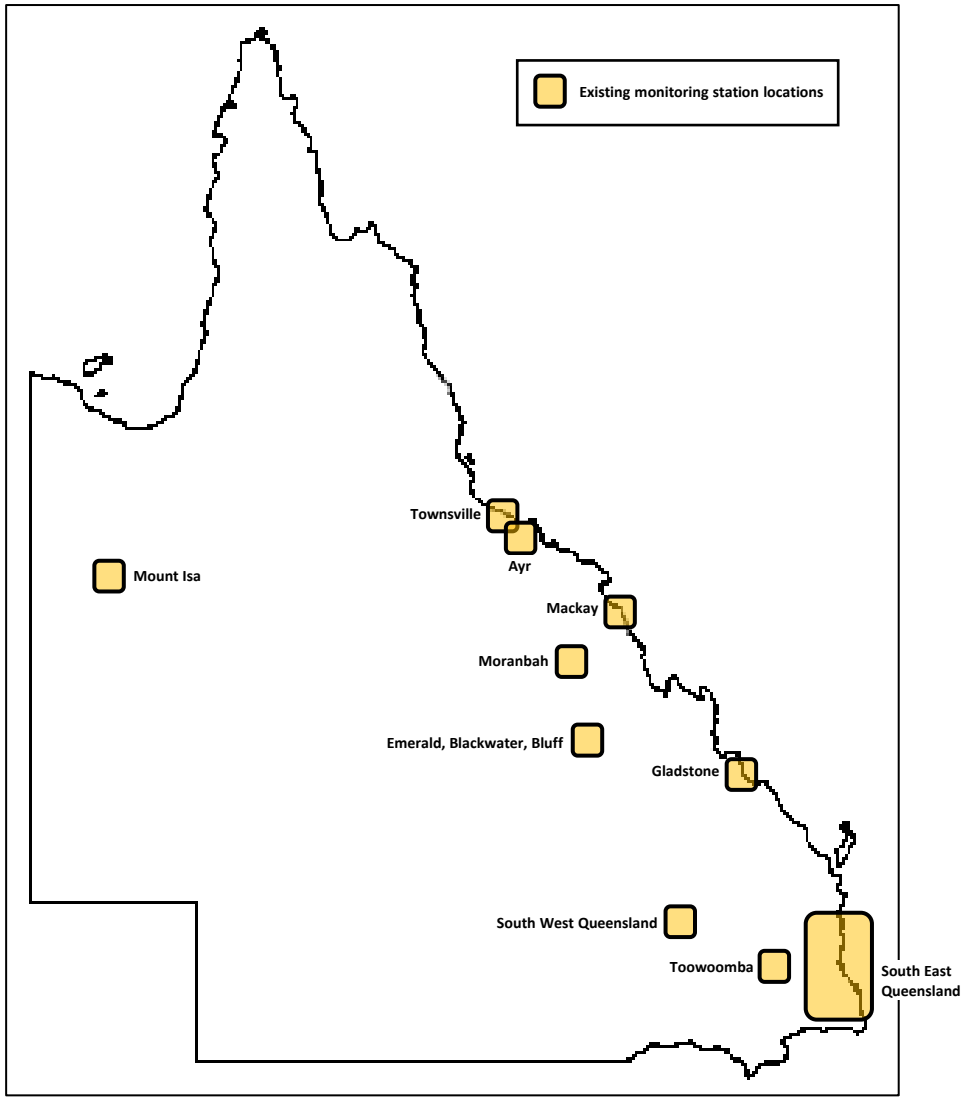
Existing Air Monitoring Network

Purpose

- compliance with ambient air quality guidelines
  - Air NEPM, EPP (Air)
- identify trends
- assess management strategy effectiveness
- investigate local air quality issues

Current network

- 39 stations (including industry sites reporting to DES)
  - South East Queensland – 16 (3 industry sites)
  - Gladstone – 8
  - Central Queensland coalfields – 5
  - Townsville – 4 (3 industry sites)
  - South West Queensland – 2 (2 industry sites)
  - Ayr – 1
  - Mackay – 1
  - Mount Isa – 1
  - Toowoomba – 1
- some are short-term investigation sites
  - e.g. Bluff



