to, and experience in using, a large range of coastal numerical modelling platforms both in house and through our key partner organisations. The key packages we use are outlined to the left. We recommend the best software platform for each specific project or tailor our approach to the software used with our client organisation.

Numerical modelling software allows us to analyse a range of coastal parameters simulating ocean hydrodynamics, nearshore hydrodynamics, sediment transport, tidal inlet equilibrium tendency, water quality, storm impacts and the effects of vegetation (e.g. mangroves) on coastal dynamics.

- ✓ Delft3D suite
- ✓ Xbeach
- ✓ SWAN
- ✓ MIKE FLOOD, MIKE11
- ✓ Mike 21
- ✓ InfoWorks ICM & CS
- ✓ TuFLow
- ✓ Matlab/Python
- ✓ SCAPE

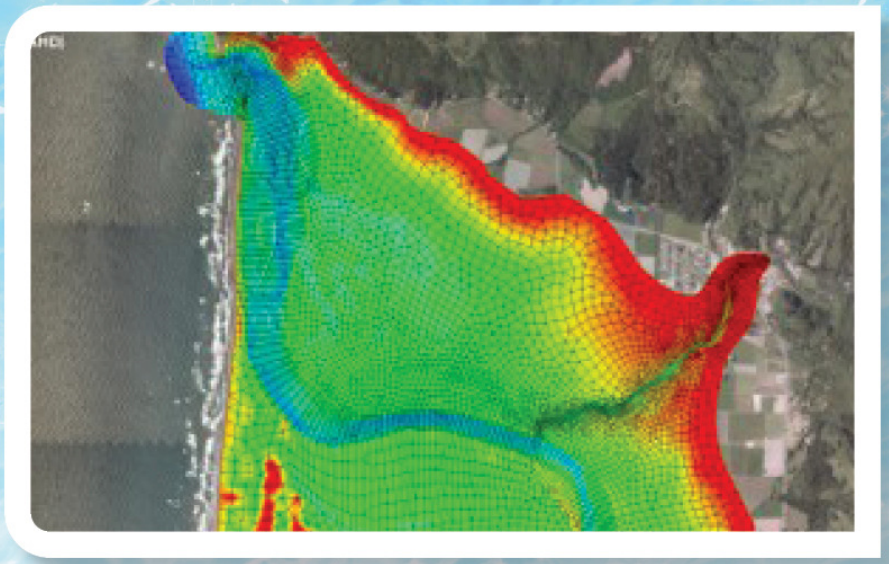


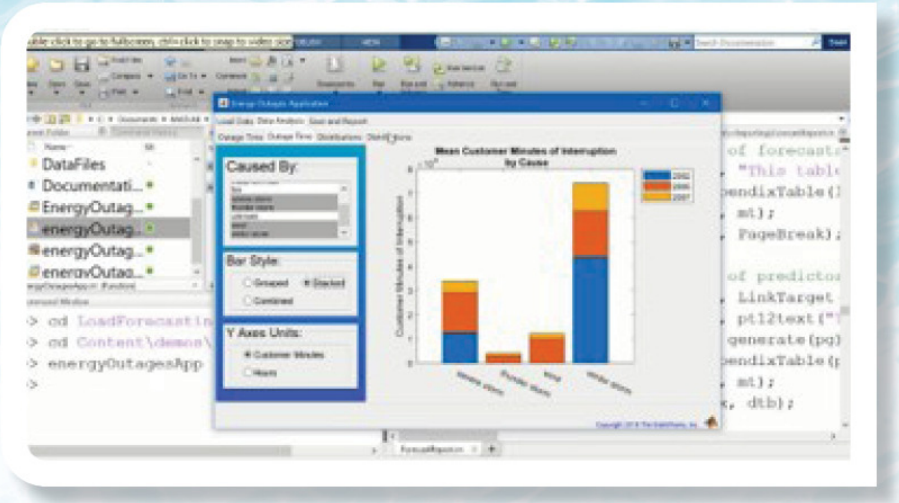
Coastal Numerical Modelling Software

Delft3D suite: Delft3D is an integrated modelling suite, which simulates two-dimensional (in either the horizontal or a vertical plane) and three-dimensional flow, sediment transport and morphology, waves, water quality and ecology and can handle the interactions between these processes.

Xbeach: XBeach is a depth-averaged two-dimensional process-based numerical model. The model is used for the computation of nearshore hydrodynamics and the morphodynamic response during storm-events, such as dune erosion, overwash and scour around buildings.

SWAN: SWAN is a third-generation wave model that computes random, short-crested wind-generated waves in coastal regions and inland waters.





Coastal Numerical Modelling Software

TuFlow: Fully supported Dhi software that enables us to model floods using both 1D and 2D flood simulation engines. Mike 11 simulates flow and water level, water quality and sediment transport in rivers, flood plains, irrigation canals, reservoirs and other inland water bodies,

Matlab/Python: Powerful scripting tools that allow us to work better with existing modelling software to optimise performance and undertake multiple runs. Statistical tools that help us to visualise uncertainty and handle data more efficiently than standard Microsoft tools.

SCAPE: A world leading in-house (and open source) coastal recession modelling tool that takes account of sea level rise.

Geospatial Tools

ESRI ArcGIS Online Collection

Environmental and coastal scientists use mobile devices to capture and edit relevant field data, which are instantly synchronised with the database. This information can be viewed by an office based team and the client.

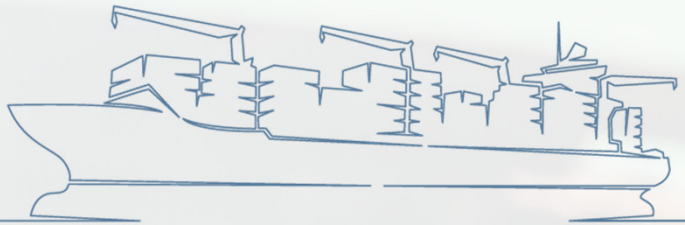
WSP Rapid Climate Change Adaption GIS Tools

Our Coastal team has generated GIS tools to assist with overtopping, inundations and coastal erosion risks.

WSP Safety GIS Tool

The geospatial team has the capability to design models and automate processes to assess and monitor safety around coastal and storm-water structures. Useful to identify areas of potential hazard around all assets and provide a safety rating based on contributing data and designated attributes

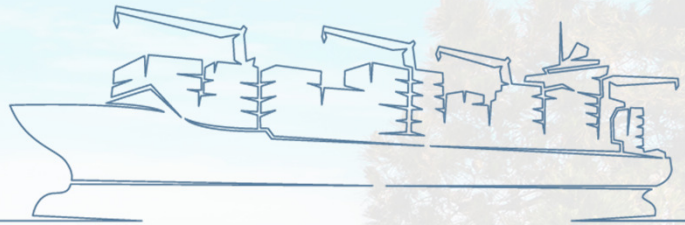
- ✓ ESRI ArcGIS Online Collection
- ✓ WSP Rapid Climate Change Adaption GIS Tools
- ✓ WSP Safety GIS Tool



Ports and Marine

WSP has a highly skilled International Ports and Marine team, conducting works for most of Aotearoa New Zealand's largest ports including:

Port of Tauranga, Lyttleton Port, CentrePort Wellington, Northport, PrimePort, Napier Port, South Port, Port Nelson, and Port Marlborough



Ports and Marine - Capabilities

Working in the coastal infrastructure environment, the WSP Ports and Marine team has strong capacity to assist Aquaculture Aotearoa New Zealand in achieving their goals. The figure on the left displays our key capabilities in the Maritime Environment.

Ports and Marine Projects

Port Marlborough

WSP has completed over 50 Projects over the last 15 years for Port Marlborough. These projects involved providing engineering services for works including wharfs, seawalls, dredging/berth pockets, sea bridges, walkways and many more. A selection of key projects are as follows:

Picton Ferry Precinct Development – WSP initiated a four stage container terminal and rail expansion, and are the current designers of the IREX new ferry terminals.

Lyttleton Port Company

WSP has a longstanding relationship with the Lyttleton Port Company with a range of infrastructure maintenance, new-build and operations projects. A few key project carried out are:

Container Terminal (CT) Rail Expansion (2009-2010) – WSP initiated a four stage container terminal and rail expansion.

CQ2 Container Terminal Wharf & Yard (2013 – 2015) – WSP undertook all aspects of engineering design and construction observation for this project. With significant time pressures due the resolution of LPC's insurance claim.

Centreport - Wellington

Location: Wellington
WSP Engagement: 2017 - Present
Projects:

Thorndon Container Wharf Temporary Earthquake Strengthening and CT Reconfiguration (2017-18)

Following the November 2016 Kaikōura Earthquake, WSP was engaged to provide engineering services in relation to securing the two ship to shore cranes on the heavily damaged Thorndon Container Wharf.

