METADATA

The 2011 benthic cover data is given in an ArcMap shapefile format and consists of six associated files:

1. Lizard_2011_BenthicDataTransect
2. Lizard_2011_BenthicDataTransect.dbf
3. Lizard_2011_BenthicDataTransect.prj
4. Lizard_2011_BenthicDataTransect.sbn
5. Lizard_2011_BenthicDataTransect.shx
6. Lizard_2011_BenthicDataTransect.sbx

Data in the *.dbf file are in a tabular format where each line corresponds to a one sample point /photo. The columns for each line give all the associated information for the particular sample photo. Cover for a given major category benthic class or a subcategory benthic class are expressed in percentage based on the 24 points scored for each photo. A description of the column header titles is given by Table 1.

Table 1. Column header description (Note: Fill color in major categories and sub categories denote linkage)

Heading	Heading Info	Notes
ID	Unique number for each data point	
Photo_name	Filename of benthic photo scored	
Date	Date of field collection	
Source	Place of origin of the data (Center and/or University)	GCI: Global Change Institute, GPEM: Geography, Planning and Environmental Management, UQ: University of Queensland
Contact	Person directly responsible with the data creation	
Analysis	Person who analysed the photos	
North_WGS84	Northings in meters (UTM Zone 55 South)	
EAST_WGS84	Eastings in meters (UTM Zone 55 South)	
Y_Latitude	Decimal Degrees	
X_Longitude	Decimal Degrees	
Major categories (Basic)		
C	CORAL	Can recognise coralites and coral is not white or overgrown with turf or coralline algae. Morphology described according to Veron et al (2000)
SC	SOFT CORAL	Not a hard coral, 8 tentacles per polyp, soft, leathery, sometimes colourful
DC	DEAD CORAL	Can recognise corallites; may be white (recently dead) or overgrown with turf algae
SG	SEAGRASS	Grass-like flowering plant, not macro algae and in general green. Note if epiphytes present.
MAC	MACRO ALGAE CALCAREOUS	Large algae with a calcium carbonate framework
MA	MACRO ALGAE NON CALCAREOUS	Large algae without a calcium carbonate framework
COA	CYANO BACTERIA AND OTHER ALGAE	Small algae / microalgae with no distinct morphology. May be filamentous
SU	SUBSTRATE	Anything which forms the reef bottom and which has not been colonized by coral, algae or seagrass on top.
O	OTHER	Anything which is not a plant, coral

		or any substrate categories listed here
TWS	TAPE, WAND, SHADOW	View of the bottom obscured by field instrument or shadow, out of focus, or an overview photo
Sub catgeories		
Coral		
C_LBC	Live Branching Coarse	Branching but you can stick your fingers through (Veron et al 2000)
C_LBF	Live Branching Fine	Branching but you cannot stick your fingers through (Veron et al 2000)
C_LD	Live Digitate	Small finger-like projections
C_LE	Live Encrusting	A layer of coral which grows over a hard substrate (Dead Coral or Rock) (Veron et al 2000)
C_LF	Live Foliose	Leaf like (Veron et al 2000)
C_LFL	Live Free Living	Disk like or free living; coral can move (Veron et al 2000)
C_LM	Live Massive	Massive, hard, thick, round, big or also sub-massive. From a distance it looks like one complete shape. (Veron et al 2000)
C_LSM	Live Sub Massive	Single part which you can pull out of base or sticks out like a single finger (Veron et al 2000), columnar, finger-like projections thicker than digitate
C_LT	Live Tabular	Looks like a table and not like a little bush, it is flat on the top and it is solid or perforated (Veron et al 2000)
Soft Coral		
LSC	Live Soft	Coral with no hard skeleton
Dead Coral		
DC_DSTT	Dead Tabular Turf	Solid plate-like coral overgrown with turf (small layer of algae)
DC_DBCC	Dead Branching Coarse CCA	Branching but you can stick your fingers through; overgrown with crustose coralline algae
DC_DBCT	Dead Branching Coarse Turf	Branching but you can stick your fingers through; overgrown with turf (small layer of algae)
DC_DBFC	Dead Branching Fine CCA	Branching but you cannot stick your fingers through; overgrown with crustose coralline algae
DC_DBFT	Dead Branching Fine Turf	Branching but you cannot stick your fingers through; overgrown with turf (small layer of algae)
DC_DDC	Dead Digitate CCA	A layer of digitate coral which grow over a hard substrate (dead coral or rock); overgrown with crustose coralline algae
DC_DEC	Dead Encrusting CCA	A layer of encrusting coral which grow over a hard substrate (dead coral or rock); overgrown with crustose coralline algae
DC_DET	Dead Encrusting Turf	A layer of encrusting coral which grow over a hard substrate (dead