Existing Air Monitoring Network

Pollutants monitored

- primarily ‘criteria’ air pollutants
  - ozone
  - nitrogen oxides
  - sulfur dioxide
  - carbon monoxide
  - particles ($PM_{2.5}$, PM_{10})
- other pollutants
  - visibility-reduction
  - metals
  - organic compounds (BTXF)
  - deposited dust
- meteorological parameters
  - wind speed and direction
  - temperature, humidity, rainfall
- suite of pollutants at a site based on local emission sources

Existing Air Monitoring Network

Data sources

- **Real-time webpage** (https://apps.des.qld.gov.au/air-quality/)
  - updated hourly
  - colour-coded against guidelines
  - separate tabs for criteria pollutants, organic compounds, metals, particle sensors and meteorology
  - can drill down to view historic data
  - limited data download functionality
  - validated data uploaded following full validation process, data flag shows data status

Gladstone MAP

Station	Particle $PM_{2.5}$ µg/m³ 1hr avg	Particle PM_{10} µg/m³ 1hr avg	Carbon monoxide ppm 8hr avg	Nitrogen dioxide ppm 1hr avg	Ozone ppm 1hr avg	Sulfur dioxide ppm 1hr avg	Particles TSP µg/m³ 1hr avg	Visibility Mm^{-1} 1hr avg
Auckland Point		15.6						
Boat Creek	126.2	137.9		0.011		0.003		583
Boyne Island	3.7	9.6	0	0.002		0.001		offline
Clinton	7.2	14.9		0.003		0		23
Fisherman's Landing	251.7	427.8		0.01		0		1504
Memorial Park				0.009	0.017	0.001		
South Gladstone	9.7	15.5		0.008		0.001		7
Targinie	304.7	329.8		0.006		0.001		1154

Central Queensland MAP

Station	Particle $PM_{2.5}$ µg/m³ 1hr avg	Particle PM_{10} µg/m³ 1hr avg	Carbon monoxide ppm 8hr avg
Blackwater	3.9	13.4	
Bluff		52.8	
Emerald	6.1	19.5	
Moranbah (Cunningham Way)	4.1	10	
Moranbah (Utah Dr)	4.5	17	
West Mackay	8.5	42.8	

Particle $PM_{2.5}$ at Targinie, Friday 26 March 2021 about Particle $PM_{2.5}$

Targinie station overview

The guideline for Particle $PM_{2.5}$ is 50µg/m³ (1hr avg) and 25µg/m³ (24hr avg).

Hourly averages (µg/m³ (1hr avg))

Air quality category (based on 1hr avg)

