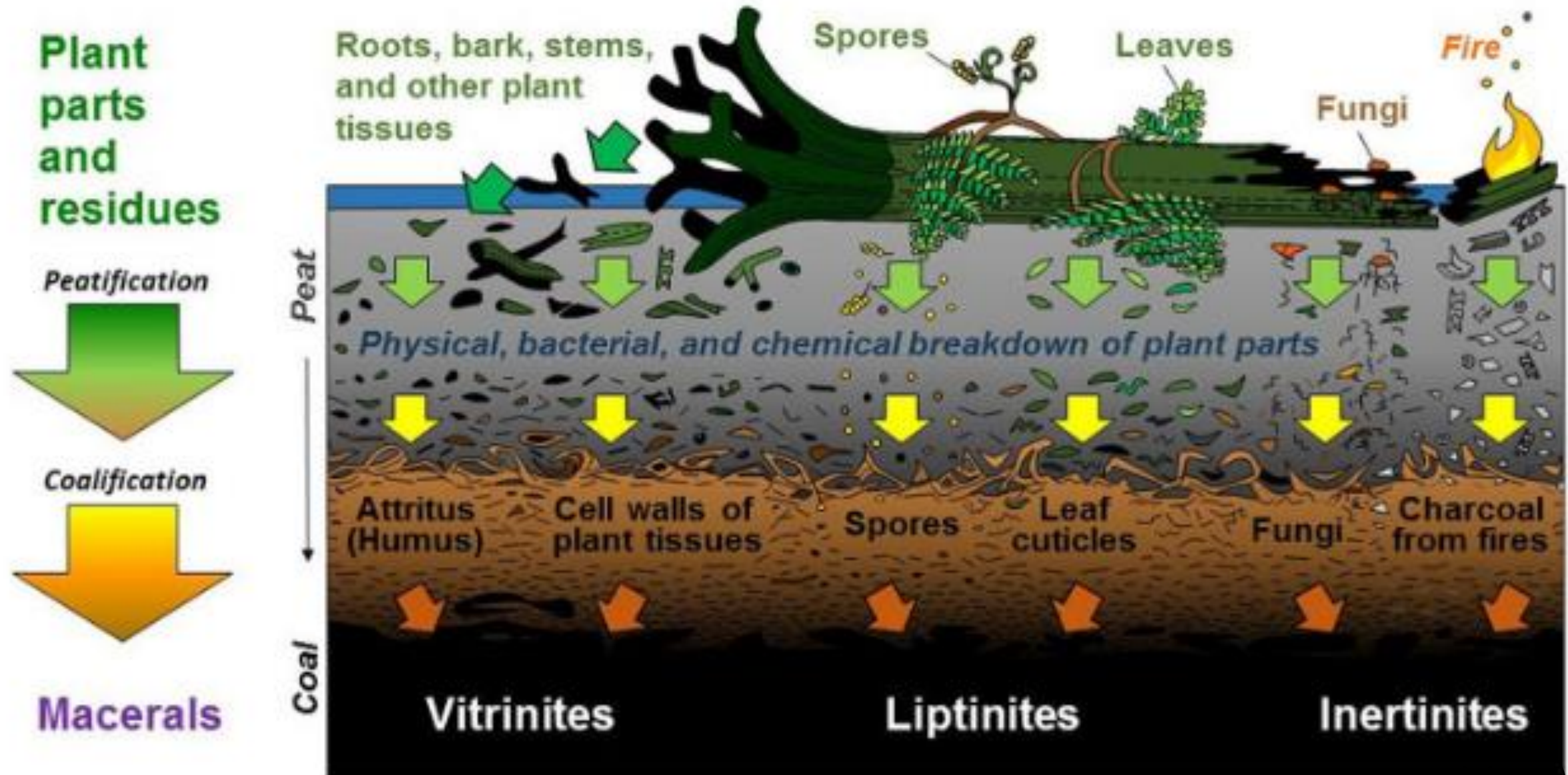


Carvão mineral

GSA0252-Sedimentologia

Carvão: rocha combustível composta por material carbonoso (> 50% em peso ou > 70% em volume) derivado de plantas (**macerais**) e similar aos depósitos de **turfa** (Schopf, 1956).



Turfa (peat)

