

## 3. Metadata for the Motueka Catchment

A wide variety of information and data are available for the Motueka Catchment, including maps, air photos, electronic and paper databases, books, published and unpublished reports. A comprehensive bibliography of publications on the Motueka has been compiled as part of the ICM Programme and this is available on the ICM website<sup>39</sup>. A more complete listing of metadata is also included on the website.

The main types of data available for the Motueka Catchment are summarised below.

### 3.1 MAPS, PHOTOS, SATELLITE IMAGERY

- NZMS260 topographic maps (1:50,000 scale) in paper and digital form (from which a 25-m-resolution digital elevation model (DEM) has been generated using the 20-m contours). Derivative products (e.g., shade map, aspect, slope, topographic index) can also be generated.
- Earlier maps include the NZMS1 1:63,360 scale maps and 1:15,840 compilation sheets, plans of the Motueka District in 1842, 1851 and 1895, Motueka town area 1929, Big Bush District 1906, Wangapeka District 1896, Tadmor District 1902. Copies are held at the Nelson Provincial Museum and the Motueka Museum.
- Various old photos of the river and catchment dating back to the late 1800s are held in the Nelson Museum, mainly in the Guy and Tyree collections but also some others, and in the Motueka Museum.
- Aerial photo coverage, taken by NZ Aerial Mapping (Hastings) and Aerial Surveys (Nelson), is available from 1937 onwards. Available extensive surveys include: Motueka River (1937, SN65, 1:10,843 scale), Tobacco surveys Motueka (1940, SN141, 1:16,176 scale), Motueka State Forest survey (1940, SN142, 1:16,176 scale), Golden Downs–Moutere–Nelson (1948, SN379, 1:17,647 scale), Golden Downs State Forest

<sup>39</sup> <http://icm.landcareresearch.co.nz/> – see the library of resources.

(1956, SN886, 1957, SN1022, 1:11,029 scale; 1966, SN1861, 1:10,508 scale; 1972, SN3443, 1:16,176 scale), Farewell Spit–Runanga–Amberley (1968, SN2033, 1:82,758 scale), Kaiteriteri–Mount Richmond (1969, SN3196, 1:24,264 scale), Upper Motueka River (1979, SN108158, 1:40,000 scale), Tasman Bay rivers 1983 flood series (SN10992, 10993, 10994, 10996, 10998, 11001A, 11002A, 11003A, 11004A, 11006, 11007, 11008, 11009, 11010, 11011, 11012, 11013, 1983, 1:15,000 and 1:10,000 scale), Mt Richmond State Forest Park (1983, SNC8294, 1:25,275 scale), Motueka River catchment (1984, SN11019, 1:57,000 scale), Nelson Regional Survey (1997, 1:27,500 scale), SN12391 (1996–98, 1:50,000 scale), SN12391B (1998, 1:50,000 scale). Copies of many of the available photos are held by Tasman District Council, who also hold a variety of oblique aerial and ground photographs in a physical image library, including some video footage of floods (e.g., 1995). Tasman District Council holds many detailed vertical aerial photos (1:1000–1:4000 scale) of the Motueka River and its tributaries from the 1950s onwards.

- Tasman District Council has recently commissioned a complete series of aerial photographs at 1:25,000 scale, from which digital orthorectified images are now available.
- Satellite images include a SPOT image from February–March 1996 (from which the Land Cover Database was generated) and some recent Landsat data.

### 3.2 CLIMATE

- NIWA's climate database (CLIDB) holds current (Riwaka, Graham River, Motupiko, Tapawera, Lake Rotoiti) and historical data (Motueka, Dovedale, Thorpe, Stanley Brook, Baton, Wangapeka, Golden Downs, Atapo, upper Sherry River, Kikiwa, Tophouse, Long Gully, Graham Creek, Hunters) on climate (mainly rainfall, but including temperature, wind run, and evaporation data).

- Tasman District Council currently records rainfall at Woodmans Bend, Woodstock, upper Motueka Gorge, Baton Flats, the Wangapeka at Walters Peak, the Tadmor at Mudstone, the Motupiko at Christies Bridge, Waiwhero, and two sites in the Riwaka. Tasman District Council have synthesised the rainfall data into a map of mean annual rainfall isohyets (Fig. 14).
- Rainfall has been measured by Forest Research Institute and Landcare Research at several sites in Donald Creek (in Big Bush Forest) since 1975.

