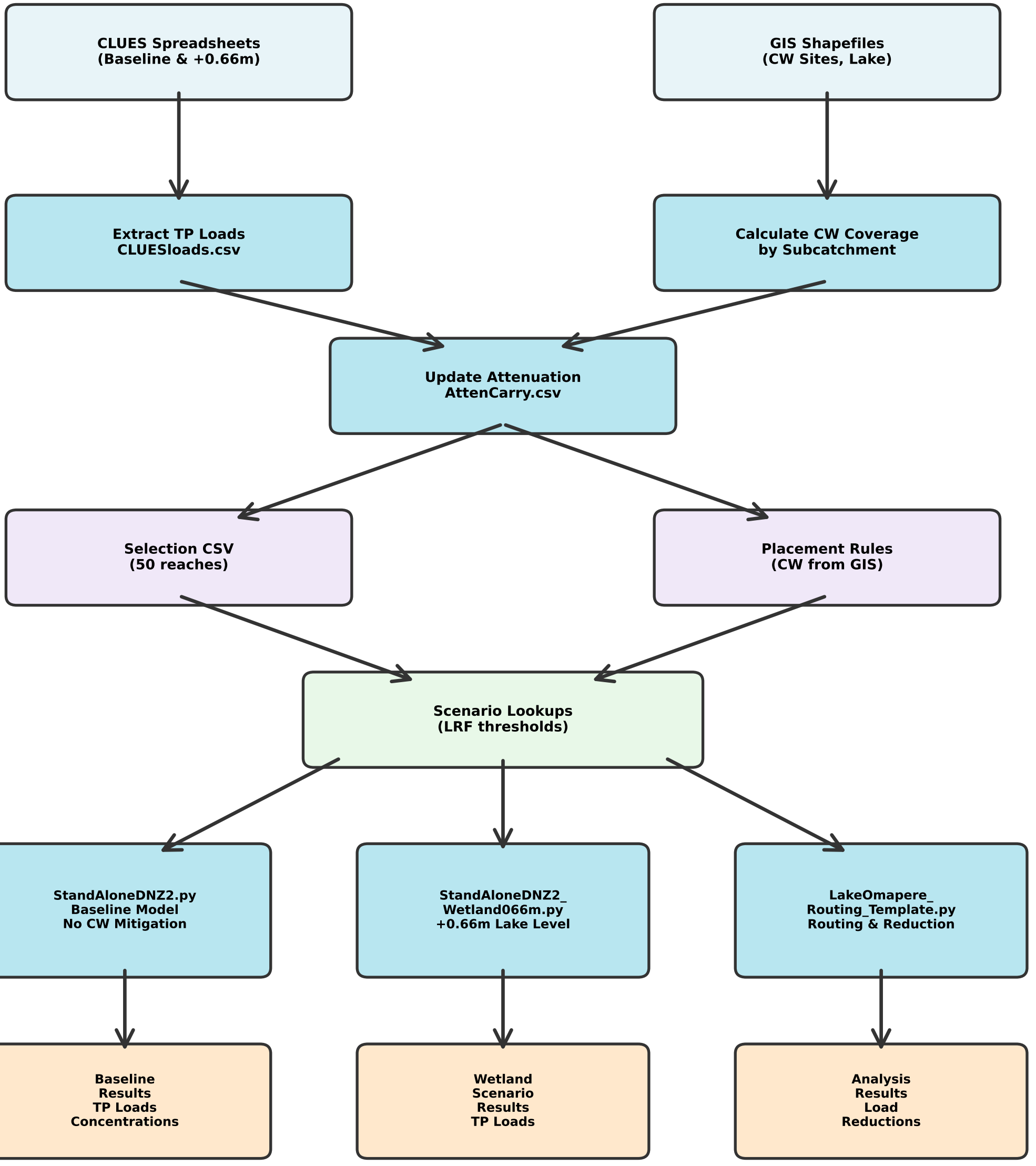
Lake Ōmāpere CW Mitigation Project

Overall Architecture & Data Flow



Model Input Files & Data Structure

InputData/, SelectionFiles/, and Lookups/ Directories

CLUESloads_baseline.csv

Columns:
- TPAgGen
- soilP
- TPGen
- TPps

CLUESloads_wetland_066m.csv

Same structure
Updated TP loads for 0.66m scenario

AttenCarry_baseline.csv

Columns:
- PstreamCarry
- PresCarry
- By reach

AttenCarry_wetland_066m.csv

Same structure
Updated for lake rise impact

LakeOmapere_Selection.csv

Columns:
- Reach ID
- Selection (0/1)

