



Hydrology Tool

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Purpose of the hydrology tool

Vegetation
and soil tools



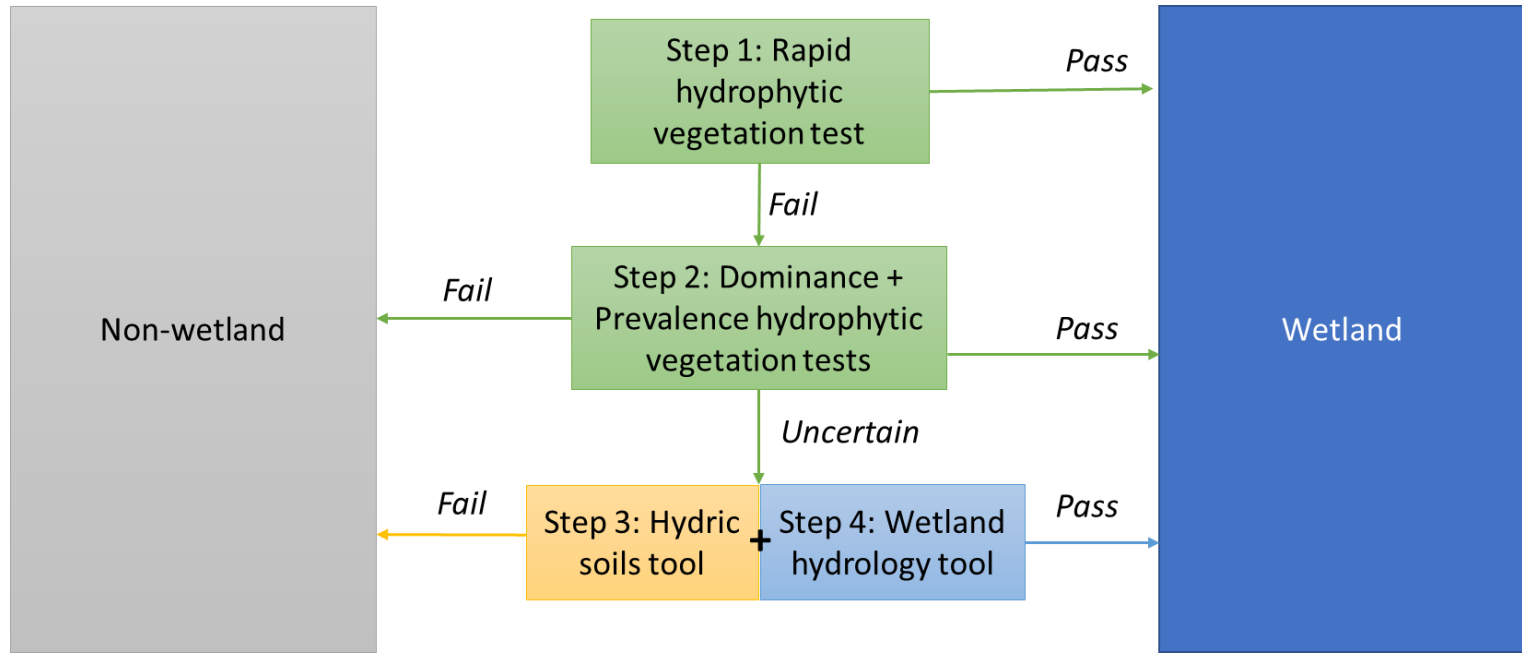
Area was a wetland over
medium to long term

Hydrology tool



- Confirms area remains wetland
- Hydrophytic veg and hydric soils not indicators of past hydrology







Definition of wetland hydrology

- An area must be:
 - Inundated for >7 consecutive days in growing season in most years.
 - Water table within 30 cm (15 cm for sands) of soil surface for >14 consecutive days in the growing season for most years
 - 50% probability of recurrence

