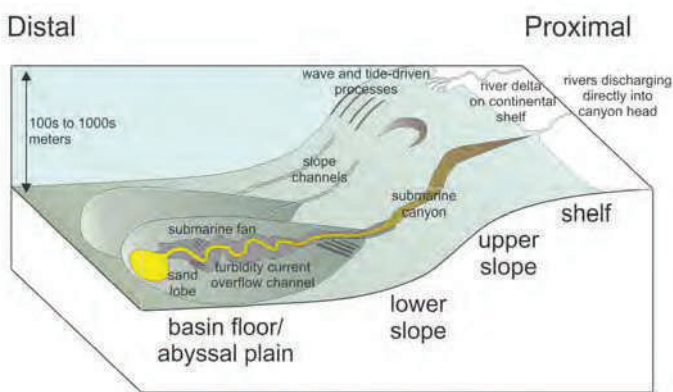


PetroStrat carry out detailed palaeo-environmental interpretations based upon a combination of microfossil criteria. Fully quantitative logging techniques employed as standard by our biostratigraphers (multi-disciplinary) routinely, and at wellsite permit detailed information based upon the interplay of environmental indices.



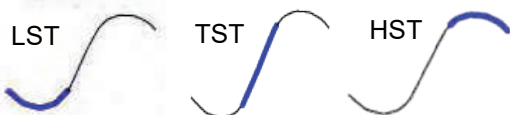
Why are microfossils important for palaeoenvironmental interpretation?

- Accurate identification of depositional environments is of major importance to the petroleum industry. Fossil assemblages indicate energy levels at the sediment/water interface detailing deposition of turbidites, debrites or hemipelagic sediments, linked directly to basin geometry.
- Aids understanding of sedimentary basin palaeogeography..
- Provides information on the geometry and distribution of potential reservoirs.

How do microfossils aid sequence stratigraphic interpretation?

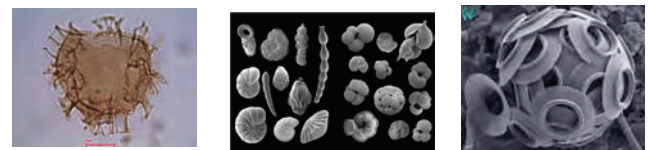
Microfossil distributions combined with wireline logs allow the interpretation of the following sequence parameters:

- Lowstand Systems Tracts (LST)
- Transgressive Systems Tracts (TST)
- Maximum Flooding Surfaces (MFS)
- Highstand Systems Tracts (HST)



What role do microfossils play in palaeobathymetry?

The interplay between microfaunal distribution (abundance and diversity) and sea levels is carefully assessed. Particular benthonic foraminifera proliferate at different levels within marginal to deep marine environments and are identified on their Morphogroup characteristics.



Distribution of planktonic microfossils (foraminifera, radiolaria, diatoms, calcareous nannoplankton & dinoflagellate cysts) in the pelagic regime reflects shore distance and degree of open marine connectivity, distinguished as 3 main zones:

- **Littoral** (depths vary with tidal range).
- **Neritic** (0-200m)
- **Deep-sea (bathyal – hadal)** (>200m)

In the vertical dimension the photic zone (0-150m) represents the maximum penetration of light, decreasing with depth

Environment	Zone	Depth
Splash & storm zone	Supratidal	Above 0m
Intertidal (mean tidal range)	Littoral	Depth varies with tidal range
Proximal shelf	Inner neritic	0m-50m
Middle shelf	Middle neritic	50m-100m
Distal shelf	Outer neritic	100m-200m
Upper slope (deep sea)	Upper bathyal	200m-800m
Middle slope	Middle bathyal	600m-1000m
Lower slope	Lower bathyal	1000m-4000m
	Abyssal	4000m-6000m
	Hadal	>6000m



How can different microfossil groups be utilised to interpret palaeoenvironments?

Micropalaeontology:

Planktonics (foraminifera, diatoms & radiolaria):

- Degree of open marine influence.
- Distance to shore.
- Surface water conditions.

Benthonics (foraminifera & ostracods):

- Water depth.
- Conditions at the sediment/water interface, including degree of oxygenation.
- Rates of sedimentation.
- Calcium carbonate dissolution.

