













A listing of the commercially available remote sensors of their: data type, sensor (platform), spatial scale, extent (GRE), resolution (spectral & radiometric & temporal), frequency (time of day), source/cost and archive. See for more details: on airborne and satellite sensors also: <http://database.eohandbook.com/database/instrumenttable.aspx>, and under water acoustic sensors: http://www.ozcoasts.org.au/geom_geol/toolkit/technical.jsp#aeos

Platform		Sensor	Spatial Scales - extent - pixel size	Spectral Resolution and Range	Radiometric Resolution	Temporal Resolution - repeat frequency - time of acquisition	Source(s) for Data	Cost (Indicative only and subject to change. Additional costs may be applicable)	Archives of Data
Digital Airborne Photography		Pan Colour Stereo CIR Stereo	Extremely fine to fine (local) 1:5000 - 1:25000 Extent: 1.3 - 33km ² per photo GRE: 0.05m - 20m	> 100 nm Low -Broad band - Visible - Colour - Green, Red, NIR	> 10 bit (1024 levels)	User controlled (subject to weather and aircraft availability)	Various organisations	\$90 frame to fly and buy hardcopy (Scanning and georeferencing require additional costs)	Contact companies or agencies to determine (at least annual from 1970)
Airborne multi-spectral		Specterra DMSV Daedalus-1268 ADAR	Extremely fine to fine (local) Extent: 100km ² GRE: 0.5 - 10.0m	> 100 nm Medium range: 350 - 2500nm #bands: 3-20	Medium: > 8 bit (256 levels)	User controlled (subject to weather and aircraft availability)	SpecTerra Services www.specterra.com.au AirTarget Services www.airtargets.com.au	Contact companies for quotation (approximately \$2 - \$6/km ² for georeferenced image)	Contact companies for details
Airborne Hyper Spectral		CASI Hymap	Extremely fine to fine (local) Extent: 100km ² GRE: 0.5m - 10.0m	10-50 nm High Range: 400 - 2500nm #bands: > 20	High > 12 bit (4096 levels)	User controlled (subject to weather and aircraft availability)	DSTO (CASI) www.itres.com Hyvista Corporation (Hymap) www.hyvista.com	Contact companies for quotes (approx > \$20/km ² for georeferenced image)	DSTO (CASI) Hyvista Corporation (Hymap)
Airborne laser altimeters		Optech ALTM 1210 / LADS - Profiling laser Enerquest Systems - Scanning laser	Extremely fine to fine (local) Extent: 100km ² Sampling intensity: 10000 pulses per second. 2-10 samples per 1m ²	colour of laser?	Not applicable	User controlled (subject to weather and aircraft availability)	Rotor Resources South-West Pacific Helicopters	\$12.50ha for georeferenced DEM + aircraft mobilization ex-Brisbane	






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high spatial resolution multi spectral	 QuickBird 2 IKONOS GeoEye-1	Extremely fine (local) Extent: 25sqkm+, 49sqkm+ GRE: 0.5-1m (pan) or 1.64-4m (multi)	> 100 nm Medium range: 400-920nm # Bands: 4	High: 11 bit (2048 levels)	morning 3 days Programmable	Geoimage Quickbird www.digitalglobe.com IKONOS www.geoeeye.com GeoEye-1 www.geoeeye.com	See image provider	www.geoimage.com.au
	 Rapid Eye	High: (local, province, region) Extent: 77km swath at nadir GRE: 5m	> 100 nm Medium range: 440-850nm #Bands: 5	Medium: 12bit	Derived product from SPOT5	RapidEye www.rapideye.de Geoimage www.geoimage.com.au AAMHatch www.aamhatch.com	See image provider	www.geoimage.com.au
	WorldView-1	Extremely fine (local) Extent: 25sqkm+ GRE: 0.5m (pan)	> 100 nm Medium range: 400-900nm # Bands: 1	High: 11 bit (2048 levels)	morning 3 days Programmable	Geoimage WorldView-1 www.digitalglobe.com	See image provider	www.geoimage.com.au
	WorldView-2	Extremely fine (local) Extent: 25sqkm+ GRE: 0.5m (pan) or 1.84m (multi)	> 100 nm Medium range: 400-1050nm # Bands: 8	High: 11 bit (2048 levels)	Not yet operational, launch scheduled for October 2009	Geoimage WorldView-2 www.digitalglobe.com	See image provider	www.geoimage.com.au


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moderate spatial resolution multi spectral	 Landsat 7 ETM+ Landsat TM	Medium: (province, region) Extent: 625sqkm - 185km x 185km GRE: 15m (pan) or 30m (multi)	> 100 nm High range: 520-900nm (pan) 450-900nm 1.55-2.35um 10.4-12.5um	Medium: 8 bit (256 levels)	morning 16 days morning 16 days	Geoimage Geoscience Australia National Earth Observation Group (previously known as ACRES) USGS	Free download from USGS, A\$450+	http://glovis.usgs.gov/
	 SPOTMaps	High: (local, province, region) Extent: 100sqkm+ GRE: 2.5m	Medium range: 480-900nm #Bands: 3	Medium: 8 bit (256 levels)	Derived product from SPOT5	Geoimage	See image provider	www.geoimage.com.au
	 SPOT 2 and 4 SPOT 5	High to medium: (local, province, region) Extent: 42km x 42km - 60km x 60km GRE: 2.5m - 10m (pan) or 10 - 20m (multi)	> 100 nm Medium range: 480-710nm (pan) 450-900nm 1.55-2.35um #Bands: 3-4	Medium: 8 bit (256 levels)	morning 1-4 days morning 1-4 days SPOT 2 data not available post June 2009 Programmable	Geoimage	See image provider	www.geoimage.com.au
	 Resourcesat-1 (IRS P6)	Medium: (province, region) Extent: 141km x 141km - 740km x 740km GRE: 23.5m - 56m	> 100 nm Medium range: 520-860nm 1.55-1.7um #Bands: 4	Medium: 7 bit (128 levels) - 10 bits (1024 levels)	morning 5 days (AWiFS) morning 24 days (LISS-III)	Geoimage	See image provider	www.geoimage.com.au
	 ALOS (Daichi)	High to medium: (local, province, region) Extent: 35km x 35km - 70km x 70km GRE: 2.5m (pan) or 10 (multi)	> 100 nm Medium range: 520-770nm (pan) 420-890nm #Bands: 4	Medium: 8 bit (256 levels)	morning 46 days	Geoimage	See image provider	www.geoimage.com.au
	 ASTER	Medium: (province, region) Extent: 60km x 60km GRE: 15m (VNIR) 30m (SWIR) 90m (TIR)	High range: 520-860nm 1.6-2.43um 8.125-11.65um # bands = ????	Medium - High: 8 to 12 bits	morning 16 days	Geoimage	See image provider	http://asterweb.jpl.nasa.gov/