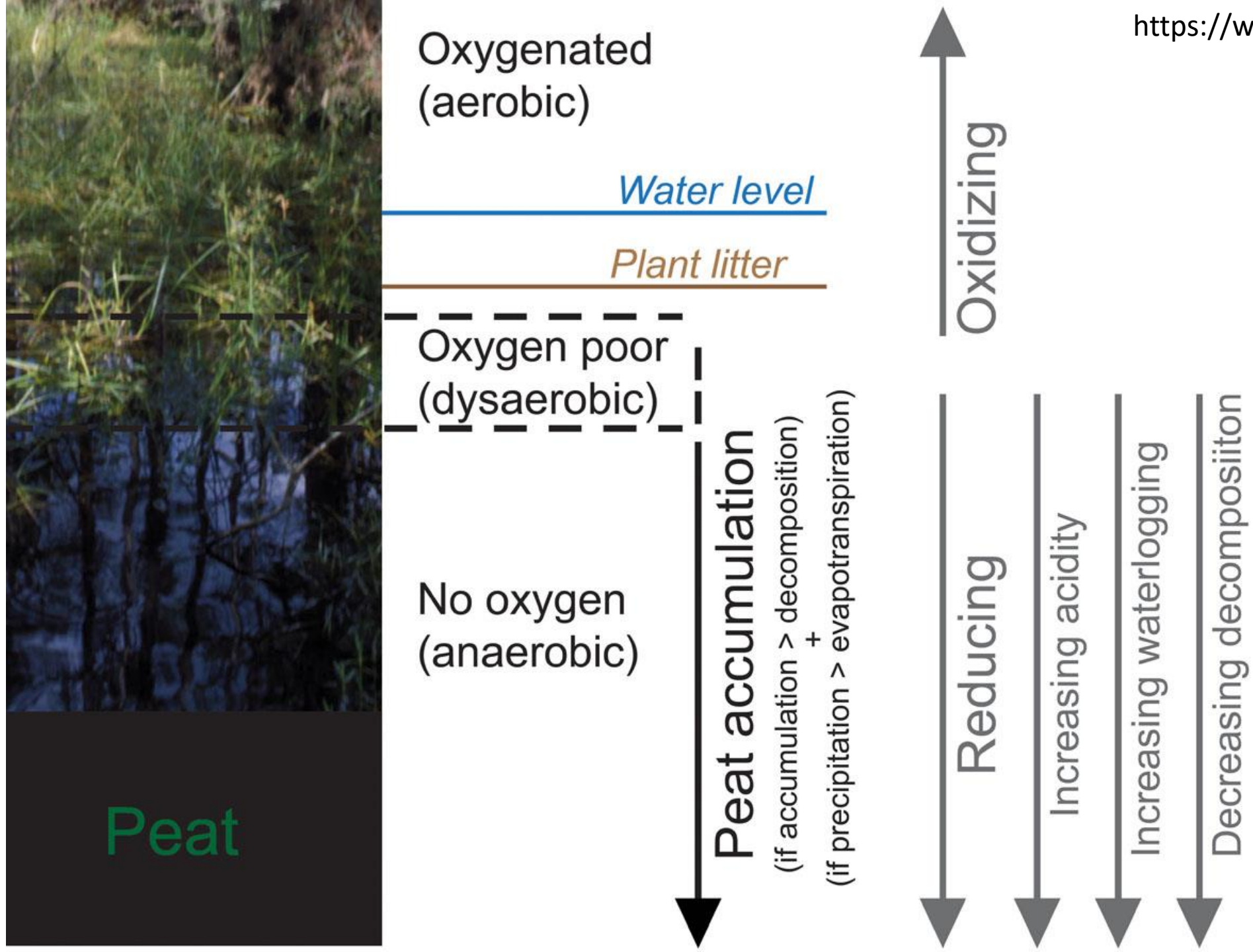


Chapman et al. (2003)

Tufa



Ribeiro (2014)



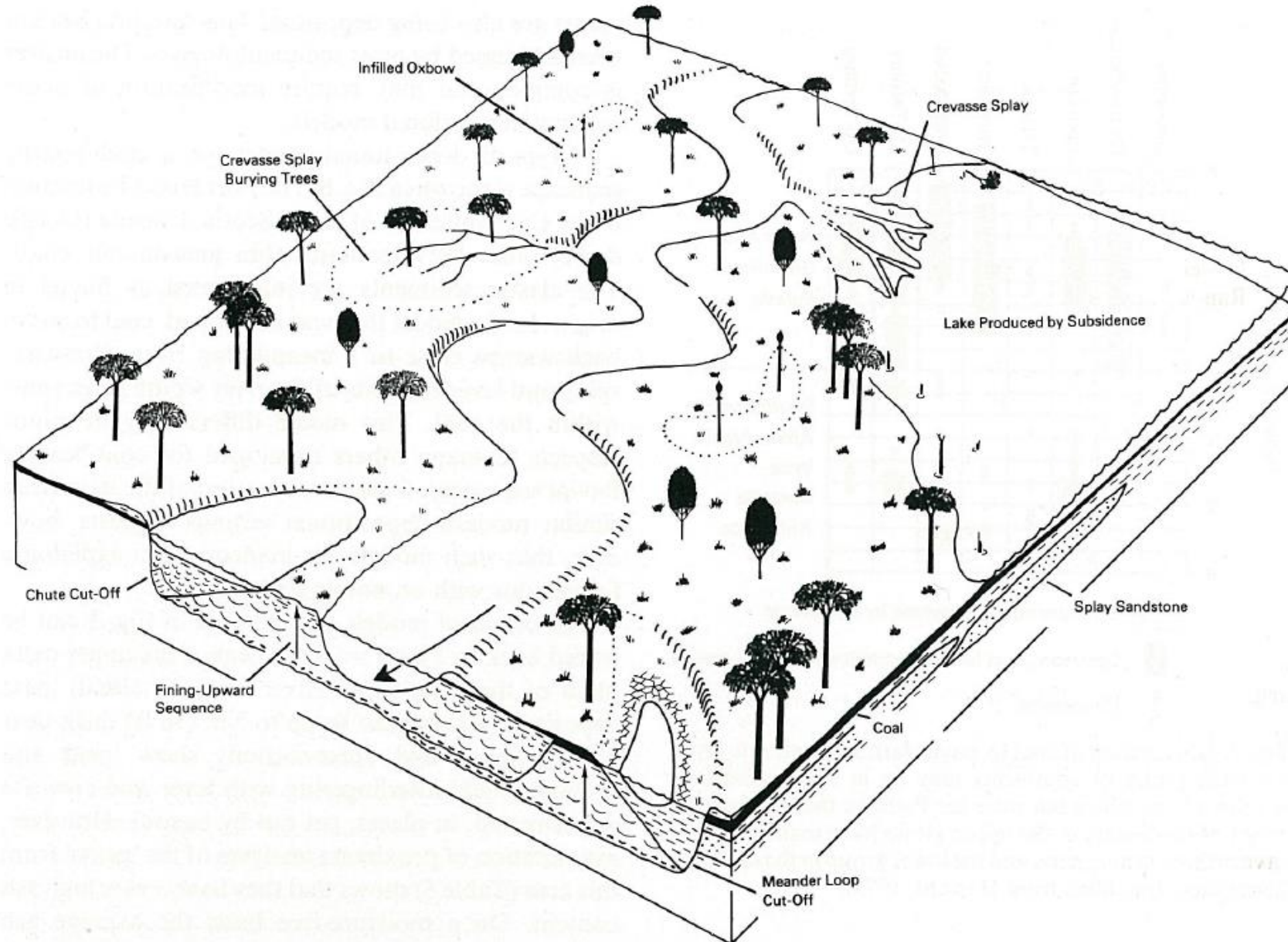


Turfa- Dinamarca - Idade do Bronze (3300-1200 AC)

Table 3. The lithotypes of humic and sapropelic coals

Lithotype	Description	Composition	
Vitrain	Black, very bright lustre, thin layers break cubically, thick layers have conchoidal fracture	Vitrinite macerals with < 20% exinite macerals	
Clarain	Finely stratified layers of vitrain, durain and, in some cases fusain; medium lustre	Variable	
Durain	Black or grey, dull, rough fracture surfaces	Mainly inertinite and exinite macerals	
Fusain	Black, silky lustre, friable and soft	Mainly fusinite	
Cannel coal	Black, dull, lustre may be 'greasy', breaks with conchoidal fracture	Fine maceral particles, usually dominated by sporinite	
Boghead coal	Black or brown, dull, homogeneous, breaks with conchoidal fracture, lustre may be 'greasy'	Dominated by alginite	

Orgânico vs Inorgânico (cinza/ash)