Kings Wharf Ground Improvements – Detailed Design (2018 – present)

Kings Wharf sustained extensive damage in the Kaikōura Earthquake, creating risks for Strait Shipping's operations. WSP created solutions to secure the berth in the short to medium term, while also maintaining operability of the wharf during construction.

Port Ground Resilience and Regeneration (2017 – ongoing)

After the devastation of the Kaikōura Earthquake, WSP were engaged to develop a strategy for regeneration of a resilient port, adding redundancy and improving robustness of critical infrastructure. Various different redevelopment concepts factoring in seismic performance, performance in tsunami, and adapting to climate change.

Planning

WSP has a team of Coastal and Maritime Engineers. The team brings a diverse range of skills and software with proven results.

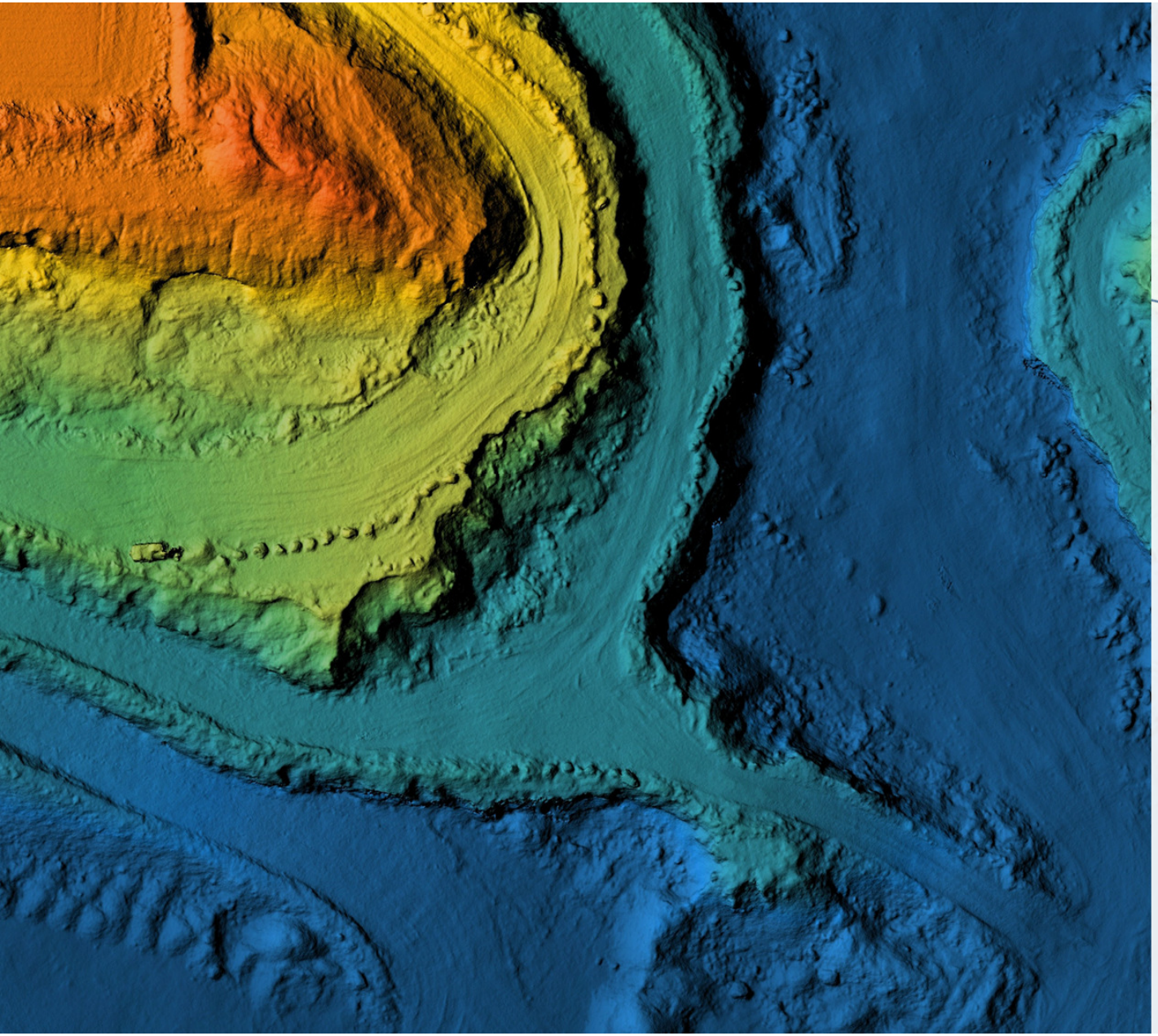
Planning

WSP has the largest planning department in Aotearoa New Zealand, our Aquaculture Specialists are able to offer a large variety of services to Aotearoa New Zealand's Aquaculture. Our Planners have had significant experience in:

- **Aquaculture Zoning and constraints**
- **Aquaculture legislation**
- **Aquaculture Deemed Coastal Permits review**
- **The Fisheries Act 1996**

We are also able to provide assistance with:

- **Scoping Proposals**
- **Assessment of Environmental Effects**
- **Stakeholder Engagement**
- **Resource Consents preparation**
- **Obtaining Resource Consents and Coastal Permits**
- **Undue Adverse Effects Applications**
- **Consent Compliance monitoring and advice**
- **Spatial Planning**



Other Services

As well as the services listed previously, WSP offers a diverse range of other skills and capabilities to assist Aotearoa New Zealand Aquaculture such as Geotechnical Engineering and Geographic Information System (GIS) Mapping.

Sustainability Reporting

WSP proactively engage sustainability in all services that are delivered and are recognised nationally for their frameworks and systems in place.

Global Sustainability Reporting is an example of a niche service that is offered by large multi-disciplinary companies like WSP. For every project, WSP assembles an experienced team of scientists, management consultants and engineers to accelerate and increase the impact of its work.

Sustainability Reporting

Outlined below are key deliverable services that the team are available to deliver:

1. Tailored sustainability frameworks - targets, measuring and reporting
2. Sustainability standards and certifications
3. High performing sustainable building analysis, design and operation
4. Low-carbon infrastructure procurement and lifecycle design-consideration of carbon use on projects
5. Climate risk and resilience studies

Our Sustainability team have experts who are recognised nationally and in particular cities such as Auckland and Christchurch shown below:

- Nationally: NZ Green Building Council, NZ Panels Group,
- Auckland: City Rail Link management and reporting-Excellent IS Rating
- Christchurch: Christchurch City Council low carbon systems

The team has a range of additional services which may be useful to Aotearoa New Zealand Aquaculture. These are summarised below and are not exclusive:

- Sustainable Infrastructure
- Climate Change Mitigation and Adaptation Strategies
- Life Cycle Analysis and Footprinting
- Regulatory Compliance

Asset Management

WSP is considered to be among the world's leading asset management providers.

Our capability encompasses both consultancy assignments and prime contractor roles ensuring that our advice is grounded and practical as well as strategic and visionary. We are truly global in our outlook, and actively combine the learnings and experience from our engagements in markets and jurisdictions around the world with local skills and knowledge.

Asset Management and Project Management

Outlined below are key deliverable services that the team are available to deliver. As part of our asset management services, we can provide you with expertise in