For 50 reaches

CW_Subcatchments.csv

Columns:
- Subcatchment ID
- CW coverage %

34 subcatchments

Scenarios_LakeOmapere.xlsx

3 LRF scenarios:
<2% coverage
2-4% coverage
>4% coverage

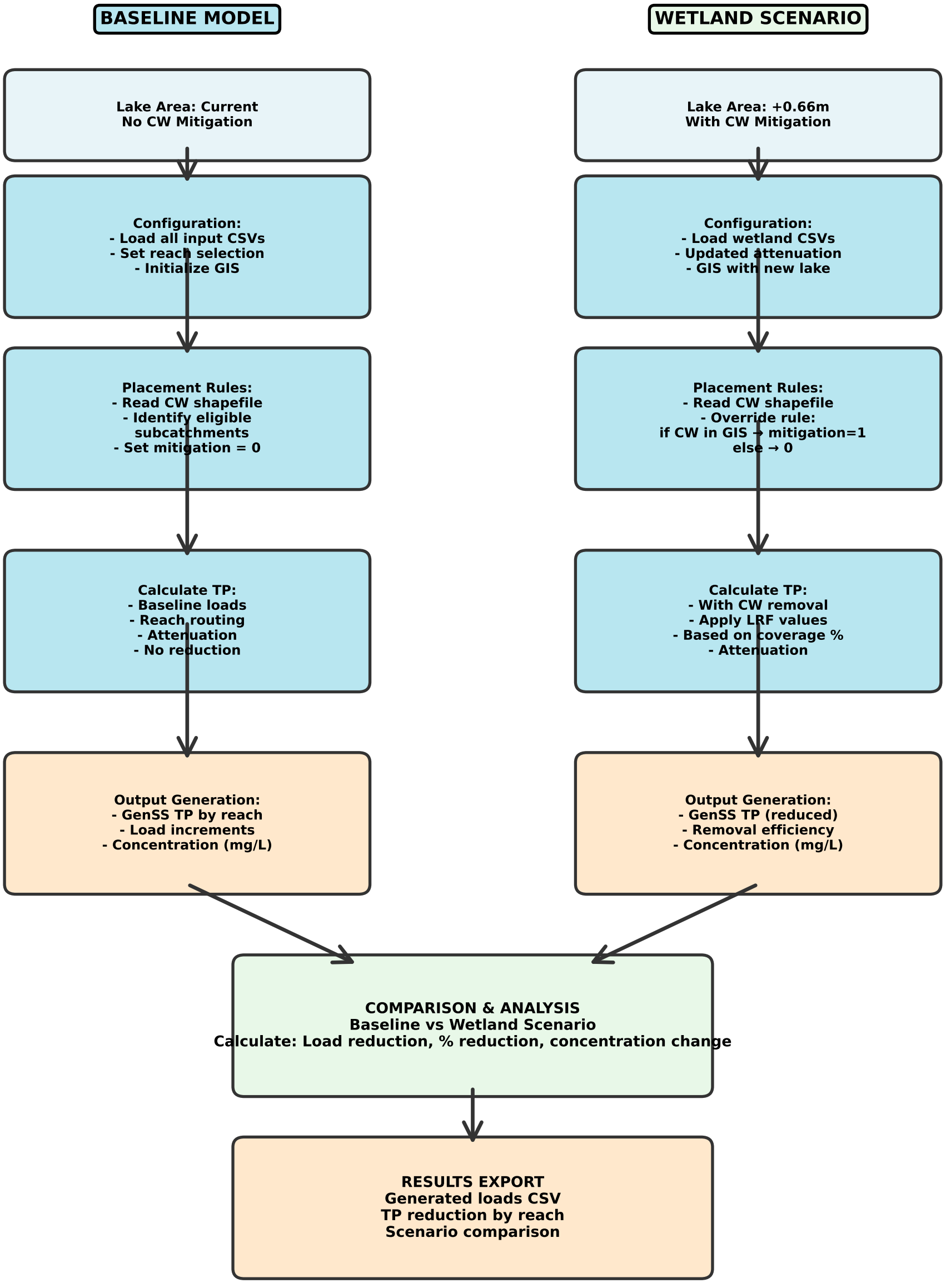
LRFs_years.xlsx

LRF values by:
- Coverage level
- Time period

For P reduction

Model Configuration & Processing Logic

StandAloneDNZ2.py & StandAloneDNZ2_Wetland066m.py



Complete Data Flow & Processing Pipeline

From CLUES to Final Analysis

SOURCE DATA

CLUES Spreadsheets

GIS Shapefiles

Field Surveys

DATA PREPARATION

Extract TP Loads by Reach

Calculate CW Coverage by Subcatch

Update Attenuation Factors

MODEL CONFIGURATION

Create Selection CSV

Setup Placement Rules

MODEL EXECUTION

StandAloneDNZ2.py

BASELINE Model Run

StandAloneDNZ2_Wetland066m.py

WETLAND Model Run

ANALYSIS & OUTPUTS

Baseline Results TP Loads

Comparison & Analysis Reductions

Routing & Reporting Maps/Tables

Scenario Comparison & Analysis Strategy

Baseline vs Wetland CW Mitigation

SCENARIO 1: BASELINE

Lake Area: Current
No CW Implementation
No TP Removal
Baseline Conditions

Model Configuration
- Current CLUES loads
- Baseline attenuation
- Current GIS layer

Processing
- Read 50 reaches
- No mitigation applied
- Standard routing

Outputs
- Baseline TP loads
- Reach concentrations
- Loads by reach

SCENARIO 2: WETLAND (CW MITIGATION)

Lake Area: +0.66m
CW Implementation
Surface & GW CW
Removal: <2%, 2-4%, >4%

Model Configuration
- Updated CLUES loads
- Revised attenuation
- New lake GIS layer

CW Processing
- Apply CW placement
- Determine coverage %
- Select LRF values

TP Calculation
- Apply removal rates
- Calculate reductions
- New concentrations

COMPARISON & ANALYSIS

Calculate for each reach:
• Load difference = Baseline - Wetland