### 3.3 HYDROLOGY/WATER QUALITY

- The catchment and subcatchment boundaries can be generated from the DEM.
- The stream network is contained in the 1:50,000 digital topographic data and can also be generated from the DEM.
- Tasman District Council currently records flow data for the Motueka at Woodmans Bend, Woodstock, and upper Motueka Gorge, the Baton at Baton Flats, the Wangapeka at Walters Peak, the Tadmor at Mudstone, the Motupiko at Christies Bridge, the Waiwhero, Hunters Creek, and at three sites in the Riwaka (the south branch at Moss Bush, the north branch at Littles, and the main stem at Hickmotts).
- NIWA and Tasman District Council also hold historical data for the Motueka at Blue Gum Corner and Alexander Bluffs, Wangapeka at Swimming Hole and Swingbridge, Kikiwa at Weir, Graham Creek at Weir, Roughn's at Weir, Long Gully at Meads Road, Stanley Brook at Barkers, Rocky River, Rainy River below Big Gully, Clark River at State Highway bridge, Dart River at Devils Thumb, Sherry River at Blue Rock, Ellis River at Baton confluence, Skeet River at Baton confluence, Dove River at Motueka confluence, Pearse Stream at Caves, Pearce Stream at Motueka confluence, Graham River below

- forks, Little Pokororo at Motueka confluence, Pokororo at Motueka confluence, Orinoco at Ngatimoti, Herring Stream at Motueka confluence, Shaggery River at Tom Evans, Little Sydney Stream at bridge, and the Brooklyn Stream at DSIR. From these sites estimates of flow statistics can be derived (e.g., mean flow, median flow, low flows at varying recurrence intervals, flood flows).
- Flow has measured by Landcare Research from four small catchments in Big Bush Forest (Donald Creek) since 1977. One of these catchments is a control catchment in beech forest and in the other three the beech was harvested by different techniques and then the catchments were replanted in pines.
  - The Motueka Museum holds a folder with newspaper articles describing large historical flood events. Tasman District Council holds a file with similar material.
  - Water quality has been regularly monitored by NIWA at Woodstock and upper Motueka Gorge since 1989. Short-term water quality data is available (from the Environmental Sampling Network) for a larger number of sites within the Motueka (see Roger Young, Cawthron Institute).
  - River and stream classifications have been undertaken for the Motueka as part of the ICM Programme (see Chris Phillips, Landcare Research), and in the forestlands of Weyerhaeuser New Zealand Inc. The latter classifies streams in one of four classes (streams of special significance, fish streams, streams with high potential stream power, and small streams), and provides a set of management guidelines and standards for each major forestry activity and each class of stream.
  - Groundwater is monitored at a number of sites on the Motueka and plains (Riwaka Hall, Wratts, Rossiters, Horrells, Smiths, Old Wharf Road), the Moutere Valley (for wells that are recharged by rain falling in the Motueka Catchment) and monitoring has

recently begun in the Tapawera area. Groundwater quality trends are available from key bores.

### 3.4 RIVER CROSS-SECTIONS

- River cross-sections periodically surveyed by Tasman District Council are located in two reaches of the Motueka River. In the lower Motueka, cross sections are located approximately every 0.25–0.5 km from the mouth to Alexander Bluff bridge (a total of 53 sections), and records extend back to 1957. In the upper Motueka, cross sections are located approximately every 0.5–1 km from the Wangapeka confluence to Norths bridge (a total of 30 sections), and records extend back to 1960.
- The earliest well-surveyed cross sections begin in about 1957 (some cross sections were surveyed in 1937) and data are available up to 2001. The period between measurements at any site is variable.
- Detailed cross-sectional data are also available at river gauging stations (taken for flow ratings).

### 3.5 GEOLOGY

- Paper and digital copies of the Nelson QMAP (Rattenbury et al. 1998) compiled at 1:50,000 scale and published at 1:250,000 are available from the Institute of Geological and Nuclear Sciences and Tasman District Council.
- Lithology data are also listed in the NZLRI, available from Landcare Research.

### 3.6 SOILS

- Soil map units are included in the NZLRI, available from Landcare Research (see <http://www.landcareresearch.co.nz/databases/nzlri.asp>). These data are based on the Waimea County survey (Chittenden et al. 1966), compiled at 1:126,720 scale, and the General Survey of Soils of the South Island at 1:250,000 scale (New Zealand Soil Bureau 1968.) The NZLRI

data were originally compiled at a scale of 1:63,360. The NZLRI data are available as map unit data or as soil property data for 16 attributes, including available water capacity, rooting depth, permeability, depth to a slowly permeable horizon, pH, total carbon, P-retention (see <http://www.landcareresearch.co.nz/databases/fdls.asp>).