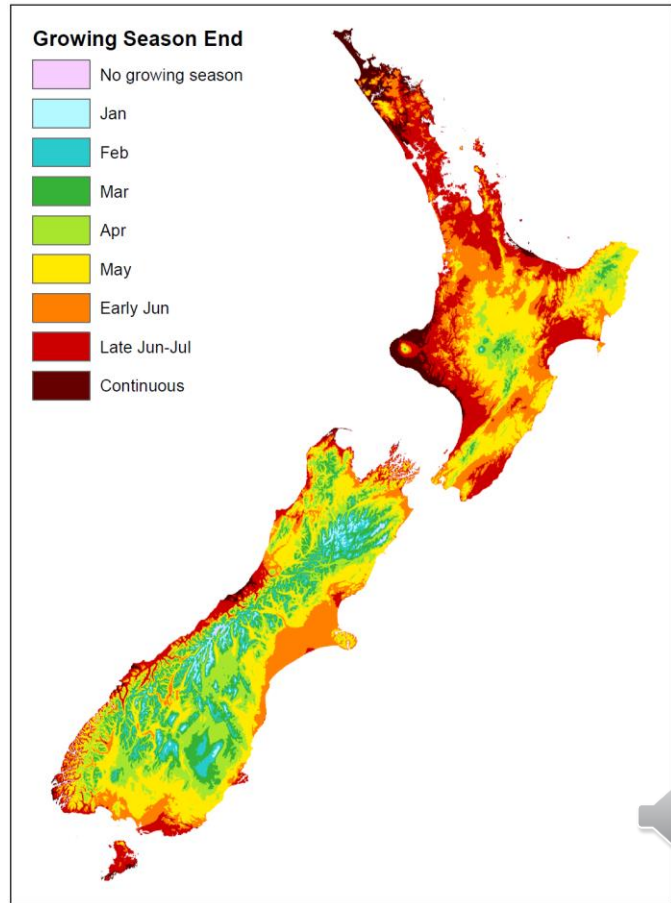
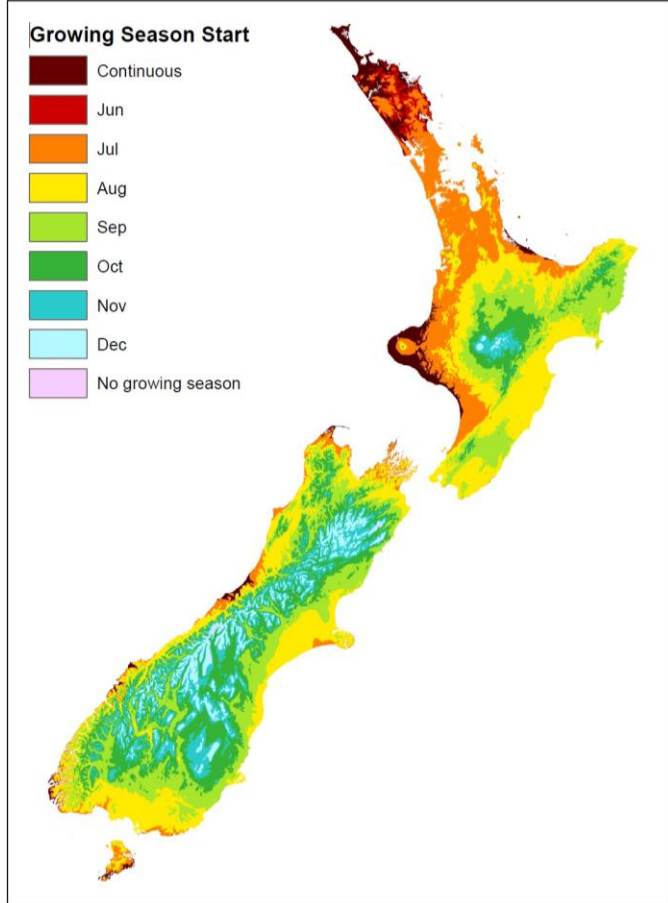




