Short introduction to the PaleoReefs-Database (PARED)

Author: Wolfgang Kiessling (wolfgang.kiessling@fau.de)

Abstract of the database

PaleoReefs Database (PARED) is a major resource on fossil reef systems. PARED has been developed by Wolfgang Kiessling since 1995 with the aim to collect data on Phanerozoic reefs in a standardized format and to use those data for tracing patterns and processes in reef development. PARED currently holds data on more than 4000 Phanerozoic reef sites with geological, geographical, and paleontological information on every reef. While mostly developed for research, the database is useful for tracing reefal oil reservoirs through time and space.

Starting this year, the database is finally available online both with a graphic interface and with a MySQL backend. The latter has three levels of access: the public version allows data query and displays basic information, whereas the password-protected versions give access to all data and has a download function. The only difference between the restricted versions is that one allows data entry and modification, whereas the other is read-only.

The kernel of the database is the table *reefs*. This table is linked with the rest of the tables The field names are described below.

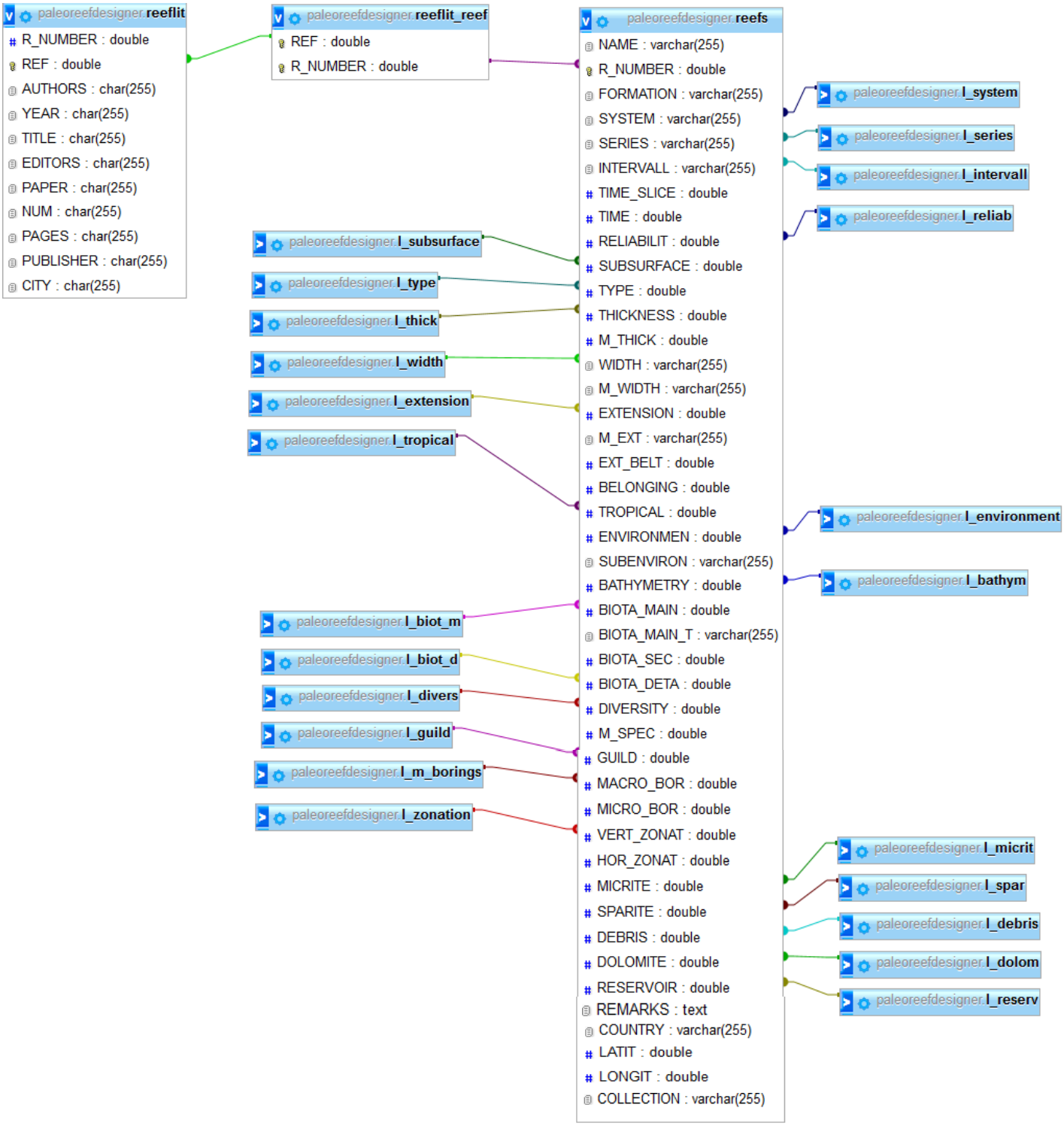
Find additional information in:

Kiessling, W., and Flügel, E., 2002, Paleoreefs - a database on Phanerozoic reefs, *in* Kiessling, W., Flügel, E., and Golonka, J., eds., Phanerozoic Reef Patterns, SEPM Special Publication, p. 77-92.

Or Online at:

http://www.paleo-reefs.pal.uni-erlangen.de/index.php?index=1 (Reefmaps)

http://www.paleo-reefs.pal.uni-erlangen.de/reefs/searchreef_public.php (Data)



Category	Attribute	Field name	Field type	Explanations
General	Reef name (locality)	NAME	Text	e.g. Austria
	Reef number	R_NUMBER	Numerical	Unique value for each reef
Stratigraphy	Age	SYSTEM	Text	e.g. Devonian
		SERIES	Text	e.g. Upper
		INTERVAL	Text	e.g. Frasnian (Finest interval of dating)
		TIME_SLICE	Numerical	32 time slices based on supersequences
		RELIABILIT	Numerical	Reliability of age assignment: 1 = Substage not known; 2 = Stage not precisely known; 3 = Substage precisely identified
Position		LATIT	Numerical	Present day latitude in decimal degrees
		LONGIT	Numerical	Present day latitude in decimal degrees
Outcrop or subsurface data		SUBSURFACE	Numerical	Only well or seismic data available (1) or outcropping reef (0)
Architecture	Reef type	TYPE	Numerical	1 = True reef, 2 = Reef-mound, 3 = Mud mound or bank 4 = Biostrome 0= Unknown reef type
	Size	THICKNESS	Numerical	1 = Less than 10 m thick (< 10 m); 2 = 10 to 100 m thick (10-100 m); 3 = More than 500 m thick 4 = More than 500 m thick; 0 = Unknown thickness.
		WIDTH	Numerical	1 = Less than 20 m wide(< 10 m); 2 = 10 - 100 m wide (10-100 m); 3 = 101-1000 m wide (> 100 m);

Category	Attribute	Field name	Field type	Explanations
				4 = More than 1000 m wide(> 500 m) 0 = Unknown width.
		EXTENSION	Numerical	1 = Less than 20 m (< 10 m); 2 = 10-100m; 3 = More than 100 m (> 100 m); 4 = More than 1000 m (> 1000 m); 0= Unknown extension
		M_THICK	Numerical	Thickness in meters
		M_WIDTH	Numerical	Width in meters
		M_EXT	Numerical	Length in meters
	Reef tract	EXT_BELT	Numerical	Extent of reef tract (same age, same type, same environment in km)
		BELONGING	Numerical	To which type reef in the reef tract is the reef entry belonging.
Setting	Environment	ENVIRONMEN	Numerical	Main environmental setting of reef: 1 = intra shelf/ platform; 2 = shelf/ platform margin; 3 = slope/ramp; 4 = basin.
		SUBENVIRON	Text	1a- Shallow intra-platform; 1b- Intraplatform basin; 1c- Epeiric sea; 1d- Marginal marine-coastal- siliciclastic shelf; 1e- Open-marine shelf; 2a- Margin of shallow basins (platform margin); 2b- Margin of deep basins (shelf margin); 2c- Atoll (circular structure); 3a- Upper slope or inner ramp; 3b- Deeper slope or outer ramp; 4a- Shallow basin; 4b- Deep basin (> 200 m).

