

ATLAS OF CARBONATE CONTOURITES, VERSION 2: PLATFORM ARCHITECTURE AND GLOBAL DISTRIBUTION

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KEY FINDINGS

- The updated georeferenced database consists of 82 carbonate contourite examples worldwide, including 17 newly documented examples.
- The database includes 60 submarine contourite systems and 22 outcrop examples.
- The database includes contourite drift type, age, water depth, drift dimensions, maximum thickness, carbonate factory type, carbonate platform type, and references.

PROJECT RATIONALE

Carbonate contourites are increasingly recognized as important components of carbonate depositional systems, yet their global distribution and relationship to carbonate platform architecture remain poorly constrained. Existing contourite compilations largely emphasize siliciclastic and mixed systems, limiting global-scale comparison of carbonate-dominated deposits. Building on previous versions of the Atlas of Carbonate Contourites, this study expands the georeferenced database with 17 newly documented examples and introduces carbonate platform type as an additional parameter. The expanded atlas provides a standardized reference tool for documenting carbonate contourites and for exploring whether platform architecture is associated with differences in contourite occurrence, morphology, dimensions, thickness, age, and depositional setting.

DATA COMPILATION

The Eberli and Betzler (2019) compilation served as the foundation for the worldwide Atlas of Carbonate Contourites. Global contourite datasets from Claus et al. (2014), Thran et al. (2018), and Wilckens et al. (2023) were cross-referenced with relevant literature, with siliciclastic and mixed-system contourites excluded where appropriate. The updated database contains 82 carbonate contourite examples: 60 submarine systems and 22 outcrop occurrences. Geographic attributes include latitude, longitude, region, and sub-region. Geological attributes include platform name, carbonate factory type, and the newly added carbonate platform type. Drift parameters include water depth, age, drift type, dimensions, and maximum thickness. Carbonate platform type is retained as a separate variable from carbonate factory type so that carbonate production style and platform architecture can be evaluated independently.

Location	Region	Sub-region	Longitude	Latitude	Water depth (m)	Drift name	Onset of drift
Danish Basin	Northern North Atlantic	Baltic Sea	56.4	11.4	400 - 600	Danish Basin	Late Cretaceous
Porcupine Seabight	Northeast Atlantic	Porcupine Seabight	50.0	-14.0	700 - 1200	Porcupine Seabight contourite	L. Pliocene
Miami Terrace	Western North Atlantic	Eastern United States	25.5	-79.7	300 - 800	Pourtales Drift	Miocene
Pourtales Terrace	Western North Atlantic	Eastern United States	24.4	-80.5	300 - 800	Pourtales Drift	Middle Miocene
South Straits of FL	Western North Atlantic	Eastern United States	23.6	-82.0	1000 - 2100	Pourtales Drift	L. Pleistocene
Santaren Channel	Western North Atlantic	Caribbean	23.9	-79.4	658 - 1375	Santaren Drift	Middle Miocene
W Great Bahama Bank	Western North Atlantic	Caribbean	24.5	-79.4	240 - 550	Western GBB Drift	Pliocene
NW Great Bahama Bank	Western North Atlantic	Caribbean	26.3	-79.3	200 - 800	GBB Drift	Miocene
Little Bahama Bank	Western North Atlantic	Caribbean	27.6	-79.2	300 - 700	LBB Drift	Miocene
Cay Sal Bank	Western North Atlantic	Caribbean	24.2	-79.9	300 - 700	Cay Sal Drift	Middle Miocene
Nicaraguan Rise	Western North Atlantic	Caribbean	16.1	-81.8	250 - 700	Nicaraguan Rise	Middle Miocene
Yucatan Platform	Western North Atlantic	Gulf of Mexico	22.3	-86.9	500 - 720	Yucatan Drift	L. Pleistocene
Yucatan Platform	Western North Atlantic	Gulf of Mexico	23.3	-86.8	300 - 1100	Yucatan Drift	Middle Miocene
DeSoto Canyon	Western North Atlantic	Gulf of Mexico	29.4	-87.9	400 - 1000	DeSoto CDS	Middle Miocene
Cape Gargano	Mediterranean	Adriatic Sea	41.7	17.1	120	SW Adriatic margin CDS	Pliocene
East Mallorca, Spain	Mediterranean	Balearic Sea	39.6	3.2		Mallorca CDS	Upper Jurassic
SW Mallorca, Spain	Mediterranean	Balearic Sea	39.0	2.8	250 - 600	Mallorca CDS	Pliocene
SW Mallorca, Spain	Mediterranean	Balearic Sea	39.0	2.8	150 - 275	Mallorca CDS	Pliocene
Eastern Malta Plateau	Mediterranean	West Mediterranean	36.3	15.5	300 - 320	Malta Plateau Drift	Neogene
Israel	Mediterranean	East Mediterranean	32.3	34.7		Talme Yafe Formation	Late Cretaceous