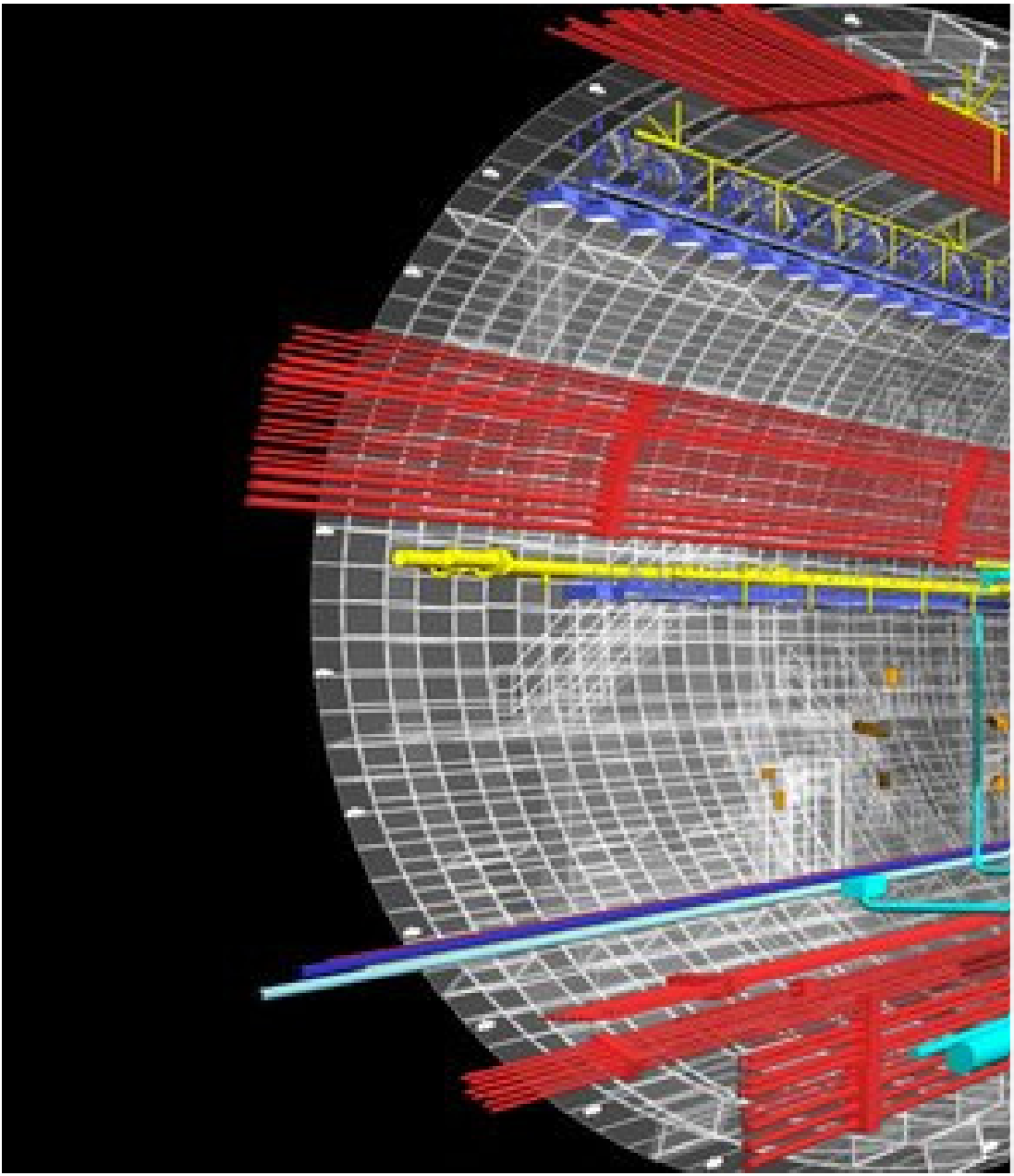
1. Policy, planning and strategic advice, resilience and risk management, level of service, certification
2. Condition Management – Condition assessment, materials specialists, renewals planning, valuations/ depreciation
3. Infrastructure Planning – 3 waters hydraulic modelling, master planning, whole of life cycle planning
4. Data Management – metadata standards, data collection, evidence-based decision making
5. Operations – training, demand management, auditing, O&M Contracts, network optimisation

The team has a range of additional services which may be useful to Aquaculture Aotearoa New Zealand. These are summarised below and are not exclusive:

- Project and contract management
- Procurement/Tender Specialists
- Risk management reviews
- Lifecycle modelling and planning
- NZ-wide certification for Quality, Environmental Management and Health & Safety

3D & 4D Building Design

The digital engineering team offer a range of services through 3D building design which can facilitate additional services and process designs. This includes design for pipes and ducts which are essential for industrial buildings. Advancements and utilisation of 4D design are also underway to ensure WSP maintains its position as a market leader.



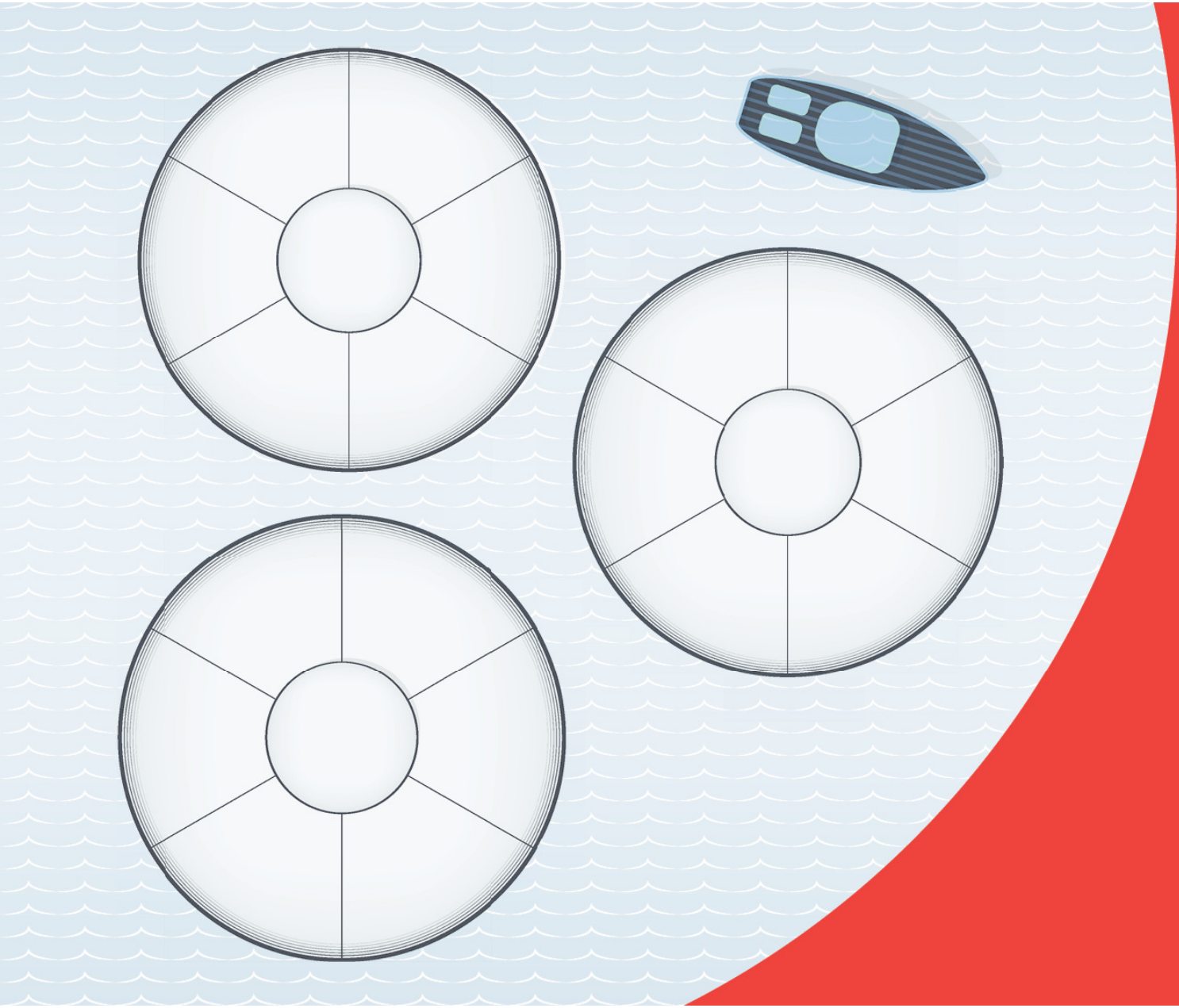
3D & 4D Building Design

Outlined below are key deliverable services that the team are available to deliver:

1. Model Element Authoring - Creating BIM Models
2. Common Data Environment - advice, setup and management
3. Pre- and post-contract BIM Execution Plans
4. Visualisation - (Virtual Reality, Augmented Reality, Stakeholder Engagement)
5. Management of laser scanning and scan to BIM procurement process

The team has a range of additional services which may be useful to Aquaculture Aotearoa New Zealand. These are summarised below and are not conclusive:

- Extraction, conversion & collation of graphical & non-graphical information
- Transfer of data into an identified GIS system
- Model audit, review and change comparison
- Coordination reporting and trending
- Integration of design information into immersive virtual reality environments
- Visualisation of potential change impact
- 4D sequencing for health and safety and site briefing