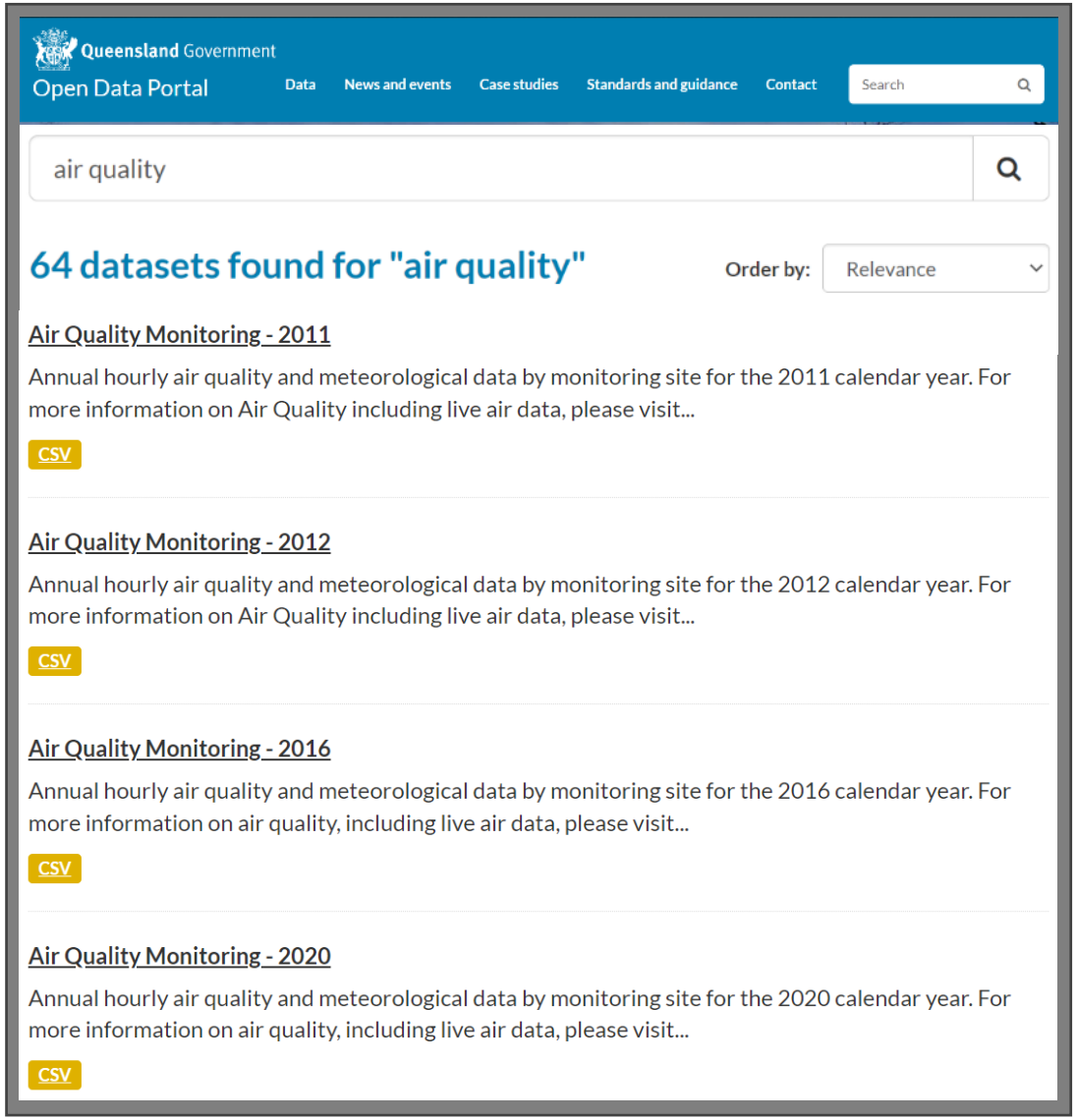
Running averages (µg/m³ (24hr avg))

Existing Air Monitoring Network

Data sources

- **Monthly air quality bulletins** (https://www.qld.gov.au/environment/pollution/monitoring/air/air-reports)
  - three regions (SEQ, CQ, NQ)
  - maximum daily concentrations
  - explanation of cause of any EPP Air objective exceedances
  - prepared following full data validation

- **Open Data files** (https://www.data.qld.gov.au/dataset?q=air+quality)
  - calendar year hourly average data files
  - comma-separated (CSV) format
  - both site basis and parameter basis data files available
  - currently 2009 to 2020 years available, 2021 by June



National Pollutant Inventory

- National database of emissions from industry facility and diffuse sources
  - releases to air, water and land, and wastes transported for treatment/disposal
  - 93 listed substances
  - can be based on measured or calculated values
  - need to report air emissions based on facility annual substance use / fuel combustion
  - reports available for years 1998/99 to 2020/21
  - 2020/21 year: 4381 facilities, 78 industry sectors, 33 airsheds
- Data sources
  - NPI website: (http://www.npi.gov.au/)
  - Australian Government Open Data (https://data.gov.au/dataset/ds-dga-043f58e0-a188-4458-b61c-04e5b540aea4/details)
- Total annual emissions – variations may not directly correlate with changes in ambient air quality
- Ambient air concentrations will depend on additional factors such as:
  - release conditions (profile, height, temperature, control measures, etc)
  - meteorology
- Measure of ‘performance’ rather than a measure of exposure