Figure 1: Compilation of global carbonate contourites in Excel format with listed geographic, drift, carbonate factory, and carbonate platform parameters.

ACCESSING DATA

We provide three data access options: Excel, KML, and Power BI formats.

Google Earth Database structure

The KML file is readily available for review in Google Earth, facilitating comparison with Claus et al.'s (2014) shapefile. The database has been systematically organized based on the onset of drift during the Paleozoic, Cretaceous, or Neogene periods. Each location pin is annotated with a reference link for further academic rigor.

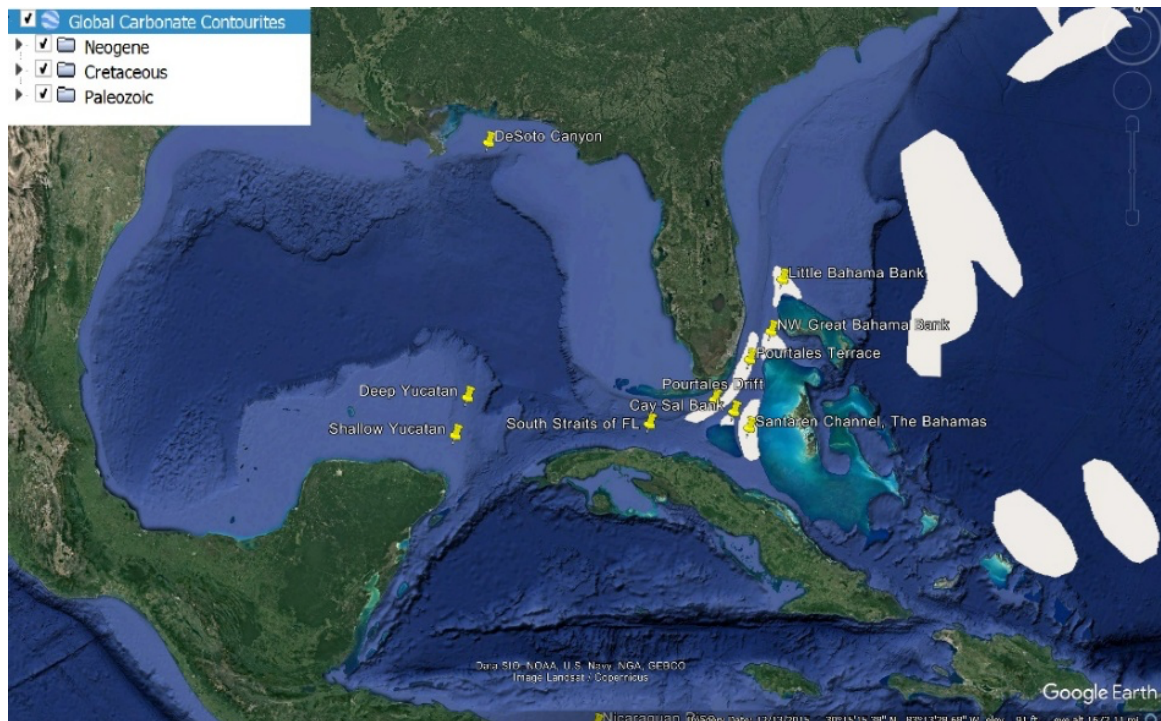


Figure 2: Compilation of large contourite deposits in the present ocean basins (white polygons; Claus et al., 2014) and locations of carbonate contourites (yellow pins; this study).