Growing season

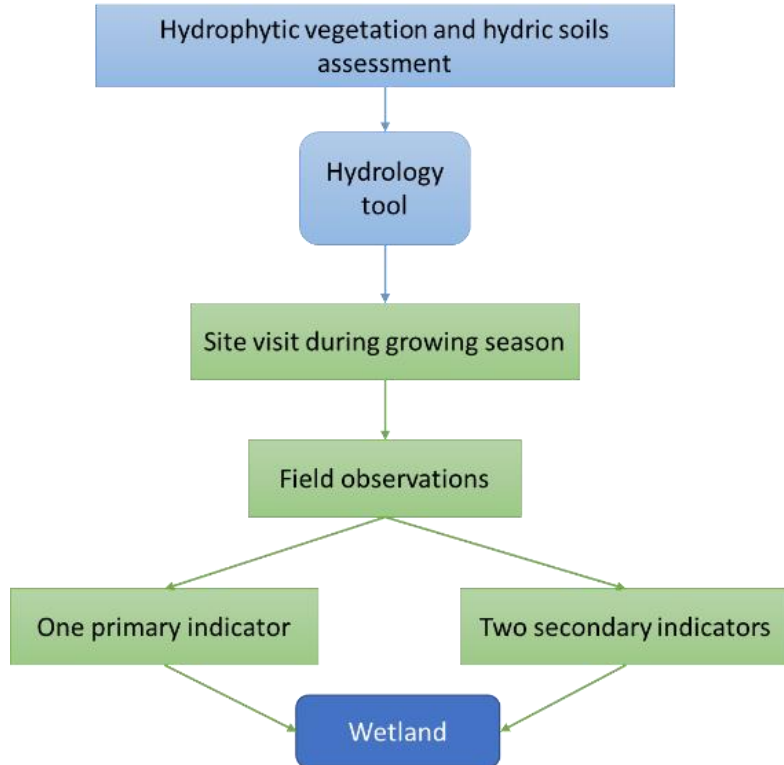
- “Plants accumulating biomass or active soil microbial community”
- Soils/air easier/more reliable than plant growth
- Soil $>5^{\circ}\text{C}$ in top 30 cm profile
- Air $>-2.2^{\circ}\text{C}$
- Window between the start and end of growing season





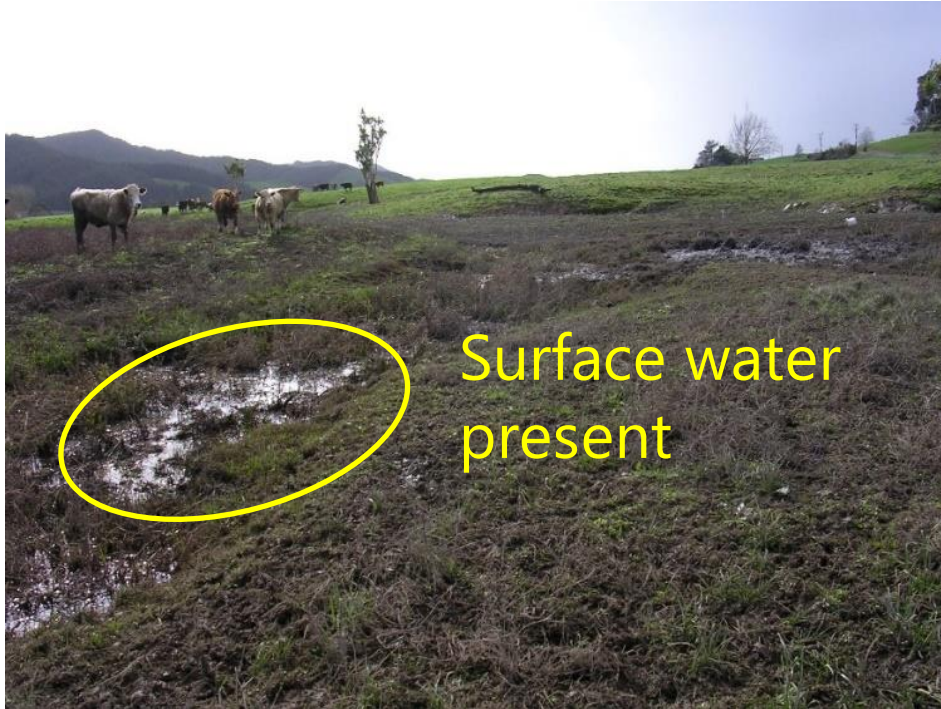


Wetland hydrology indicators



- One primary indicator
 - 19 primary
- OR Two secondary indicators
 - 8 secondary
- 4 categories
 - Observation of flooding or groundwater
 - Evidence of flooding or ponding
 - Evidence of current or recent soil saturation
 - Evidence from other site conditions or data