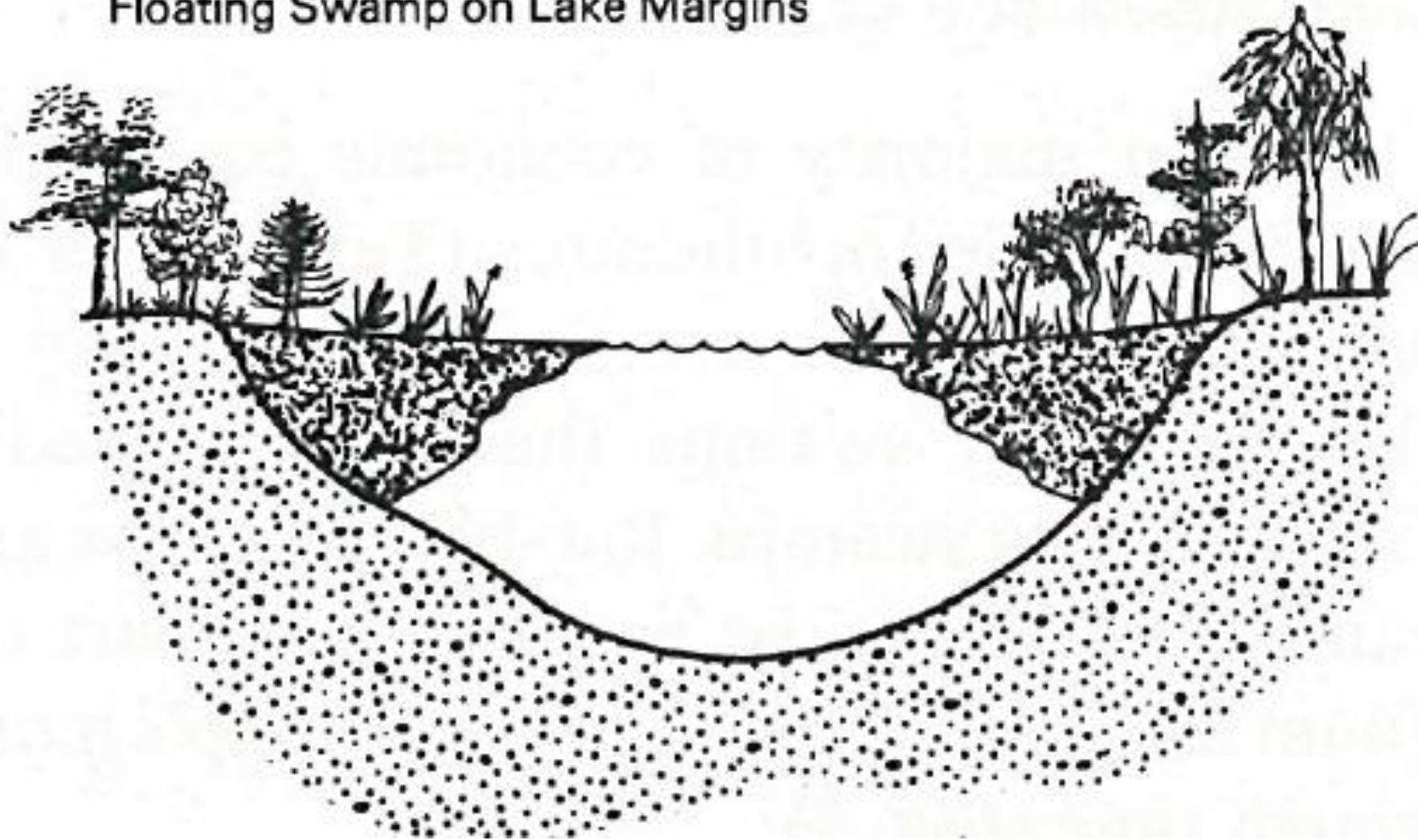


Composição da turfa

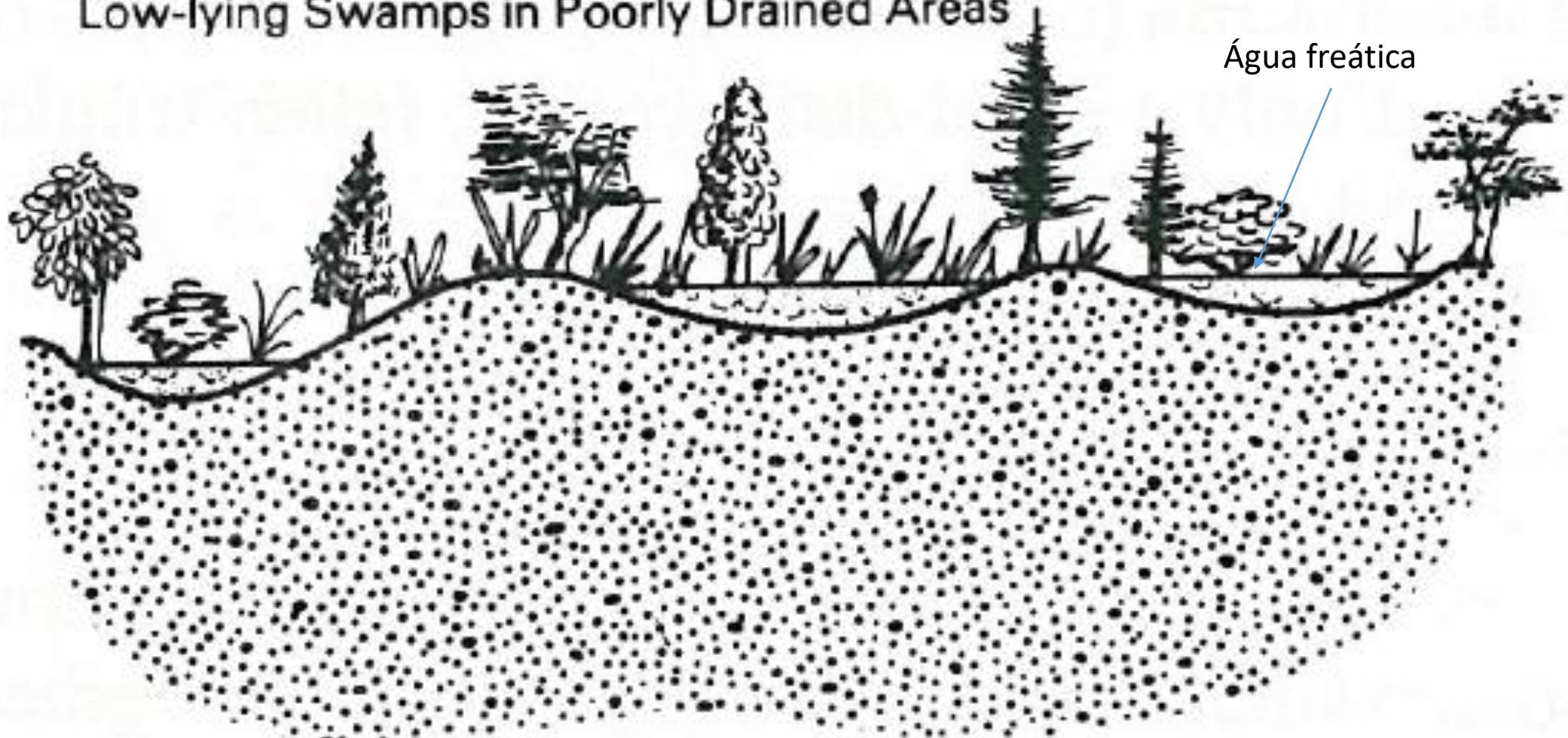
Composição de turfas da região de New Orleans (Fisk, 1960)