		coral or rock); overgrown with turf algae
DC_DFC	Dead Foliose CCA	Leaf like; overgrown with crustose coralline algae
DC_DFT	Dead Foliose Turf	Leaf like overgrown with turf (small layer of algae)
DC_DFLC	Dead Free Living CCA	Free living coral, can move; overgrown with crustose coralline algae
DC_DFLT	Dead Free Living Turf	Free living coral, can move; overgrown with turf (small layer of algae)
DC_DMC	Dead Massive CCA	Massive, hard, thick, round, big, - from a distance it looks like one complete shape. Overgrown with crustose coralline algae
DC_DMT	Dead Massive Turf	Massive hard thick round big - from a distance it looks like one complete shape. Overgrown with turf (small layer of algae)
DC_DSMC	Dead Sub Massive CCA	Single part which you can pull out of base or sticks out like a single finger; columnar, overgrown with crustose coralline algae
DC_DSMT	Dead Sub MassiveTurf	Single part which you can pull out of base or sticks out like a single finger, columnar; overgrown with turf (small layer of algae)
DC_DSTC	Dead Tabular CCA	Tabular coral overgrown by crustose coralline algae
DC_DDT	Dead Digitate Turf	Digitate coral overgrown by turf algae
Seagrass		
SG_CR	*Cymodocea rotundata*	Strap-like leaf, leaftip rounded without distinct serrated edge (Waycott et al. 2004)
SG_CS	*Cymodocea serrulata*	Strap-like leaf, leaftip rounded with serrated edge (Waycott et al. 2004)
SG_HU	*Halodule uninervis*	Straplike leaf, leaf tip tri-dentate or pointed (Waycott et al. 2004)
SG_HO	*Halophila ovalis*	Oval to oblong leaf, leaf margins smooth, no leaf hairs (Waycott et al. 2004)
SG_HS	*Halophila spinulosa*	Obvious vertical stem with more than two leaves, leaves arranged opposite in pairs, leaf margin serrated (Waycott et al. 2004)
SG_D	Seagrass detritus	Dead seagrass floating around on benthos
SG_OT	Seagrass – Species Unknown	Unknown species of seagrass
SG_SI	*Syringodium isoetifolium*	Cylindrical leaf shape, leaf tip pointed (Waycott et al. 2004)
SG_ZM	*Zostera muelleri*	Strap-like leaf, leaves always arise directly from rhizome, leaf with 3-5 parallel veins (Waycott et al. 2004)