Our Portfolio

Tekapo Salmon Farm project

Client: Mount Cook Alpine Salmon Ltd

Location: Twizel, Aotearoa New Zealand

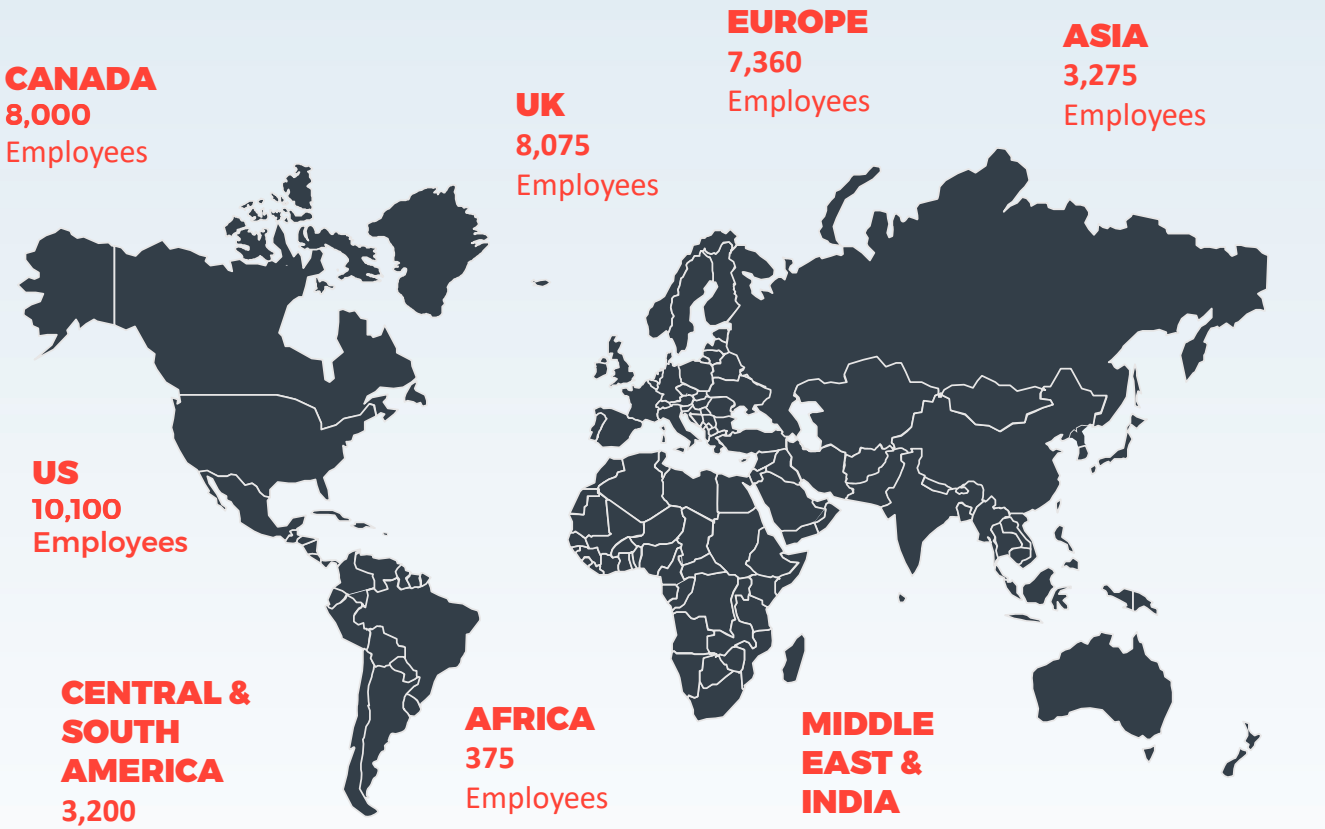
Project Period: 2001 - present

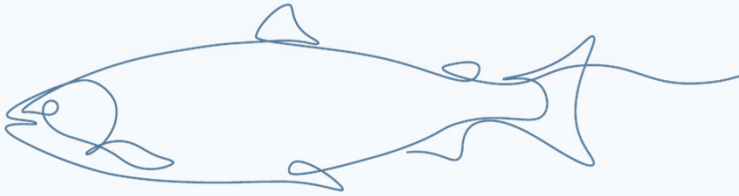
Description

- Expansion and development of existing salmon farms
- Construction of 4 No. new raft enclosures
- Doubling of existing salmon farming capacity

Services Delivered

- Structural design
- Geotechnical investigation
- Surveying





International Aquaculture Experience

Having offices all around the globe and 52,000 staff gives WSP a massive range of capabilities. The WSP offices in both Norway and Chile have considerable experience in the Aquaculture industry for some of the biggest clients in the global trade.

- Business Case Analysis
- Process and Plant Strategy Development and Master Planning
- Pre-feasibility and Feasibility Studies
- Simulation and Modeling Services
- Design of Hatcheries, Freshwater Phase, Seawater Phase (at sea cages)
- Processing Plants (primary and secondary processing)
- Layout Development including Food Grade Facilities and Production Process
- Process Design Plant and Energy Optimization
- Technical Documentation and Procurement Processes Process and Utilities Automation,
- Instrumentation and Control Design Phase Full Engineering
- Full Project and Construction Management Construction Phase Support, Start-up and Commissioning Support

Transfer Center Pargua

Client: Los Fiordos/AquaChile
Location: Los Lagos Region, Chile
Capacity: 19 million smolt @ 150 g per year
Our Services: Master Plan, Basic and Detailed Engineering (Process, Civil & Structural, Hydraulic, Mechanical & Piping, Electrical, Automation), Environmental Services and Permitting, Procurement Process of Equipment, Project and Construction Management, Technical Inspection, Commissioning
BIM model including Process Equipment, Civil & Structural and MEP
Project state: Finished in 2019

- The Transfer Center Pargua is a 40-tanks salmon hatchery to produce 19 million smolt per year of about 150 g each.
- WSP was commissioned to design a modular and replicable individual recirculation system.. These 40 tanks require a flow of 100 litres per second of water which is collected from deep freshwater wells and deep seawater wells.
- The tanks are equipped with individual recirculation aquaculture systems (iRAS) which were designed by WSP.
- The commission for the design of the individual recirculation system tanks was a pioneering concept in collaboration with the client and then successfully implemented.
- WSP developed the necessary calculation and engineering (civil & structural, hydraulic, biological parameter) for the design of the whole system:
    - •Tanks
    - •Biofilter
    - •Pumps
    - •Degassing tower

Salmon Feed Mill Plant

Client: Skretting
Location: Los Lagos Region, Chile
Capacity: 30 tonne/h of finished product

- Feed Mill plant for the production of oil coated extruded pellet
- WSP Services
  - Concept, basic and detail engineering (full project design)
  - Technical documentation and procurement of process equipment
  - Process and utilities automation
  - Project management
  - Construction management
  - Start-up support and commissioning.

Fishmeal and Oil Factory

Client: Karmsund Protein
Location: Karmøy, Norway
Capacity: 50 tonne/h of raw material

- New fishmeal and oil factory.
- Start-up Q1 2018
- WSP Services
  - Project management
  - Emissions applications
  - Follow-up contact County Governor an environment Directorate
  - Process consultancy

Hollenberg Hatchery Expansion Project

Client: AquaChile

Location: Puerto Natales, Magallanes, Chile

Capacity: 8 MM smolt per year

Our Services: Individual RAS design for the Plant expansion phase, Detailed Engineering of MEP & Civil Works, Construction Management, Technical Inspection, Environmental Management.

Project state: commissioning planned for April 2021

Hollenberg hatchery is a RAS facility located in the extreme south region of Chile.

This project considers the increase of the production capacity by 50% and has an added goal of allowing the space and process infrastructure to retain the fish before the transferring process into sea cages while the sea water temperature is below 6 degrees Celsius (may-aug).

WSP scope included the PM, Procurement and Engineering (Concept, Basic and Detail) of the entire Project including the design of the Individual RAS system, civil and structural Works, MEP, Automation and design and implementation od the SCADA control and supervision system.

WSP also took care of the design of the utilities expansion including process water treatment, wastewater treatment, heating system, oxygen and feed distribution systems.

Salmon Processing Plant - Quellon

Client: Los Fiordos/AquaChile

Location: Los Lagos Region, Chile

Capacity: 140,000 tonne per year Pacific and Atlantic salmon

Process: Primary and Secondary Processes including filleting, pin-bonning, value added, IQF, HG Freezing, Packing and Labeling

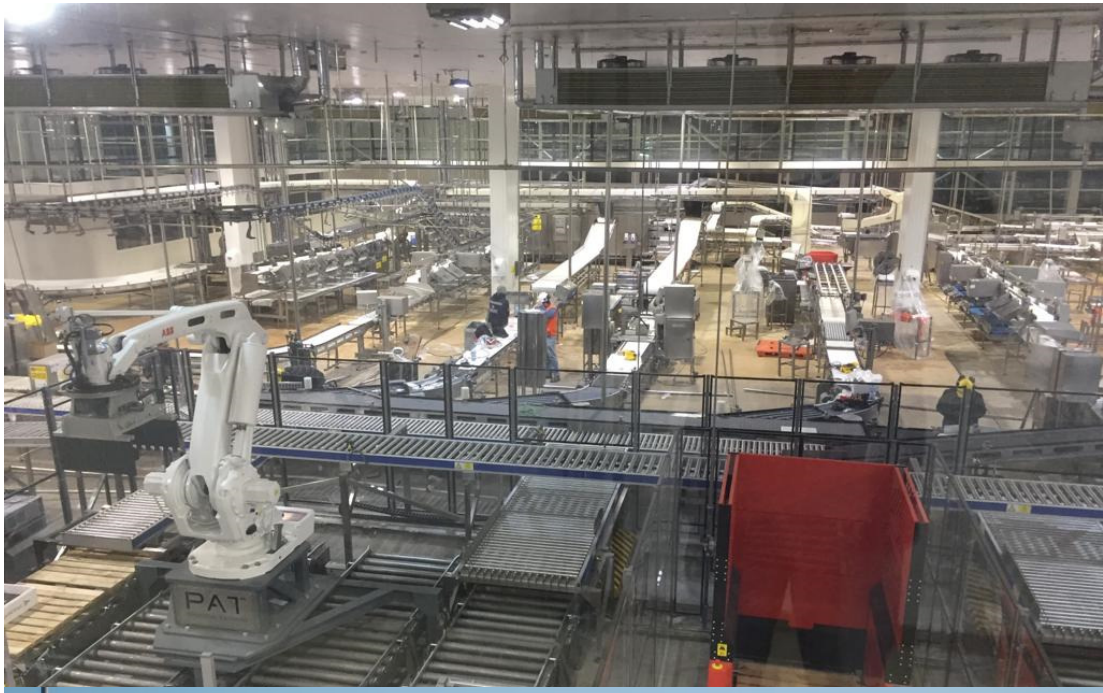
The processing plant has been in operation since 2001 and all the salmon is processed in pre-rigor state, which guarantees the freshness and quality of the products.