• % reduction = (Difference / Baseline) × 100
• Concentration change (mg/L)
• Effectiveness by subcatchment

RESULTS & REPORTING

Output files:
• TP_Reduction_by_Reach.csv
• Scenario_Comparison.xlsx
• Maps & visualizations

KEY PERFORMANCE INDICATORS

• Total TP load reduction (tonnes/year)
• % reduction by subcatchment
• Reaches with >50% reduction
• Cost-effectiveness analysis

Project Directory Structure & Output Files

Complete File Organization

PROJECT ROOT: C:/Users/moghaddamr/Reza_CW_Analysis/

[DIR] Model/

[DIR] CLUES_Data/

[DIR] Analysis_Scripts/

[DIR] Documentation/

Model/

- **InputData/**
  CLUESloads, AttenCarry
- **SelectionFiles/**
  Reach selection CSVs
- **Lookups/**
  Scenarios, LRFs
- **Outputs/**
  Model results

Scripts/

- **StandAloneDNZ2.py**
  Baseline model
- **StandAloneDNZ2_**
  Wetland066m.py
  Wetland scenario
- **LakeOmapere_**
  Routing_Template.py
  Routing analysis
- **PlacementRules.py**
  CW placement

Input Data/

- **('CLUES spreadsheets\nbaseline & wetland', 10.1)**
- **('GIS shapefiles\nCW sites, lake', 9.4)**
- **('Coverage analysis\nCSVs', 8.7)**

Documentation/

- **annette.txt**
  Original instructions
- **PROJECT_STATUS.md**
  Status summary
- **LAKE_OMAPERE_**
  MODEL_READY.md
  Complete guide
- **FILE_MANIFEST.txt**
  File inventory

KEY OUTPUT FILES GENERATED BY MODELS

- **GenSS_Baseline.csv**
  Baseline TP loads
- **TP_Reduction.csv**
  Load reduction values
- **GenSS_Wetland.csv**
  Wetland scenario TP
- **Comparison.xlsx**
  Scenario comparison

ARCHIVE/

Model_DNZ_OriginalTemplate/
(Old DNZ scripts, not used in Lake Ōmāpere)

PROJECT STATISTICS:
• Total Python scripts: 7 (active)
• Data files: 20+ CSVs & Excel files
• Shapefiles: 15+ (GIS data)
• Documentation: 10+ files
• Total project size: ~500 MB