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Low spatial resolution multi spectral	 	SPOT VMI NOAA AVHRR	Coarse: (region) Extent: 2500km wide GRE: 1km	> 100 nm Medium range: 400-2500nm 10um-12.5um #Bands: 4	High: 10 bit (1024 levels)	morning 2 days morning, evening each day	Direct	See also: http://www.ozcoasts.org.au/geom_geol/toolkit/index.jsp	http://noaasis.noaa.gov/
		SeaWifs (OrbView-2 or SEASTAR)	Coarse: (region) Extent: 2200km wide GRE: 1km	> 50 nm Medium range: 400-885nm #Bands: 8		morning each day	Direct	See image provider	http://oceancolor.gsfc.nasa.gov/
Low spatial resolution high spectral	 	MODIS	Coarse: (region) Extent: 2300km wide GRE: 250m (2 bands), 500m (5 bands), 1km (29 bands)	> 100 nm High range: 400-14400nm #bands: 36	High: 12 bit (512 levels)	1-2 days Terra (morning) Aqua (evening)	Direct	See image provider	http://modis.gsfc.nasa.gov/gallery/
		MERIS	Coarse: (region) Extent: 2500km wide GRE: 300m	> 100 nm High range: 390-1040nm #bands: 15	High: 10 bit (1024 levels)	3 days	Direct http://envisat.esa.int/instrument/meris/	See image provider	Direct http://envisat.esa.int/instrument/meris/
Satellite Radar		QuikSCAT	Coarse: (region) Extent: 1800km wide Radar: 13.4 gigahertz, 110-watt pulse at 189-hertz PRF	Not applicable	Not applicable	1-2 days	Direct http://winds.jpl.nasa.gov/missions/quikscat/index.cfm	See image provider	Direct http://winds.jpl.nasa.gov/missions/quikscat/index.cfm

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Underwater Broad-scale acoustic Sensors	Single Beam (e.g. RoxAnn, QTC View or ECHOplus)	single point per depth measurement, area covered determined is determined by distance sailed by vessel.	Not applicable	Not applicable	User controlled (subject to weather and boat availability)	Various organisations See also: http://www.ozcoasts.org.au/geom_geol/toolkit/index.jsp	See also: http://www.ozcoasts.org.au/geom_geol/toolkit/index.jsp	Not applicable
	 Sonar (e.g. Edgetech 272TD, Edgetech DF1000, CodaOctopus 460PX, Klein 3000)	Maximum coverage Sonar needs to be at height that is 10 to 20% of the swath width. For most 100khz systems maximum swath width is 600 m with maximum 0.15 resolution	Not applicable	Not applicable	User controlled (subject to weather and boat availability)	Various organisations See also: http://www.ozcoasts.org.au/geom_geol/toolkit/index.jsp	See also: http://www.ozcoasts.org.au/geom_geol/toolkit/index.jsp	Not applicable
	Multibeam and swath sonar (e.g. Simrad EM 3000 and Reson SeaBat 8125)	Depending on water depth below sensor	Not applicable	Not applicable	User controlled (subject to weather and boat availability)	Various organisations See also: http://www.ozcoasts.org.au/geom_geol/toolkit/index.jsp	See also: http://www.ozcoasts.org.au/geom_geol/toolkit/index.jsp	Not applicable

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Field		Field spectrometers	Field sample plots < 1m ²	High (5-10 nm) Range:350 – 2500nm #bands: > 1000	High > 10 bit (>1024 levels)	User controlled	Hire From: universities (Univ.of Qld, Univ. NSW, USQ) A.Dekker (CSIRO Land & Water) Purchase starting at AU\$10k Or hire via	Field time, car and/or boating	http://www.ozcoasts.org.au/nrm_rpt/library.jsp
		Visual spot check surveys	Field sample plots vary depending on method	Not applicable	Not applicable	User controlled	Various organisations	Field time, car and/or boating	Not applicable
		Georeferenced photo snorkel or diving transects	Field sample plots < 1m ² depending on field of view lens but repeated over along transect (100 m - 2000 m)	Multispectral (blue, green, red)	Medium	User controlled	Various organisations See also: http://www.gpem.uq.edu.au/CRSSIS/publications/GeoPhotoTransects.pdf	Basic high quality cameras and housing cane be purchased for < \$1000. Use with analysis software - http://www.nova.edu/ocean/cpce/	Not applicable
		Georeferenced video transects	Continous field sample plots < 1m ² depending on field of view lens and length of transect	Multispectral (blue, green, red)	Medium	User controlled	Various organisations	Basic high quality cameras and housing cane be purchased for < \$1000. Use with analysis software - http://www.nova.edu/ocean/cpce/	Not applicable