- Unpublished maps (1:15,840) of the plains and terraces compiled by the Cawthron Institute around 1930–40 show soil map units, soil suitability for tobacco, and land use about 1940. These data are currently being compiled by Tasman District Council.
- The National Soils Database, available from Landcare Research (see <http://www.landcareresearch.co.nz/databases/nsd.asp>), contains detailed data on soil properties (most data are soil chemistry, with limited soil physics and mineralogy). There are few data for soils sampled in the Motueka Catchment, but there are data for many of the mapping units, including Mapua fine sandy loam, Dun silt loam, Haupiri steepland, Hope silt loam (hill soil), Hope fine sandy loam (rolling phase), Kaihiku, Kaiteriteri sandy loam, Korere silt loam (hill soil), Lewis steepland, Matiri steepland, Motupiko loam, Pelorus steepland, Pikikiruna steepland, Spenser steepland, Wakamarama steepland, Whitcombe steepland soil.
- A detailed classification of productive land in Tasman District (Agriculture New Zealand 1994), based on soils, climate and topography, is available from Tasman District Council.
- The NZLRI includes map-unit description of vegetation classes in the late 1970s. Available from Landcare Research.
- The National Vegetation Survey database includes descriptions of permanent vegetation plots in native forests, scrublands and grasslands within the Motueka Catchment. Available from Landcare Research (see <http://nvs.landcareresearch.co.nz>).
- The inventory of tall forest stands on lowland plains and terraces in Nelson and Marlborough (Park and Walls 1978) includes many sites in the Motueka Catchment. The Department of Conservation (Nelson) are currently updating this to an electronic database and are developing a threatened plants database.
- The ecological district classification (McEwen 1987) broadly describes the former native vegetation and current vegetation cover.
- Wetlands are identified in a Tasman District Council/Fish & Game MS Access database and Department of Conservation "Wetlands of Ecological and Representative Importance" database.
- Department of Conservation BIOSITE and Index databases includes information on sites of special wildlife interest, bird distribution (blue duck, falcon, kea, kākā, kiwi), land snail, amphibian and reptile distribution.
- Tasman District Council maintain a pest control database that includes the locations of weeds (e.g., giant buttercup, gorse, broom, hawthorn, buddleia, old man's beard) and maps of management areas for weeds and pests.

### 3.7 VEGETATION AND TERRESTRIAL ECOLOGY

- The Land Cover Data Base (LCDB) records vegetation cover, classified into 16 classes. These data are derived from SPOT satellite imagery taken in 1996 at 25-metre spatial resolution. Available from Terralink Ltd and Tasman District Council.

### 3.8 AQUATIC BIOLOGY

- Nelson–Marlborough Fish & Game maintain a Waterbody Database that describes ecological and recreational values, fish

species present, water quality class, and management issues in defined reaches of the Motueka. They also maintain a database recording trout numbers at several locations in the Motueka through time (derived from drift-dive data and spawning surveys).

- NIWAs New Zealand Freshwater Fish Database records the occurrence of fish (native and introduced) in freshwaters of New Zealand. Data include the site location, species present and their abundance, as well as information such as the fishing method used and a qualitative physical assessment of the site. (see <http://www.niwa.co.nz/rc/prog/freshbiodiversity/tools#new>).
- Information on macroinvertebrates, species richness and density, macroinvertebrate community index, and native fish distribution in 1988/89 is included in Bruce et al. (1987) and was updated by Ward (1990).

### 3.9 COASTAL

- Coastal areas important for conservation are listed by Davidson et al. (1983).
- Department of Conservation has completed a coastal resource inventory survey (Department of Conservation 1990).

### 3.10 HAZARDS

- Tasman District Council maintain a hazards register, which includes information on earthquakes and faults, flooding, land instability, and coastal erosion.
- Contaminated sites are listed in a Tasman District Council Contaminated Site Register.

### 3.11 Statistical

- Statistical data are compiled by the Department of Statistics for census purposes

based on geographically defined meshblocks (see <http://www.stats.govt.nz/>). Tasman District Council also holds much of this data.

### 3.12 LEGAL

- The Digital Cadastral Data Base (DCDB) is the standard legal boundary database maintained by Land Information New Zealand (LINZ) and includes the legal definition of all roads, railways, hydrographic features, and all surveyed property boundaries (see <http://www.linz.govt.nz/>). It is constantly being updated as new subdivisions and developments occur.

### 3.13 PLANNING

- Tasman District Council maintains a consents database that lists all controlled activities (e.g., discharges to water, permits to abstract water).
- The Tasman Resource Management Plan includes many planning maps, which identify features such as planning zones, land disturbance areas, water management zones, groundwater recharge and surface water yield protection areas, areas subject to various hazards, aquaculture exclusion zone, heritage buildings and trees, archaeological sites.

### 3.14 HERITAGE AREAS

- The national register of the Historic Places Trust lists all protected historic places (archaeological sites, buildings, trees, cemeteries, gardens, shipwrecks, landscapes and many other types of places), historic areas (groups of related historic places), wāhi tapu (places sacred to Māori), and wāhi tapu areas (groups of wāhi tapu). Tasman District Council also maintains a local register.
- The New Zealand Archaeological Association operates a site-recording scheme for all surveyed archaeological sites, irrespective of any form of protection. The scheme is based on paper records for each site (location and nature of the

site) and supplementary information such as maps and photographs. The files for Nelson are maintained by Steve Bagley (Department of Conservation, Nelson), and the Department of Conservation also maintain a computerised index to these sites.

- Significant geological, soils, and landscape sites are listed in the New Zealand Geological Society Geopreservation Inventory (Kenny and Hayward 1993).