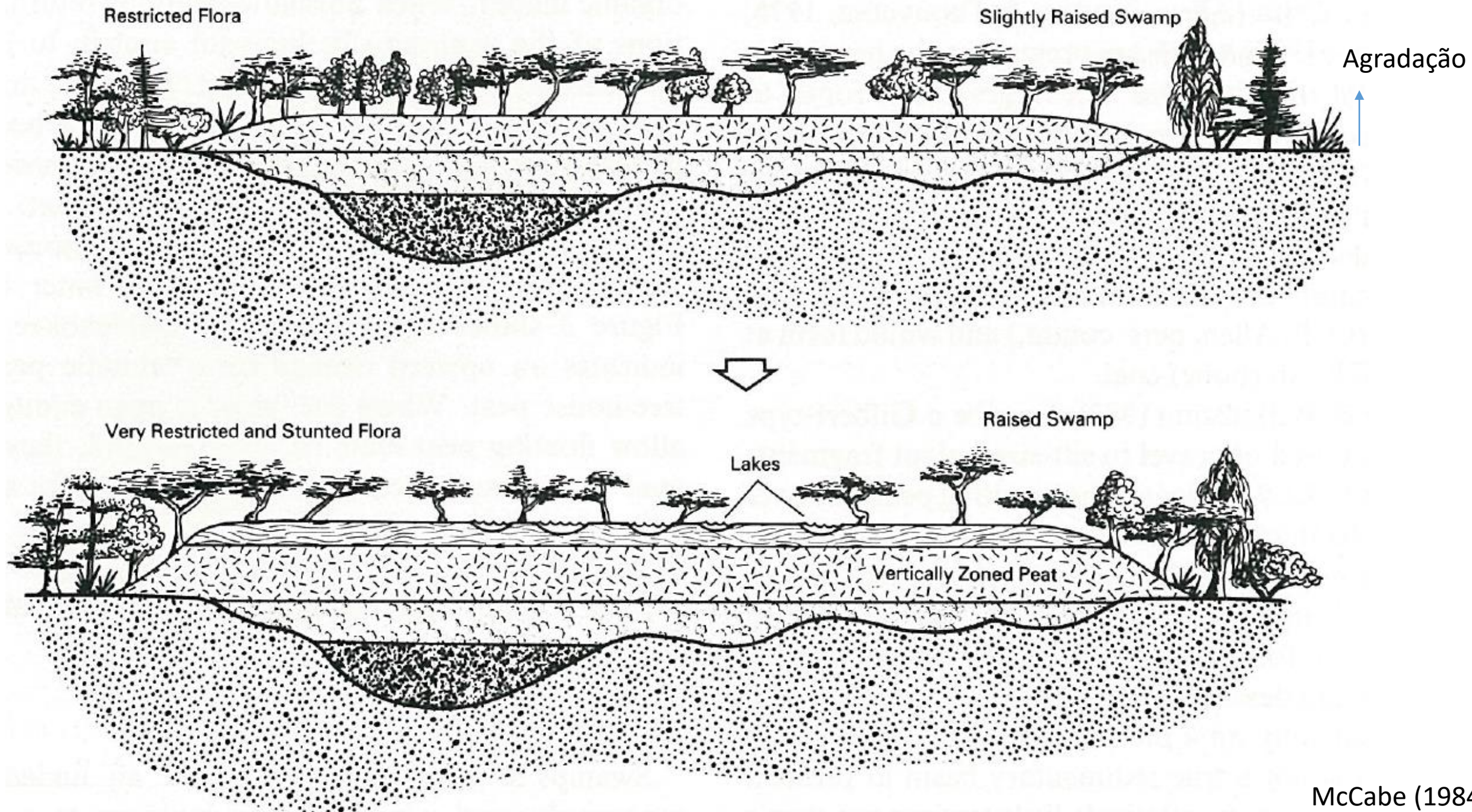
	Máximo (%)	Mínimo (%)	Média (%)
Umidade	76.3	43.2	68.7
Voláteis	8.8	3.6	6.8
Carbono	2.2	0.3	1.4
Enxofre	0.7	0.3	0.4
Cinza	52.5	13.2	22.6