It is the only salmon processing plant in Chile with an inland fish stockpile tank technology that allows for the control of environmental and sanitary variables.

WSP has participate in the original project of the plant and in the extension project. Nowadays (2019-20) the Quellon processing plant is the largest one in the world and employs about 1,000 people.

WSP Services

- Basic and Detail Engineering
- Project Management
- Procurement
- Contract Management
- Contracting Support
- Commissioning and Start-up
- Implementation of Environmental Management
- Safety and Food Safety



Osan Salmon Hatchery

Client: Midt-Norsk Havbruk AS

Location: Osan, Naroy, Central Norway

Project Period: 2001 - Completed late 2014

Description

- Expansion and development of a salmon hatchery.
- Further development of fish farms for production of 6.5 million smolt per year.

Services Delivered:

- Regulatory plan with assessment of infrastructure, landscaping etc.

Troms Stamfiskstasjon – Troms salmon/broodstock-production plant

Client: Salmar

Location: Senja, Troms, Northern Norway

Project Period: 2015 - 2017

Description

- Construction of the worlds biggest salmon hatchery for a production of 15 million smolt per year.
- Construction of plant using recycled technology (RAS)
- Total project value approximately 600 million NOK (100 million NZD)

Services Delivered:

- Project and Construction Management
- Progress Control and Planning

Fish by-product processing

Client: Camanchaca

Location: Los Lagos Region, Chile

Capacity: 40,000 tonne per year fish meal and 3,200 tonne per year fish oil

The project goal is to process whole fish or fish by-products obtaining fish-meal and fish-oil.

The project is currently in design phase

WSP Services

- Concept, Basic and Detail engineering (full project design)
- Layout development
- Technical documentation and procurement of main process equipment
- Project Management
- Construction Management
- Cost Control
- Start-up support and commissioning

Kråkøy Slakteri AS

Client: Kråkøy lakselakteri

Location: Roan, Central Norway

Project Period: 2016 - present

Description

- Project management for construction of a new salmon processing plant capable of 300 tonnes per shift.
- Total project value approximately 160 million NOK (26 million NZD)

Services Delivered:

- Project Management
- Process Management

Marine Harvest, Ulvan

Client: Marine Harvest

Location: Ulvan, Hitra, Norway

Project Period: 2015 - 2017

Description

- Modification and streamlining of Marine Harvest's salmon processing plant

Services Delivered:

- Project Management
- Process Management

Nova Sea, Lovund

Client: Nova Sea

Location: Ulvan, Hitra, Norway

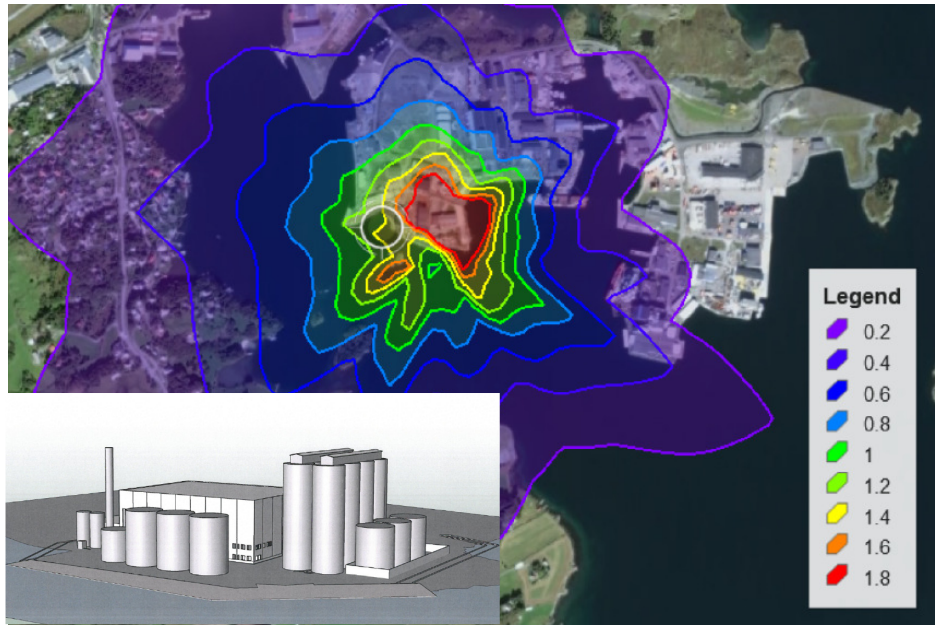
Project Period: 2006 - 2007

Description

- Project management and process analysis of a salmon production plant.
- Simulation of process to increase understanding.
- Mapping the existing process, modelling and evaluation measures for efficiency and production.
- Hygiene and product quality.
- Optimization of layout.

Services Delivered

- Project Management
- Process Management, support SINTEF



Karmsmund Protein AS

Client: Karmsmund Protein

Location: Karmsund, Norway

Project Period: 2016 - 2018

Description

- New fishmeal and oil factory

Services Delivered:

- Project Management
- Emissions applications
- Process consultancy

Nortura Malvik

Client: Nortura

Location: Malvik, Central Norway

Project Period: 2014 - 2017

Description

- Project management for the total project including construction of a new distribution centre for Nortura's animal processing plant.
- Project Cost approximately 144 million NOK (20 million NZD).
- All works from feasibility study to finish and commissioned factory including a cold store and supercool system.

Services Delivered

- Project and Construction Management
- Progress control and planning
- Contract Management

Marine Harvest, Ulvan

Client: Nils Williksen AS

Location: Vikna, Central Norway

Project Period: 2014

Description

- Project management for the modification of the existing Salmon Processing Plant

Services Delivered

- Project Management
- Process Management

Salmon Feed Mill Plant

Client: Skretting

Location: Los Lagos Region, Chile

Capacity: 30 tonne/h of finished product

- Feed Mill plant for the production of oil coated extruded pellet
- WSP Services
  - Concept, basic and detail engineering (full project design)
  - Technical documentation and procurement of process equipment
  - Process and utilities automation
  - Project management
  - Construction management
  - Start-up support and commissioning.

Fishmeal and Oil Factory

Client: Karmsund Protein

Location: Karmøy, Norway

Capacity: 50 tonne/h of raw material

- New fishmeal and oil factory.
- Start-up Q1 2018
- WSP Services
  - Project management
  - Emissions applications
  - Follow-up contact County Governor an environment Directorate
  - Process consultancy

Scanbio Ingredients AS

Client: ScanBio

Location: Bjugn Norway

Project Period: 2017 - present

Description

- Upgrading and capacity increase for production of a protein concentrate and fish oil at the factory.
- Capacity increase of meal process train.