Macro Algae Calcareous		
MAC_H	*Halimeda sp.*	Green calcareous algae, form looks like little leafs which appear to be stacked on top of each other
MAC_O	Macroalgae - Calcareous – Species Unknown	Unknown species of calcareous macroalgae
MAC_P	*Padina sp.*	White calcareous semi-circle shapes in leaf like forms
MAC_U	*Udotea sp.*	Green calcareous fan-like shape
Macro Algae Non Calcareous		
MA_CA	*Caulerpa sp.*	Green, grape-like, connected through green root-like structures branching over the substrate
MA_TG	*Chlorodesmis sp.*	Bunch of green grass-like blades, also known as turtle weed or turtle grass (TG)
MA_CH	*Chnoospora sp.*	Intricate spongy clumps or mats, usually 15 cm or more across, made up of repeatedly forked and entangled braches which may be somewhat flattened but not ribbon-like
MA_CS	*Colpemenia sinuosa*	Rounded or irregular gas filled vesicles, usually 2-6 cm diameter
MA_DI	*Dictyota sp.*	Brown branching algae with small round tips
MA_HY	*Hydroclathrus sp.*	Sac-like thallus with perforations throughout. Resembles a brown, soft Swiss cheese. Few to several cm in length. Net-like structure.
MA_LA	*Laurentia sp.*	Brown,Green, Red looking branching algae oft in little bushes
MA_LO	*Lobophora sp.*	Brown orange semi-circle shapes in leaf like forms
MA_OT	Macro Algae Non-Calcareous - Species Unknown	Unknown species of non-calcareous macroalgae
MA_SA	*Sargassum sp.*	Brown colour, as if floating in the water column due to air bubbles trapped in little chambers
MA_TU	*Turbinaria sp.*	Brown colour looks like *Sargassum* but with little brown trumpets
Cyano bacteria and other algae		
COA_CABR	Branching Coralline Algae	Coralline algae with a branching form
COA_CARO	Crustose Coralline Algae on Rock	Rock with crustose coralline algae
COA_CARU	Crustose Coralline Algae on Rubble	Rubble with crustose coralline algae
COA_MCS	Cyano on Sediment	Hairy strings of cyano bacteria on sand; in general longer and taller then MPB or turf
COA_MCO	Cyano-other	Cyanobacteria on coral, algae, seagrass, or gorgonian

COA_MCRO	Cyano-rock	Cyano-bacteria on rock
COA_MCRU	Cyano-rubble	Cyano-bacteria on rubble
COA_TADE	Dense Turf	Dense enough such that you cannot see the bottom type on which it is growing on
COA_MPS	MPB on Sediment	Microphytobenthos (MPB) on sand where there is sand patches visible (every CPCe point could have MPB but still have sand visible)
COA_MPM	MPB-mat	Microphytobenthos (MPB) is covering completely image and no sand patches are visible . Always 100% cover.
COA_TARO	Turf on rock	Turf not higher than 1 cm overgrowing on a rock
COA_TARU	Turf on rubble	Turf not higher than 1 cm overgrowing on rubble
Substrate		
SU_P	Pavement	Flat, hard bottom with low relief
SU_R	Rock Clean	Cannot be moved, not recognisable as coral, cannot see corallites, nothing growing on it
SU_RU	Rubble	Can be moved, and can be held in one hand
SU_S	Sediment	Can be moved, can be held in one hand but would fall out very easily because it very fine. Previously this was classified as sand,silt or mud
Other		
O_GC	Clam (OGC)	Clam
O_CS	Crown of Thorns (OCS)	Crown of thorns starfish
O_G	Gorgonians (OG)	Gorgonian
O_O	Other Living	Other living benthic organism
O_D	Other Dead	Other dead benthic organism
O_SC	Sea cucumber	Sea cucumber
O_SP	Sponge (OSP)	Sponge
O_SF	Star Fish (OSF)	Starfish
O_UR	Urchins (OUR)	Sea urchin
O_ZO	Zoanthid (OZ)	Zoanthid
TAPE, WAND, SHADOW		
TWS_DK	Don't Know (DK)	Cannot determine substrate cover type
TWS_OF	Out of Focus (OF)	Photo is out of focus
TWS_OV	Overview (OV)	Overview image, not included in photo scoring
TWS_Shade	Shade (Shade)	Picture is in the shade
TWS_Tape	Tape (Tape)	View obstructed by transect tape
TWS_Wand	Wand (Wand)	View obstructed by wand or other instrument/equipment

NOTES (% of photo)		
NB	Coral bleached	Corallites are visible, no turf or coralline algae on top, pale, fluro, and white surface bleaching
NCD	Coral disease	Corallites are visible, no turf or coralline algae on top, and fluro surface bleaching
NCS	Coral scars	Coralites are visible, no turf or coraline algae on top, and completely white bleaching
NSE	Seagrass Epiphyte present	A photosynthetic organism the lives on the surface of seagrass blades
Rugosity (each is photo evaluated as either of the three rugosity types: R1, R2, R3)		
R1	Rugosity Type 1	Small fish have nowhere to hide
R2	Rugosity Type 2	Small fish can hide
R3	Rugosity Type 3	Fish can hide very well