Floating Swamp on Lake Margins



Low-lying Swamps in Poorly Drained Areas





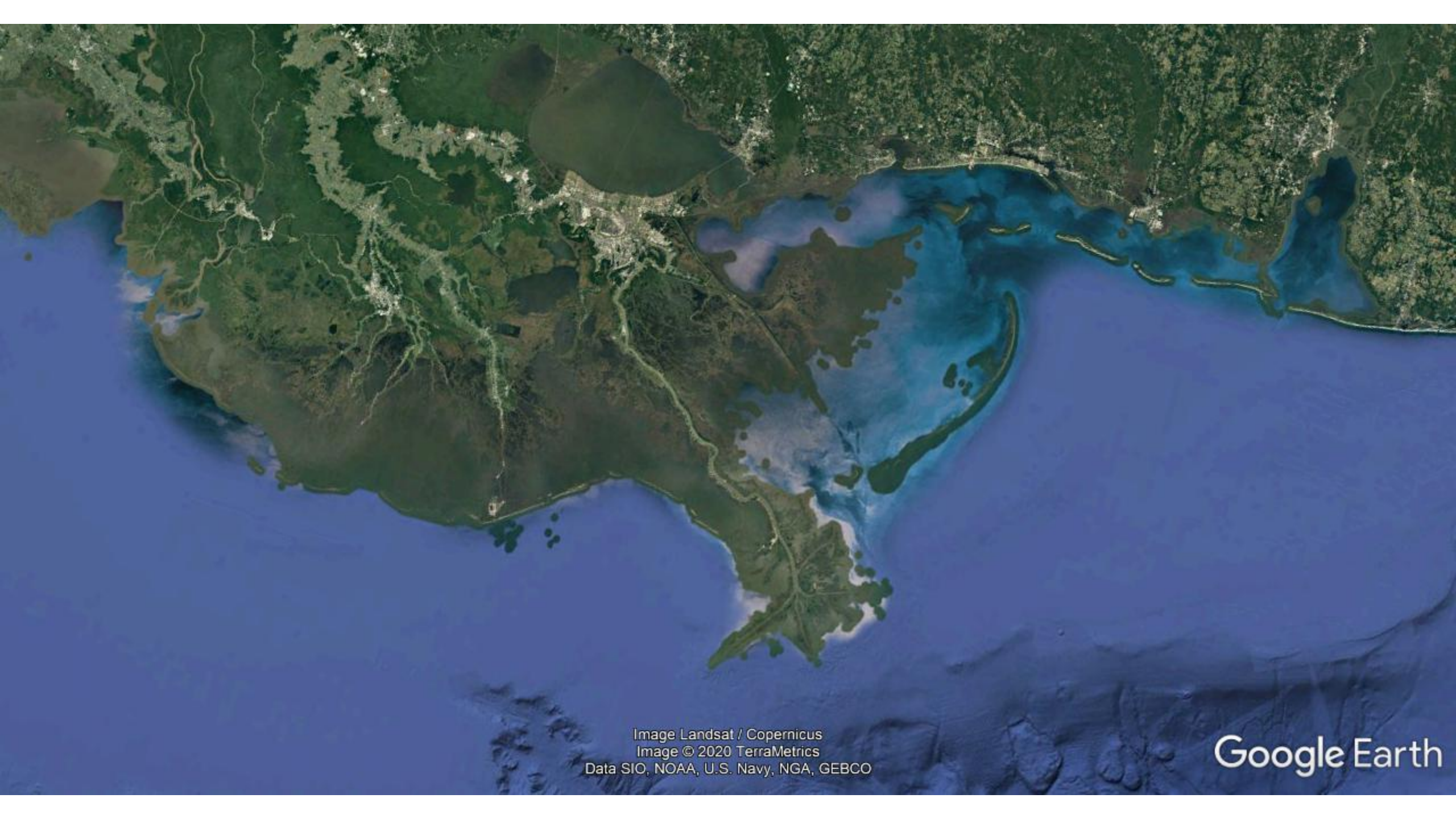


Image Landsat / Copernicus
Image © 2020 TerraMetrics
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google Earth

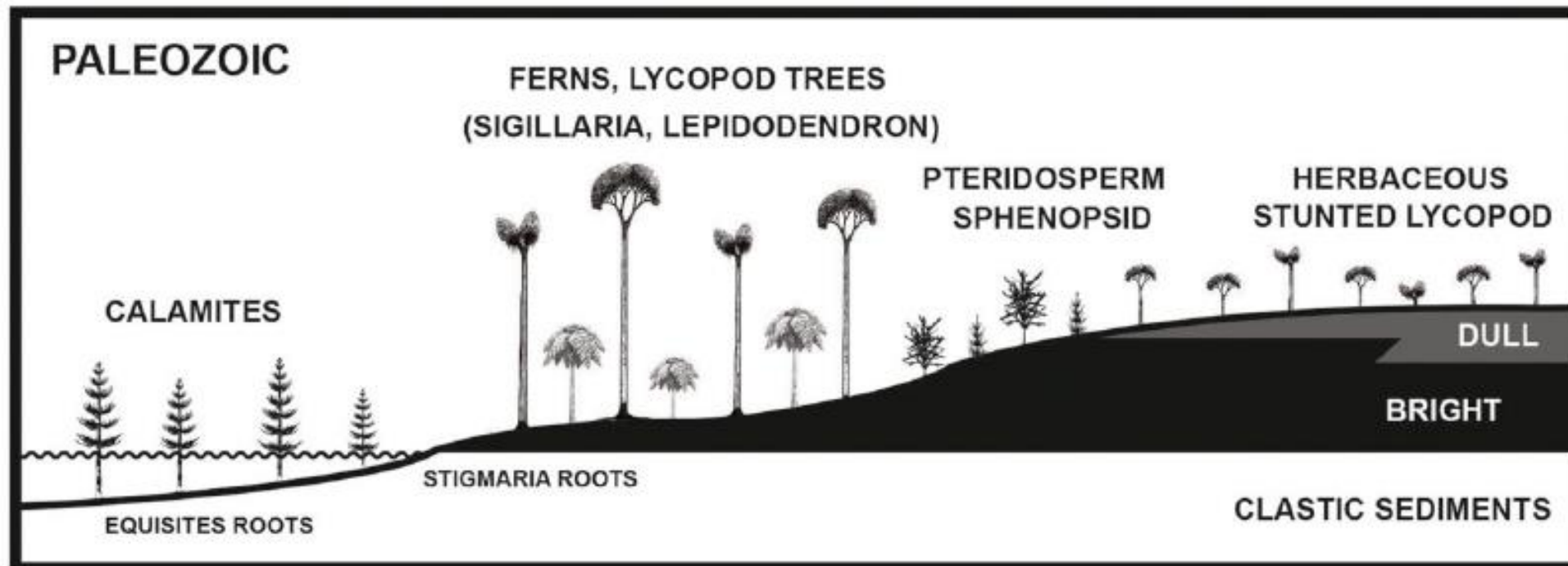
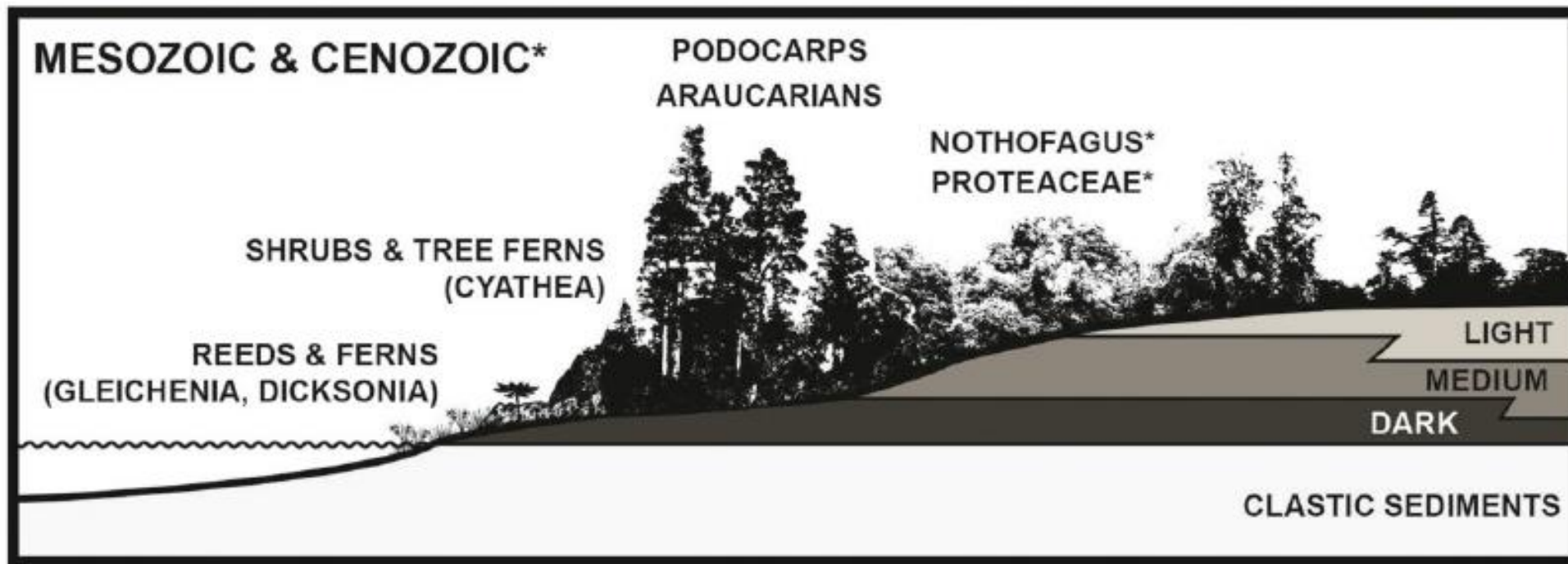