Nannopalaeontology:

- Degree of open marine influence.

Palynology:

Spores & Pollen (terrestrial):

- Climate.
- Hinterland conditions.
- Terrigenous input.

Freshwater algae (non-marine):

- Freshwater influence / fluvial discharge.

Marine microplankton:

- Degree of open marine circulation.

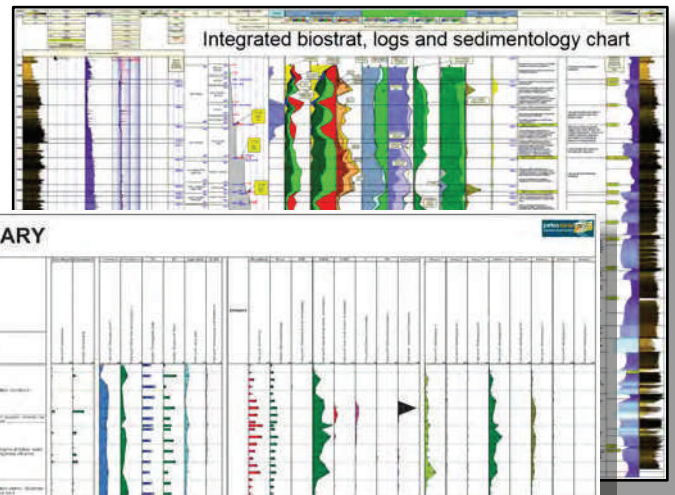
Methodology

Fully quantitative analysis, using standard processing techniques for each discipline, including:

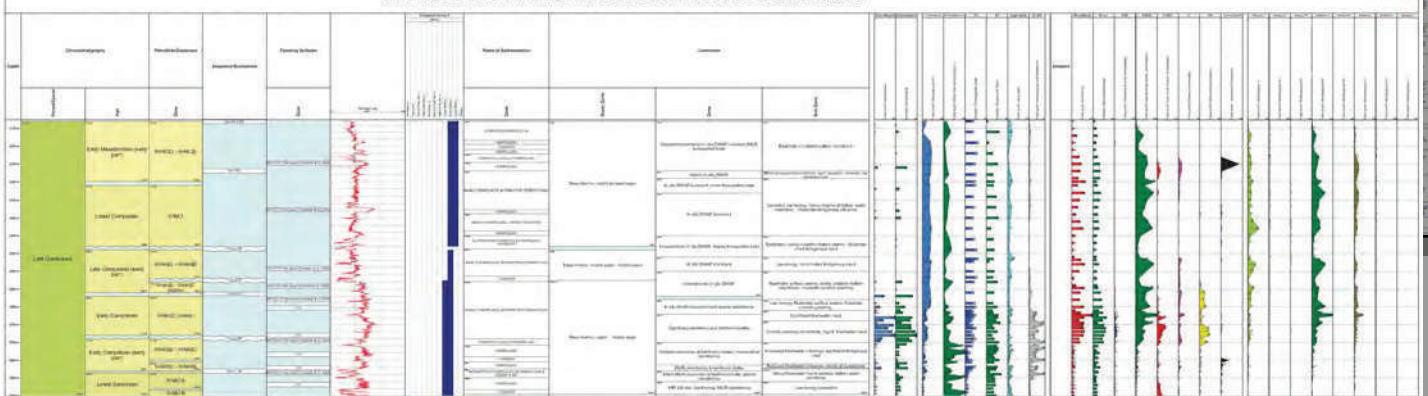
- Micropalaeontology of marginal to fully marine argillaceous sediments, clastics and soft carbonates.
- Thin-section of hard carbonates.
- Nannopalaeontology of fully marine sediments alternating with micropalaeontology samples for best coverage.
- Palynology of fully marine, marginal marine and non-marine sediments.
- Sample spacing 20m (routine), 5-10m (over critical intervals).

Distribution data and palaeoenvironmental summary logs are delivered in StrataBugs™ format.

Quantitative microfossil data incorporated into PetroStrat Integrated Biostrat, Logs & Sedimentology Data Summary Chart to strongly reflect changes in the depositional environment.



TYPICAL PALAEOENVIRONMENTAL SUMMARY



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ISO 9001:2008



OHSAS 18001:2007



ISO 14001:2004

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