Primary indicators



Soil saturation: water glistening inside and outside of peds



Water marks



Sediment deposits



Drift deposits





Algal mat on soil surface



Iron deposits



Surface soil cracks



Inundation visible on aerial imagery



Sparsely vegetated concave surface



Salt deposits





Aquatic invertebrates



Water-stained leaves



Primary or
secondary
indicator

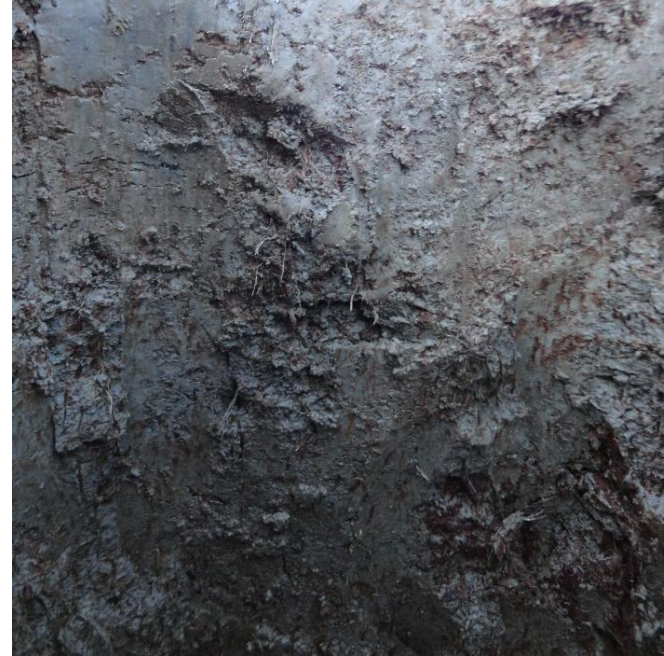


Hydrogen sulphide odour



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Oxidised rhizospheres around living roots



Presence of reduced iron



Recent iron reduction in tilled soils



High water table stunted or stressed plants





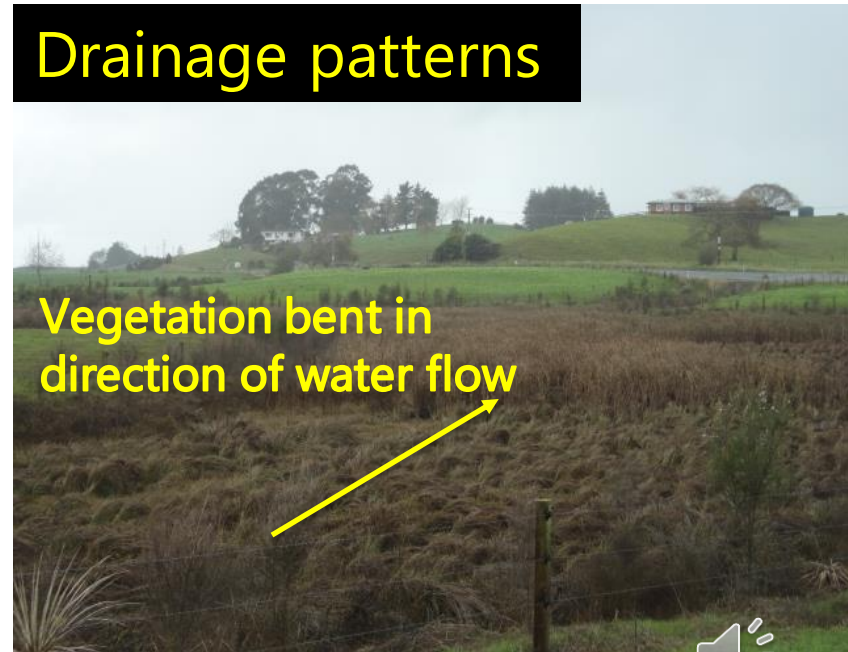
Secondary indicators

Water-stained leaves



Primary or
secondary
indicator

Drainage patterns



Vegetation bent in
direction of water flow



Dry-season water table

- A water-table depth between 30 centimetres and 60 centimetres of the soil profile can be seen during the normal dry season or a drier-than-normal period of the year.