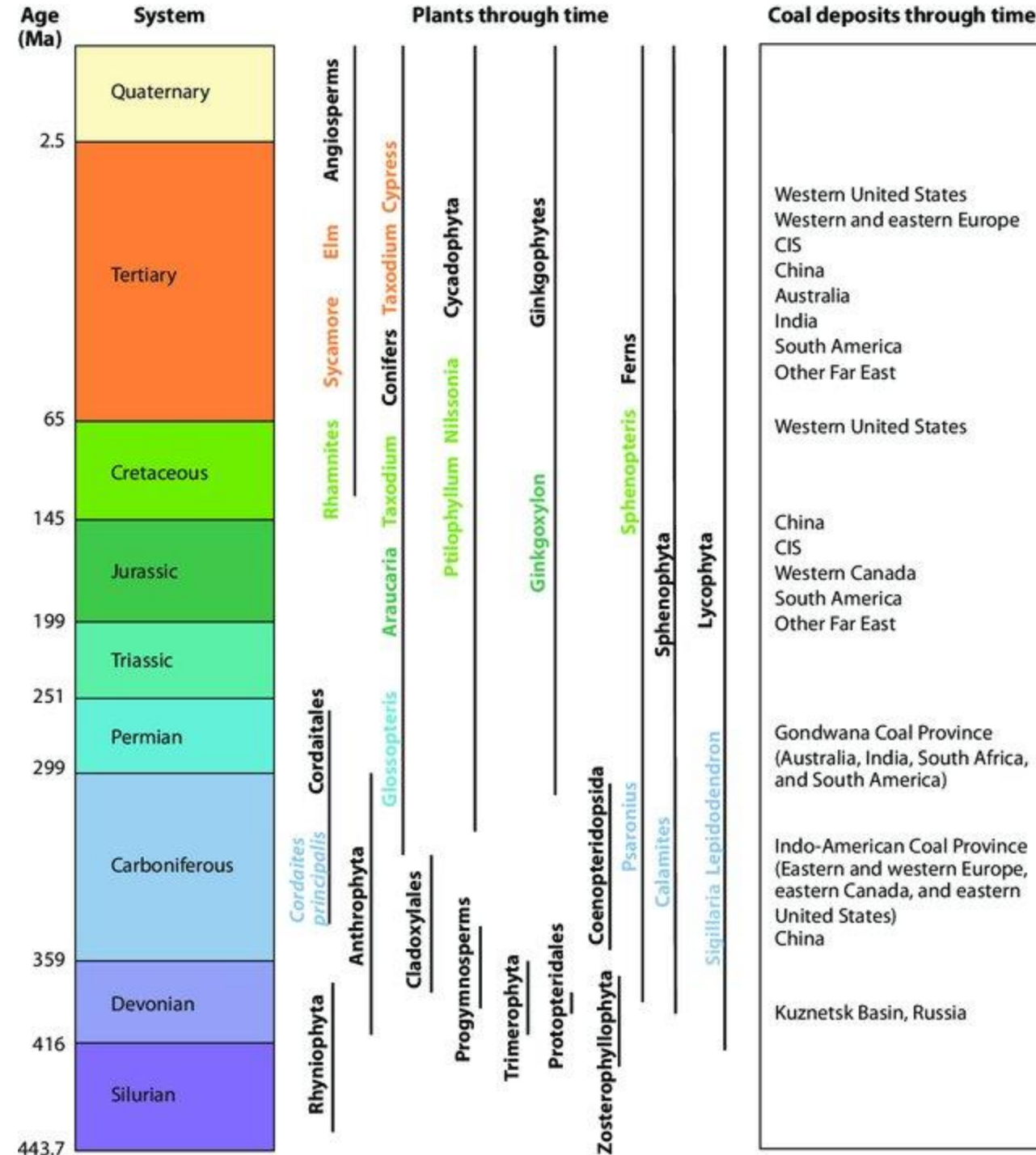


Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google Earth



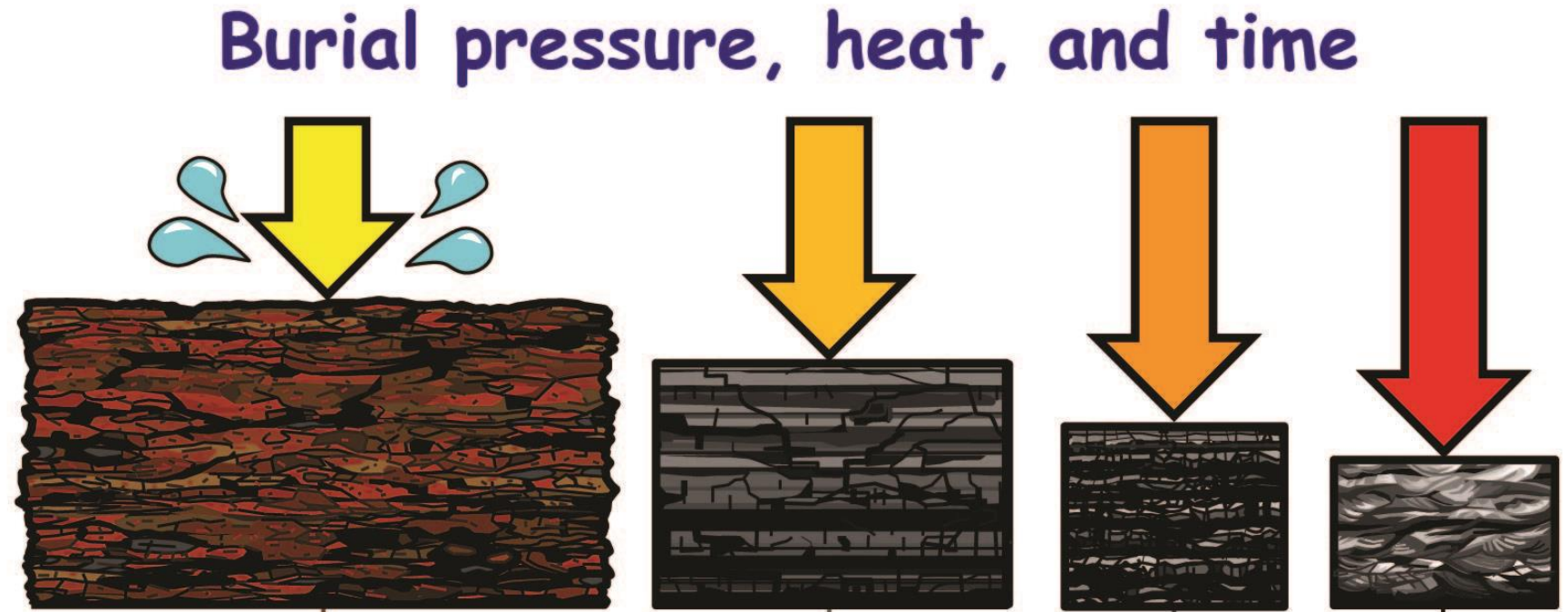




Carbonização (carvonização/coalification)



Peat



Lignite

Sub-bituminous

Bituminous

Anthracite



Linhito



Carvão betuminoso



Antracito



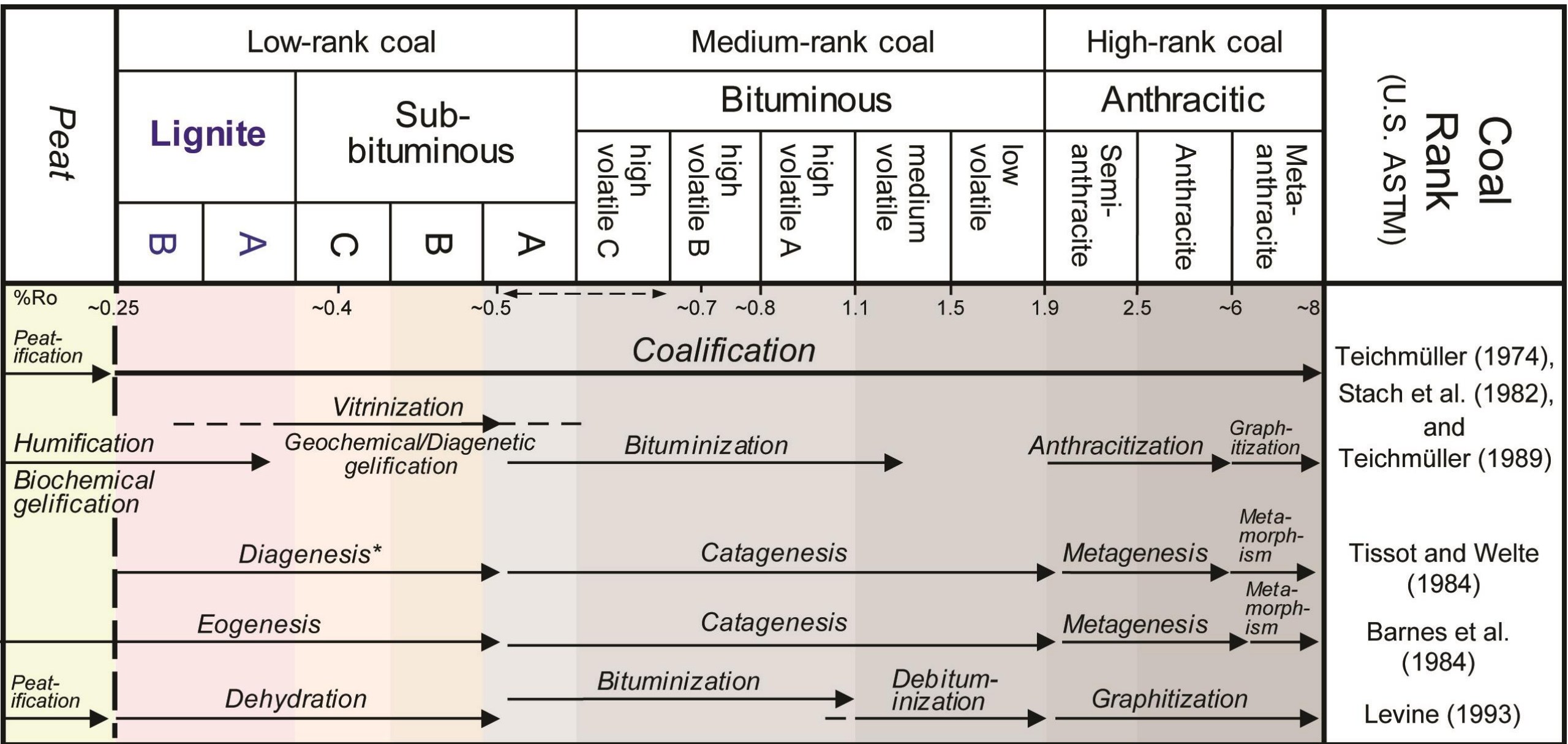
Tipo

Coal type	Lithotype	Appearance
Humic (banded)	Vitrain	Bright, black, shiny and brittle bands, usually with cracks or fissures. Tends to break into small cubes.
	Clarain	Semi-bright (between vitrain and clarain), black, and finely interlayered bands (mm-scale) of vitrain, durain, and sometimes fusain.
	Durain	Dull, black to gray-black bands which have rough surface. Bands have less cracks (fissures) than vitrain. Tends to break into lumps.
	Fusain	Black to gray bands with silky lustre (shine). Sometimes fibrous. Soft and friable, sometimes like charcoal.
Sapropelic (non-banded)	Cannel	Black to dark gray, non-banded coal with dull to greasy lustre (shine). Often breaks with conchoidal (glass-like) fracture.
	Boghead	Similar to cannel but brownish color.