Category	Attribute	Field name	Field type	Explanations
	Bathymetry	BATHYMETRY	Numerical	1 = Above fair weather wave base; 2 = Below fair weather wave base; 3 = below storm wave base; 0= Unknown
Paleontology	Biotic composition	BIOTA_MAIN	Numerical	Reef builder 1 = Corals; 2 = Algae; 3 = Microbes; 4 = "Stromatoporoids"; 5 = Rudists; 6 = Calcisponges; 7 = Bryozoans; 8 = Serpulids, worms; 9 = Tubiphytes; 10 = Archaeocyaths; 11 =Siliceous sponges; 12 = Foraminifera; 13 = Echinoderms; 14 = Brachiopods; 15 = Non-rudist bivalves; 0 = Unknown.
		BIOTA_SEC	Numerical	Reef builder 1 = Corals; 2 = Algae; 3 = Microbes; 4 = "Stromatoporoids"; 5 = Rudists; 6 = Calcisponges; 7 = Bryozoans; 8 = Serpulids, worms; 9 = Tubiphytes; 10 = Archaeocyaths; 11 =Siliceous sponges;

Category	Attribute	Field name	Field type	Explanations
				12 = Foraminifera; 13 = Echinoderms; 14 = Brachiopods; 15 = Non-rudist bivalves; 0 = Unknown.
		BIOTA_DETA	Numerical	Association of reef builders (96 types): 1 = Scleractinian corals - red algae - (hydrozoans) - (foraminifera) - (microbes) - (sponges) 2 = Corals only 3 = Corals - calcareous sponges (hydrozoans) - solenoporaceans - (Tubiphytes) - (bryozoans) 4 = Siliceous sponges - echinoderms - scleractinian corals - worms 5 = …..
		COLLECTION	Numerical	Collection number in the Paleobiology Database (www.paleobiodb.org)
	Diversity	DIVERSITY	Numerical	1 = Less than 6 reef building species; 2 = 6 to 24 reef building species; 3 = 25 or more reef building species; 0 = Unknown Diversity
		M_SPEC	Numerical	Number of species (including calcimicrobes)
	Dominant guild	GUILD	Numerical	1= Constructor guild; 2 = Baffler guild; 3 = Binder guild; 4 = microbial precipitation; 0 = Unknown guild.
	Bioerosion	MACRO_BOR	Numerical	Macroborings abundant (2), present (1) or not observed (0)
		MICRO_BOR	Numerical	Microborings abundant (2), present (1) or not observed (0)
	Zonation	VERT_ZONAT	Numerical	1 = Low zonation; 2= Medium zonation;

Category	Attribute	Field name	Field type	Explanations
				3 = Pronounced zonation; 0 = Unknown zonation.
		HOR_ZONAT	Numerical	1 = Low zonation; 2= Medium zonation; 3 = Pronounced zonation; 0 = Unknown zonation.
Petrography		MICRITE	Numerical	Relative amount of micrite with respect to amount of biota and amount of sparite. 1 = Less than 30% micrite; 2 = 30%-60% micrite; 3 = more than 60% micrite; 0 = Unknown micrite content.
		SPARITE	Numerical	Relative amount of marine or very early diagenetic sparite with respect to amount of biota and amount of micrite: 1 = Less than 30% sparite; 2 = 30%-60% sparite; 3 = more than 60% sparite; 0 = Unknown sparite content.
		DEBRIS	Numerical	Relative amount of marine or very early diagenetic sparite with respect to amount of biota and amount of micrite: 1 = Low production of reefal debris; 2 = Medium production of reefal debris; 3 = High production of reefal debris. 0 = Unknown debris production.
		DOLOMITE	Numerical	Intense dolomitization present (1) or absent (0)
		RESERVOIR	Numerical	2 = Reef is actual hydrocarbon reservoir; 1 = Reef has reservoir potential but no hydrocarbon; 0 = No or unknown reservoir potential.

References Utilizing PARED (selection)

Book

Kiessling, W., Flügel, E., Golonka, J., 2002. Phanerozoic Reef Patterns, SEPM Special Publication, Tulsa, p. 775. (edited book, where PARED has been used in every chapter)

Book chapters and journal articles

Martindale, R.C., Bottjer, D.J., Corsetti, F.A., 2012. Platy coral patch reefs from eastern Panthalassa (Nevada, USA): Unique reef construction in the Late Triassic. Palaeogeography, Palaeoclimatology, Palaeoecology 313-314, 41-58.

Kiessling, W., Simpson, C., 2011. On the potential for ocean acidification to be a general cause of ancient reef crises. Global Change Biology 17, 56-67.

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