Power BI Database structure

The Power BI format provides interactive visualizations of the global distribution of carbonate contourites and allows users to explore relationships among database parameters. The world map can be filtered by geographic and geological attributes, while charts summarize variables such as carbonate factory type, carbonate platform type, and maximum thickness. The expanded database therefore supports both rapid visualization and comparative exploration of potential relationships between platform architecture and contourite characteristics.

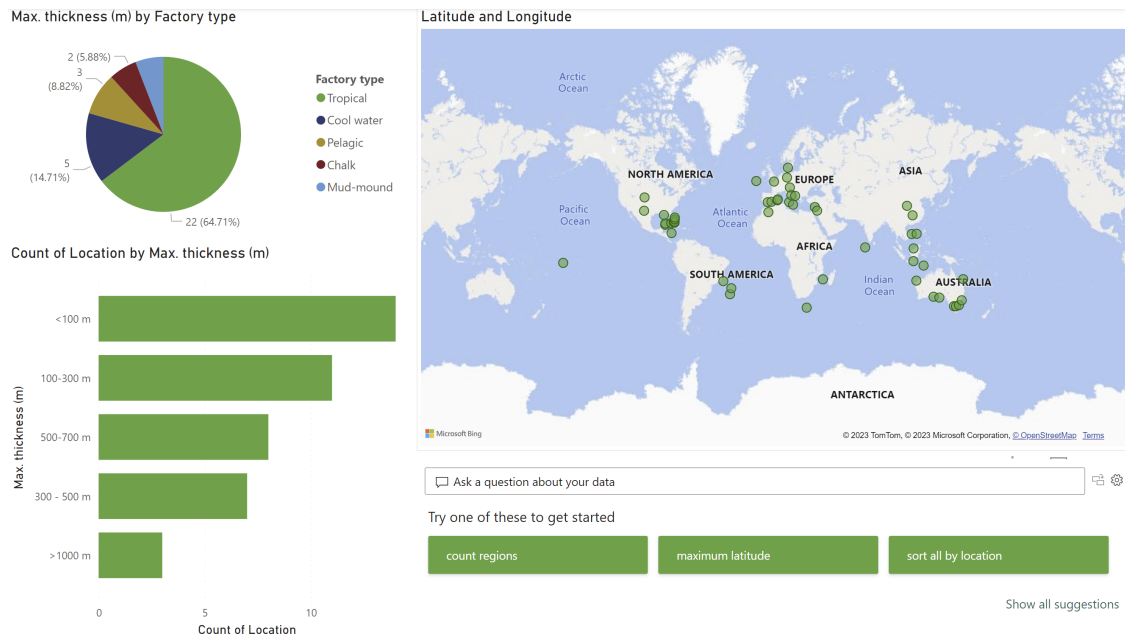


Figure 3: Power BI report displaying carbonate contourite locations on an interactive map with a search bar to explore parameters. Interactive charts allow comparison of carbonate factory type, carbonate platform type, maximum thickness, and other drift characteristics.

CONCLUSIONS AND IMPLICATIONS

The updated Atlas of Carbonate Contourites compiles 82 published carbonate contourite examples and expands the database from a global inventory toward a comparative framework for investigating geological controls on carbonate contourite development. The addition of carbonate platform type provides a first-order measure of platform architecture that can be compared with drift morphology, dimensions, thickness, age, and water depth. This approach allows future analyses to evaluate whether particular platform architectures are preferentially associated with specific carbonate contourite geometries or depositional settings. Rather than treating carbonate contourites solely as products of bottom-current circulation, the atlas provides a framework for considering them within an integrated platform-slope-current depositional system.

REFERENCES

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