Saturation visible on aerial imagery



18/Oct/2017

3/Mar/2019



Geomorphic position



• Shallow aquitard

- A semi-permeable–impermeable layer is confirmed within 60 centimetres of the soil surface, which decreases movement of groundwater and causes a perched water table within 30 centimetres of the soil surface during the growing season. This semi-permeable–impermeable layer can be composed of clay or non-porous rock





Facultative-neutral test

- Compile list of dominant plant species
- Remove FAC plants
- 50/20 rule as per vegetation tool
- If $\geq 50\%$ remaining species are FACW and/or OBL wetland plants, then the test is passed.
- The test can be used in systems where no FAC dominant plants are present and, if OBL and FACW plants are present in equal numbers compared with FACU and UPL plants, then the non-dominant plants should also be assessed.
- FAC-neutral test: Dominant species $(OBL + FACW) > (FACU + UPL)$.

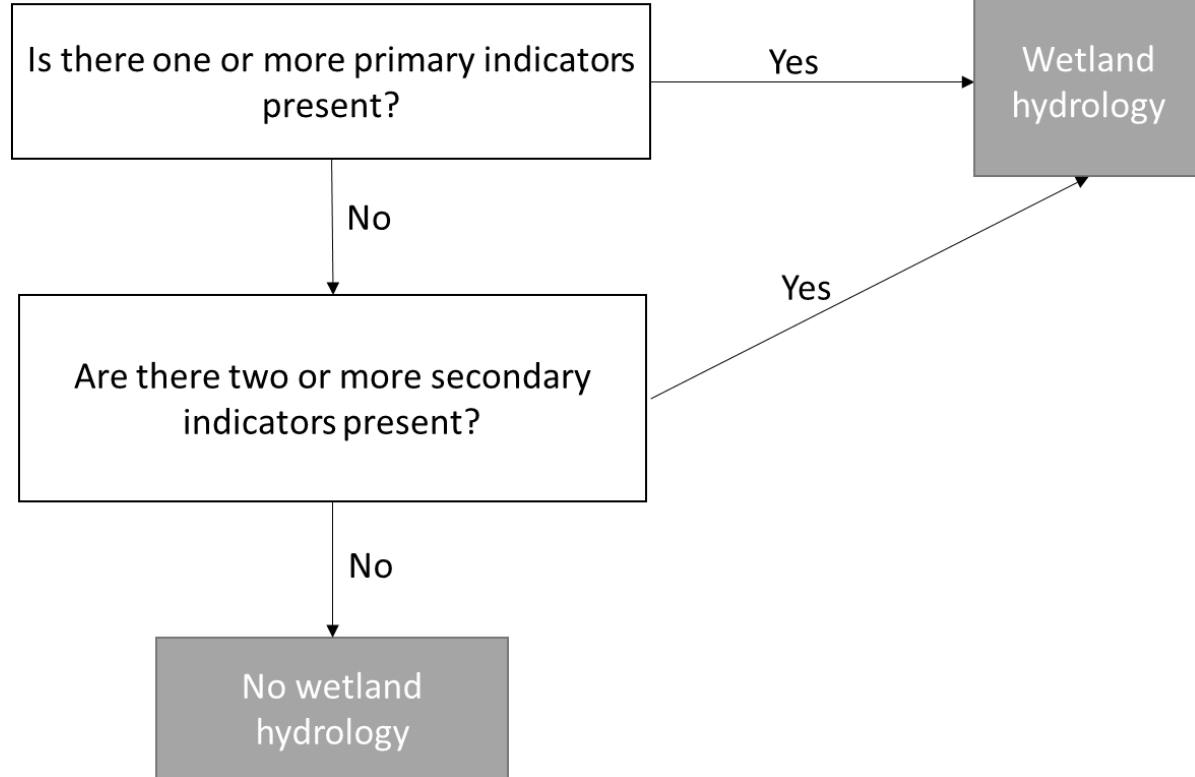


Frost-heave hummocks





In the growing season





Hydrology tool

- Office approach
 - Soils tool - measures depth to water table
 - Use indicator 1B - Groundwater within 30 cm for pass/fail
 - Soils tool – ponding tick box
 - Use indicator 1A (surface water) for pass/fail
 - Inundation visible on aerial imagery (indicator 2G) over time.
- Field approach
 - Step 1: Visit during growing season
 - Step 2: Visit during normal weather conditions (i.e. not post cyclone)
 - Check soil temperature
 - Establish transects for veg assessment
 - Do hydrology assessment with soil assessment
 - Identify presence of hydrology indicators as per field sheet





Acknowledgements

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