Services Delivered:

- Assistant project management
- Process consulting
- Progress control and planning
- Contracting and Contract Management
- Quality management and certification

Akva Group

Client: Akva Group

Location: Vikna, Central Norway

Project Period: 2012 - 2015

Description

- Product development of Photofish. A tool for product control and analysis of fish quality consisting of a measuring system and the associated software and services
- SYSPAC: Leadership of a feasibility study and pre-project preparation and decision-making forming the basis for the development of infrastructure for framed premises
- NGNC: Management of feasibility study and pre-project preparation of decision-making basis for development of solutions for cleaning of farms

Services Delivered

- Project Management
- Process Management

Other Example Projects – Fish feed and protein production

BioMar Karmøy – fish feed

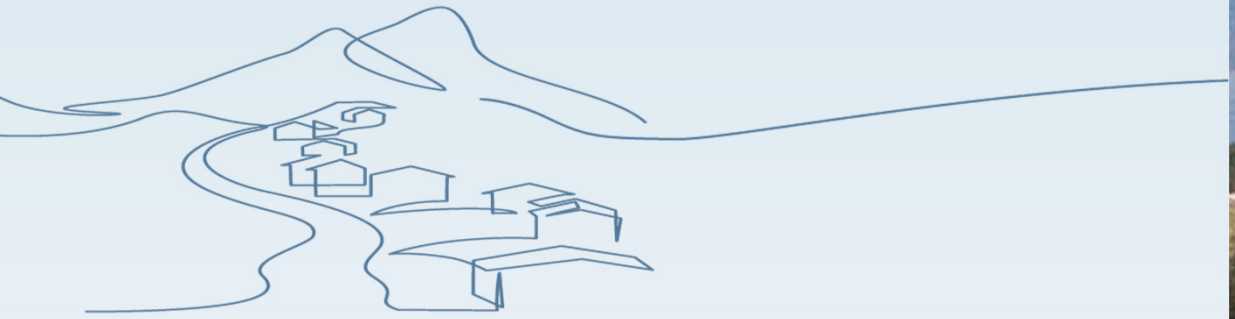
BioMar Myre – fish feed

Scanbio Ingredients, Bjugn

Skretting; Averøy, fish feed Stokmarknes - Stavanger

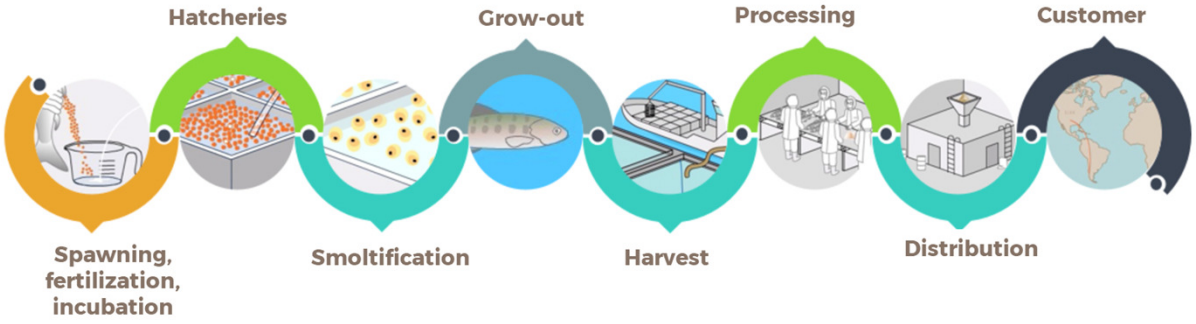
Marine Harvest Valset (Mowi) Fish Feed

Hofseth Biocare

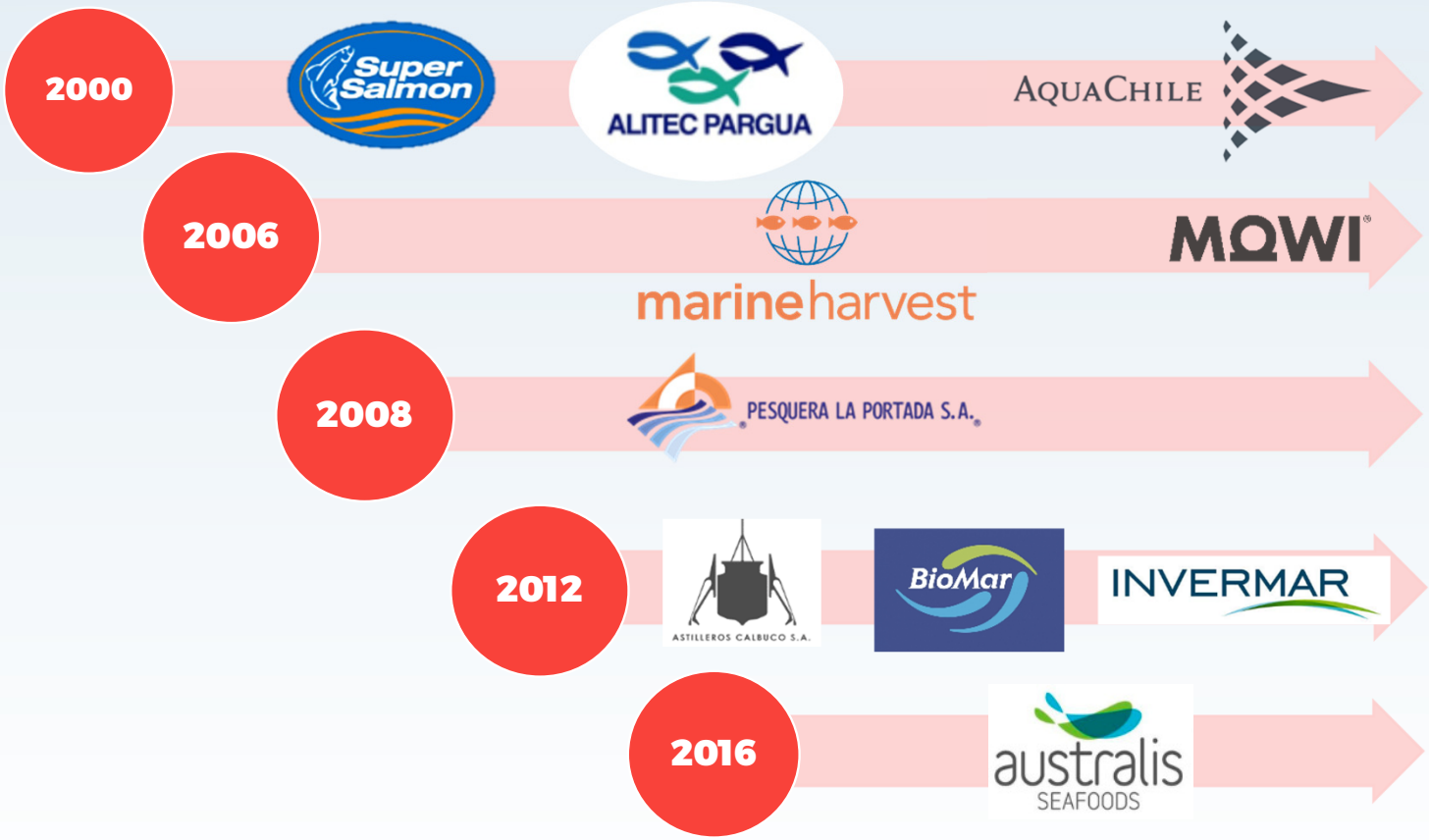


Chile

WSP Chile has a significant contribution towards the Chilean Aquaculture Sector. WSP offers the full process service package from master planning, full design through to project management, operational and environmental monitoring.

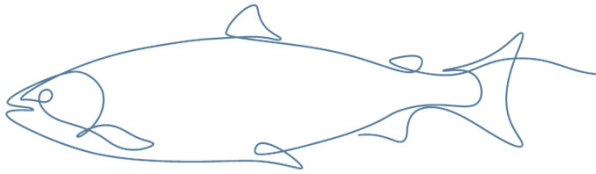


WSP Chile Aquacultural Relations



- WSP Chile has a long-lasting relationship with several key players within the Global Salmon Industry.
- WSP Chile does significant amounts of work for key aquaculture players with approximately 52% of business coming from clients within the sector.
- The key services provided are: environmental advice to ensure compliance in every stage of the production cycle and environmental assessment in both the project development and operational phases.

Our main clients



Alastair Wiffen

Principal Contact for NZ Aquaculture

Alastair.Wiffen@wsp.com Mobile 0275 943336

Senior Project Manager

Alastair is a Senior Project Manager with 34 year's varied experience in construction. He has headed the Te Tau Ihu (Top of the South) Primary Industry team based in Nelson since 2011.

Relevant Experience

Senior Project Manager for a range of projects across New Zealand including Whangarei Animal Welfare Shelter Design, Woolley Dairy Farms Environment Court Compliance upgrade, Trafalgar Park Construction upgrade.

General Manager of a building construction and civil construction companies.

Client Relationship Manager for Port Nelson Ltd, Gibbons Holdings,

Wellington Regional Health and Safety Manager 2013-2015

Winner Opus International Global Health and Safety Award

Winner Opus Global Business Development Award

Winner Opus Global Sustainability Award

Winner Opus Global Innovation Award

Kumeroa Pihama

Pou Whanake – Technical Director Māori

Developed in the finance industry, Kumeroa has extensive portfolio and customer relationship management experience. Since joining WSP he has lead Iwi engagement on multiple projects and continues to do so. Kumeroa has established himself and his discipline firmly within WSP leadership while providing pan business and client mentoring.

Relevant Experience

MFE Mana O Te Wai Delivery, July 2021: MFE, Iwi and Council role out facilitator.

Bulk water storage feasibility stage 1, 2020: Waikato-Tainui. Client relationship manager

District plan change, January 2020 – August 2021: Author the Cultural sites of significance chapter of plan change 9, Hamilton City Council

Waipa DC Water Renewal, Waipa DC, (Dec 2019 – July 2020): Iwi engagement lead

Land utilisation projects, 2020: Aorangi Whānau Trust, TTKS Whānau Trust. Iwi Engagement Specialist

Corrections Social Impacts Assessment, 2019: Department of Corrections, Iwi Engagement Specialist.