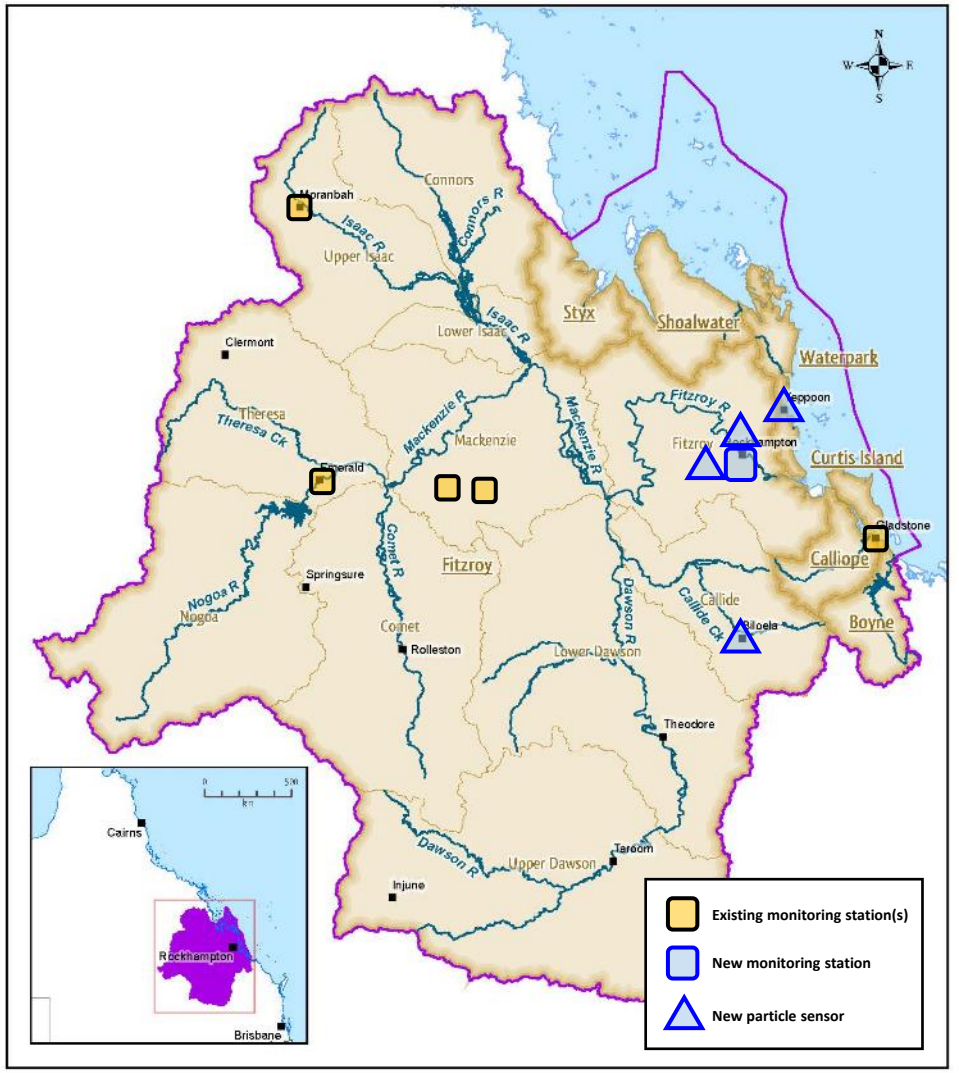
Air Monitoring Network Expansion

Network expansion

- Focus on measurement of smoke exposure from bushfires
- Aim: $PM_{2.5}$ measurement in communities with >3000 population (~ 60 extra locations throughout Queensland)
- Combination of PM_{10} / $PM_{2.5}$ 'reference' instruments and $PM_{2.5}$ particle sensors
- Rollout timeframe is by the end of 2022

Central Queensland expansion

- Monitoring station in Rockhampton
  - PM_{10}, $PM_{2.5}$, ozone, nitrogen oxides
- $PM_{2.5}$ particle sensors
  - Parkhurst (installed September 2021)
  - Gracemere
  - Yeppoon
  - Biloela



Greenhouse Gas Inventory

- State and Territory Greenhouse Gas Inventories (https://www.industry.gov.au/data-and-publications/state-and-territory-greenhouse-gas-inventories)
  - produced by Commonwealth Government
  - overview of annual greenhouse gas emission estimates for each Australian state
  - disaggregation of the emission estimates in the annual National Inventory Report submitted to the United Nations Framework Convention on Climate Change each year

- Queensland Government
  - national inventory not detailed enough to assess impact of Queensland's policies on emissions
  - to develop detailed greenhouse gas emissions modelling to underpin delivery of the Queensland Climate Action Plan
  - modelling to present emissions profile at detailed sectoral, sub-sectoral and spatial levels
  - first stage of modelling is to inform the 2022 Climate Change Action Report
  - updated modelling to inform subsequent Annual Reports
  - Within DES, lead is Climate Change and Sustainable Futures Branch

INVENTORY SECTORS

- electricity
- stationary energy (excluding electricity)
- transport
- agriculture
- fugitive emissions
- industry
- waste
- land use, land use change and forestry