Chris Spencer

Principal Coastal Engineer

Chris is a Principal Coastal Engineer and has had roles that have encompassed all aspects of complex construction and engineering, exploration, data processing and management, research, scientific, environmental, infrastructure, logistics, maritime, hydrographic, marine, offshore and onshore programme development: from the conceptual to successful delivery.

Relevant Experience

Aquaculture, Marine Spatial Plan and Marine Farming Strategy, Opotiki, Bay of Plenty, Aotearoa New Zealand (2019 - 2021): WHAKATŌHEA MAORI TRUST BOARD, Consultant - Navatt Ltd

Consultant Aquaculture Comm Mngr (18-mth tenure as a part of the MBIEPG-funding process) in developing Aotearoa New Zealand's premier open ocean aquaculture site (~12,000 Ha)

Ōpōtiki Harbour Development (Te Ara o Toi Moana), including the Marine Industrial Zone (MIZ), Ōpōtiki, Bay of Plenty, Aotearoa New Zealand (2019 - 2021): ŌPŌTIKI DISTRICT COUNCIL, Consultant - Navatt Ltd

Consultant and iwi liaison for the renewed business plan and funding application for the Ōpōtiki Harbour Development (Te Ara o Toi Moana), including the Marine Industrial Zone (MIZ)

Kylie Galbraith

Senior Planner

Kylie is a Senior Planner for WSP located within the Christchurch Office. Kylie has extensive knowledge of Aotearoa New Zealand aquaculture working with Local Government and Government Industries.

Kylie attended the 2019 Cawthron Open Ocean Aquaculture Symposium, extending the breadth of her aquaculture knowledge.

Relevant Experience

2018 – Ministry of Primary Industry (MPI). Implementation scoping assessment for a proposed National Environmental Standard for Marine Aquaculture.

2013 - 14 – Southland Regional Council (SRC). Instigated and Project Managed high-level constraints mapping to identify what aquaculture may be possible in Southland.

2005 - 15 – SRC and MPI. Advisor for Aquacultural Legislation Amendments.

2005 – 15 SRC. Planning policy, coastal permits, wharves and mooring approvals in the Southland Region.

Ramon Ortuzar

WSP Global Market Leader - Food and Beverage sector

Ramon heads the WSP global food and beverage sector with a specialisation in aquaculture. He is based in Santiago Chile and has concentrated his career in the Industrial sector with specialization in the F&B and Mass Consumer Products sector. Ramon previously worked for Becca NZ, and has worked around the world mainly in process design sector.

Relevant Experience

Inland production and processing plant for Salmon – whole production cycle inland, 2019. Business Case Analysis, Concept Design and Basic Design. Role: Project Manager and Design Manager for the Primary and Secondary Processing Unit. Client: Blue Gardens.

Salmon Processing Plan Process Modernization Project, Chiloe, 2018-2019. Role: Process Design Leader. Master Planning, Capex study, Execution Planning, Main Process Equipment Procurement. Client: AquaChile.

Mussels Production Facility Expansion Project, Dalcahue, Chile, 2014. Role: Job Manager and Process Design Leader. Client: Sudmaris.

Brewery Plant Relocation Project. Role: Processing Equipment Relocation Capex study. Client: Lion-Nathan Brewery, NZ, 2007-8.

Jack Morris

Mātanga Māori - Tumuaki (Technical Principal - Māori)

Jack is the Aotearoa Māori technical principal, and brings a wealth of Iwi Commercial, planning acumen to our NZ aquaculture team. Jack has a background in Iwi/hāpu Resource Management Plans, was previously Manager of Treaty relations for Wellington City Council. His technical skills include Iwi commercial investment /Kaupapa Maori investment frameworks and Iwi governance with a strong background in change management and asset management.

He has a detailed understanding of the 1992 Māori Fisheries Settlement Act and the 2004 Aquaculture Claims Settlement Act 2004

Relevant Experience

-Raukawa ki te Tonga Asset Holding Co - CEO: Oversaw the development of Raukawa ki te Tonga Asset Holding Co Investment Governance Policy and Diversified Investment.

- Treaty of Waitangi Fisheries Commission /Te Ohu Kai Moana, Policy Analyst: Responsible for development of fisheries allocation model and implementation of Iwi Governance Readiness.

-Te Wānanga O Raukawa Foundation - CEO: Oversaw the execution of a $27.5m investment strategy in accordance with SIPO and kaupapa tuku iho values.

-Centerport - Asset Manager: Completed the development of an overall asset management

-Callaghan Innovation - Transition Manager: Completion of 2022 Callaghan Innovation - Building Property AM Plans

Natasha Berkett

Work Group Manager Earth & Environment; Principal Planner

Natasha is a Principal Planner located in WSP's Nelson office. Natasha has an excellent understanding of Te Tau Ihu aquaculture industry, having worked for the Cawthron Institute for 10 years on many aquaculture – related projects. Natasha also worked as a consent planner for Hawke's Bay Regional Council where she was involved in consenting activities in the CMA.

Relevant Experience

1994 – 1997 – Cawthron Institute – Research into marine Biotoxins

2009 – 2010 - Napier Mussels Limited – Staged development of a 2465 ha mussel farm in Hawke Bay. Compliance with conditions of consent.

2012 – New Zealand King Salmon – Application for water space in the Marlborough Sounds. Project-managed Cawthron's technical and planning input into NZKS's Board of Inquiry application.

2013 – Auckland Council - Harmful Aquatic Organisms - Recommendations for the Auckland Unitary Plan. Technical Report

2014 – Massey University – Research into a collaborative planning framework using an aquaculture consent application as a case study.

2015 – MBIE Envirolink - Guiding coastal and marine resource management: The Coastal Special Interest Group Research Strategy.

Lewis Thomas

Team Leader – Principal Civil and Structures Engineer

Lewis is Team Leader – Principal Civil and Structures Engineer and heads the team responsible for delivery of the MT Cook Alpine Salmon Project.

Relevant Experience

2017 - CentrePort Ground Resilience Improvements, Wellington. Design Manager

2013 – Port Taranaki. Port Taranaki Natural Hazard Evaluation, Senior Geotechnical Engineer.

2014-15 – Lyttleton Port of Christchurch. Oil Berth Reconstruction Concepts, Senior Geotechnical Engineer

2015 – Royal Southern Yacht Club. Design of a lattice seawall, Principal Geotechnical Engineer

Maren Lyngsgaard (Denmark)

Aquaculture Projects Leader –Marine biologist

Maren is a marine biologist with a PhD in microalgae dynamics. She has 7 years of experience with sustainable production of blue mussels and has 13 years of experience with ecosystem dynamics. She has international and national experience within sustainable and future proof aquaculture.

Relevant Experience

Baltic Blue Growth project where six countries around the Baltic sea collaborated on examination and demonstration of cultivating blue mussels to produce feed and reduce the nutrient load in the Baltid Sea.
Inprofeed project, where the focus is on establishment of a production line of blue mussels for feed and food with environmental benefits such as clear water and higher biodiversity within the farm area.
Droneboat to protect mussel farm production from foraging eider ducks. Here a self sailing droneboat is developed to patrol the farm area and scare off eider ducks, as these are a challenge to many mussel farmers and cause of lost income.
Environmental surveys related to the ASC certification of rainbow trout production in open cages.

Miguel Baeza (Chile)

Head of Dept Mechanical Eng - Project Manager, Industry Sector

Electronics Engineer with 25 years of experience working in diverse engineering projects, mainly dedicated to the salmon industry.

The initial activities included the development of projects in the disciplines of Automation, Electricity and Industrial Refrigeration. Since 2000 has assumed management functions in industrial projects.

With a global vision of the projects and knowledge in various Engineering disciplines, Miguel can lead professionals from different specialties to carry out one or all stages of a project, from its conceptual definition to its construction and commissioning.

Relevant Experience

Serving as Project Manager (2003-2020) in charge of lead design and implementation of several aquaculture projects, including complete new open flow and recirculation fish farms; extension and conversions of facilities and technological improvements. Client: AquaChile,

- Hornopiren Fish farm (2019-20), new hatchery to 6MM eggs and new fry room. Puerto Montt, Chile

- Pargua fish Farming (2015-18), new Transfer Centre with individual RAS technology. Puerto Montt, Chile

- New in Land Salmon Fish Farm (2019). Preliminary RAS design. Serving as senior Engineer. Client: Confidential

- Colaco Fish Farm Pre-feasibility study (2019). new recirculating fish farm design. Client: Invermar

Raed El Sarraf

Technical Principal Materials and Corrosion

Raed's duties range from site investigations, developing long term maintenance strategies, to specification writing, setting up and overseeing quality assurance and control systems.

His current interests are related to identifying and realising the long term sustainability benefits of structural steel, reducing its carbon footprint and wastage in the construction industry.

Relevant Experience

Transpower Substation Support Structures Deterioration and Refurbishment, Aotearoa New Zealand-wide (2019 - present): Transpower, Technical Principal.

Refining NZ Flare Structure Galvanizing Deterioration Modelling, Whangarei (2017): Refining NZ, Corrosion and Asset Integrity Consultant.

Ohau Diversion Wall Remediation, Rotorua, (2015-Present): Bay of Plenty Regional Council, Corrosion and Asset Integrity Consultant

Auckland Harbour Bridge Technical Support, Auckland (2014 – present): AHB Alliance, Technical Advisor and Coatings Inspector

Condition Assessment, Rehabilitation and Failure/Root Cause Analysis of Metallic Structures and Components, (2005 – present): Various

Gary Chalmers

Technical Principal Ports and Marine

Gary is the Technical Principal for WSP ports and marine operating out of our Christchurch Office. Gary's key skill areas include the design/asset management of marine works, heavy civil engineering and risk management. Gary has both significant local and international experience, and has undertaken peer reviews for numerous marine projects.

Relevant Experience

Lyttleton Port Company. Numerous different tasks and responsibilities. Key roles include the review of new wharves on Te Bay reclamation and planning for reinstatement of key assets destroyed in 2010//11 Earthquakes.

CentrePort. Numerous asset management tests.

Port Marlborough. Port expansion study to 2025, review of wharf options for new Kiwi Rail frames.

Adrian Wright

Hydraulic Modelling and Project Manager

Adrian is an associate in the UK Water Specialist team with 19 years experience. Adrian has an expert understanding of hydraulic and morphological modelling having used a wide range of modelling tools to consider flood inundation, hydrodynamics, waves, water quality, sediment transport and coastal process.

As well as being a hydraulic modelling expert, Adrian is a highly experienced project manager having managed numerous inland and coastal projects.

Relevant Experience

2019 - Government of the British Virgin Island. Lead Coastal Modeller for hurricane and long-term extreme wave analysis.

2018 - Delma Port, UAE. Project manager and technical modelling lead for the construction of wave transformation and boussinesq wave model to consider penetration in Delma Port

Paradise Island UAE. Project manager and technical modelling lead for northern and south beaches.

Andrew Robinson

Technical Principal Ports and Marine

Andrew is an experienced and qualified Senior Manager with extensive background in project management, design engineering, construction and infrastructure management. Andrew has very strong leadership, financial and people management skills and a proven record of achieving revenue and margin growth.

Relevant Experience

2018 – Primeport Evans Bay Wharf. Project Director for the feasibility and concept design for a new multi-purpose wharf adjacent to a logyard.

2018 - Lyttleton Port of Christchurch. Project Director for reconfiguration and rebuild of back roads to accommodate additional rail sidings.

2012 – 15 – Lyttleton Port of Christchurch. Project Director for the rebuild of the $70 m main container wharf structure.

Alexei Murashev

Technical Principal, Geotechnical

Dr Alexei Murashev is a WSP Technical Principal, Geotechnical Work Group Manager with 30+ years of geotechnical and general civil experience. Alexei has extensive expert knowledge of geotechnical issues and risks associated with construction in marine environment. He was the Lead Geotechnical Engineer for the concept design of the Horoirangi Aquaculture Project in Nelson.

Relevant Experience

Horoirangi Aquaculture Project - Nelson (2007-2010)

Lead Geotechnical Engineer for preliminary feasibility studies and concept design of commercial aquaculture ventures Wakatu land at Horoirangi.

CentrePort Resilience Project (2017 – present)

Project Director and reviewer for the geotechnical assessment and improvement of resilience of CentrePort ground and operations. Development of a port resilience assessment framework, the assessment of risks posed by natural hazards and the preparation of a business case for ground resilience improvements.

Michael Watson

Senior Environmental Scientist

Michael Watson is a Senior Environmental Scientist with over 16 years of consulting experience in contaminated land assessment, management and remediation in Australia and Aotearoa New Zealand. Michael has managed and designed contaminated land assessments for a variety of sites including projects in the transport (road/rail), oil and gas, energy and water industries.

Relevant Experience

Due diligence contamination assessment (PSI/DSI), Unitec (2017-2019): Unitec, Project Manager and Technical Lead.

Michael was the lead environmental scientist and project manager for CLM components of a combined due diligence geotechnical/environmental investigation of the Unitec campus in Mount Albert, Auckland.

Phase 1 preliminary site investigation (PSI) and Phase 2 detailed site investigation (DSI), Northcote, Auckland, Aotearoa New Zealand (2017): Auckland Council, CLM Project Manager.

Michael was the lead environmental scientist for CLM components of a combined geotechnical and environmental investigation of a public reserve for Auckland Council. The assessment works were required to assess the site prior to planned upgrade works.

Roy Van Ballegooyen

Senior Natural Scientist

Roy is a professional natural scientist with over 36 years' experience in the maritime research sector, gained while working in academic research, applied research and engineering consulting environments. He has extensive experience in numerical modelling of hydrodynamics, water quality and sediment processes in coastal and estuarine environments.

Relevant Experience

Environmental Impact Assessment Specialist Study for Hood Point Marine Outfall, East London, South Africa (2016-2018): Marine Modelling Specialist - Hydrodynamic and water quality modelling to inform proposed Hood Point outfall ecological assessment. Client: Buffalo City Municipality: Project Value: estimated ZAR $200 Million. ($20.5M NZD)

Aqua Sea – Strategic Environmental Assessment for Aquaculture development, South Africa (2017-2018):

Specialist inputs into the marine component of an SEA for the development of aquaculture in South Africa. Client: CSIR (in collaboration with the Department of the Environment and Department of Agriculture, Forestry and Fisheries). Project Value: undisclosed.

Rowan Dixon

Senior Coastal Engineer

Dr Rowan Dixon brings over 13 years' experience in sustainable development and environmental management, with an emphasis across Asia Pacific and Aotearoa New Zealand. His experience spans compliance and voluntary sustainability policy, legislation and practice from international to local scales across climate change, land use, water, biodiversity, coastal, energy, infrastructure, trade and commerce.

Relevant Experience

Carbon Neutral Procurement Pathway and Tool Development, 2018 – present. Client: Christchurch City Council Position Held: Carbon Neutral Technical Specialist

Leading cross industry collaboration to guide the Council's strategic asset management team to deliver carbon neutral pathways and tools for their infrastructure managers and portfolio.

Sustainability Strategy for Auckland Motorways Alliance (AMA), 2018-Ongoing. Client: Auckland Motorways Alliance Position Held: Sustainability Specialist

Responsible for developing sustainability and resilience framework and strategy for the AMA to demonstrate contribution to the Sustainable Development Goals.

Joao Machado

Spatial Planning – Strategic Infrastructure Integration

Joao has over 20 years experience as a planning and resource management specialist in local government and the private sector, both in New Zealand and overseas. Joao is focused on outcomes-driven strategic planning, public participatory spatial planning best practice, major infrastructure project delivery and funding, and has extensive experience establishing and delivering urban, coastal and rural strategic planning projects.

Relevant Experience

2018 – 2020 – Kaipara District Spatial Plan – Ngā Wawata 2050: project director and spatial planning lead for the Kaipara District Council spatial plans

2010 – 2018 – Auckland City Centre spatial plans, including the Waterfront Plan, City Centre Masterplan, and planning policy for Wynyard Quarter, Britomart, Downtown ('Commercial Bay' site), and Ports precincts

2009 - 2018 – Auckland Council, Hauraki Gulf Islands strategy and policy planning manager, including technical support for the Hauraki Gulf Marine Spatial Plan, and helicopter noise provisions

2002-2009 – planning policy, coastal permits, wharves and mooring approvals, commercial and residential development reporting in coastal areas on Kawau Island and Auckland Region.

Andrew Springer

Technical Principal - Water Treatment

Andrew brings over 30 years of Wastewater Treatment experience from across NZ, Australia and the UK. He has had roles as operator, asset owner, contractor, programme manager and specialist consultant. He has experience of developing strategy, feasibility, troubleshooting and optimisation, setting up frameworks for suppliers, concept, preliminary and detailed design, commissioning and project takeover across a wide range of processes on over 500 treatment plants

Relevant Experience

Havelock STP, Havelock, Marlborough, New Zealand (2018 - Present): Marlborough DC, Principal Process Engineer

Opotiki WWTP Review, Opotiki, Northland, New Zealand (2019 - 2021): Opotiki DC, Lead Technical Engineer

Rangitikei DC Consent Renewals Programme, Palmerston North, Taranaki, New Zealand (2021 - Present): Rangitikei DC, Wastewater Technical Advisor

Mangawhai CWWTP Long term strategy, Mangawhai, Northland, New Zealand (2018 - Present): Kaipara DC, Lead Technical Engineer