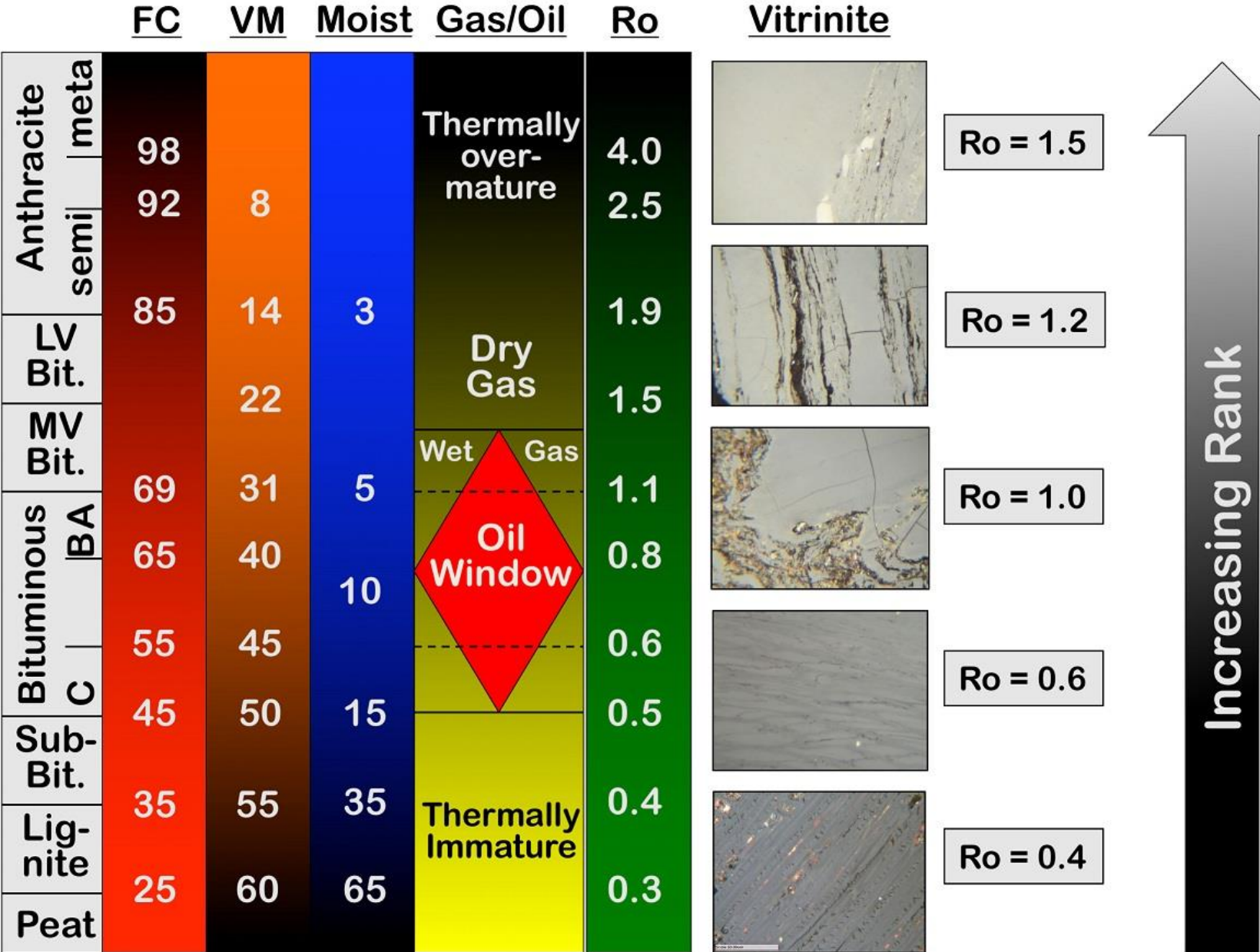
Rank

<i>Peat</i>	Low-rank coal			Medium-rank coal					High-rank coal			Method for determining rank (dmmf) (U.S. ASTM)
	Lignite		Sub-bituminous	Bituminous					Anthracitic			
				high volatile C	high volatile B	high volatile A	medium volatile	low volatile	Semi-anthracite	Anthracite	Meta-anthracite	
	B	A	C	B	A	11,500	13,000	14,000	Less distinct for changing rank			Calorific value (Btu/lb.)
	6,300	8,300	9,500	10,500								
			Less distinct for changing rank						31	22	14	~0
			Less distinct for changing rank						69	78	86	~100

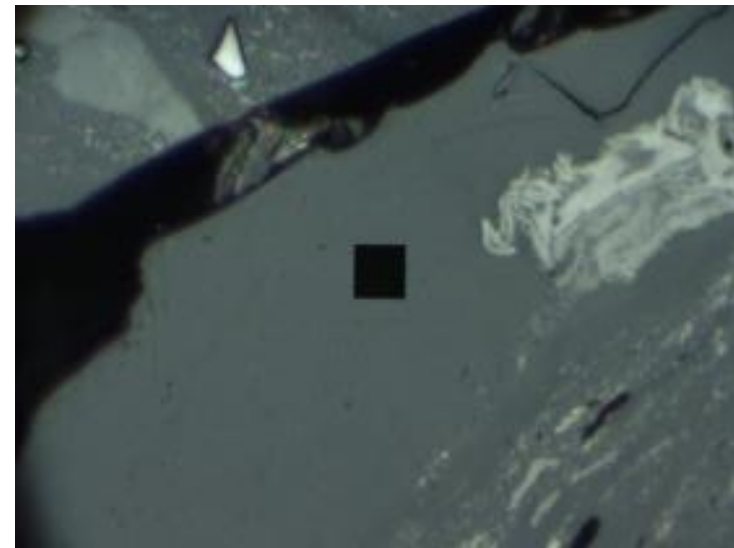
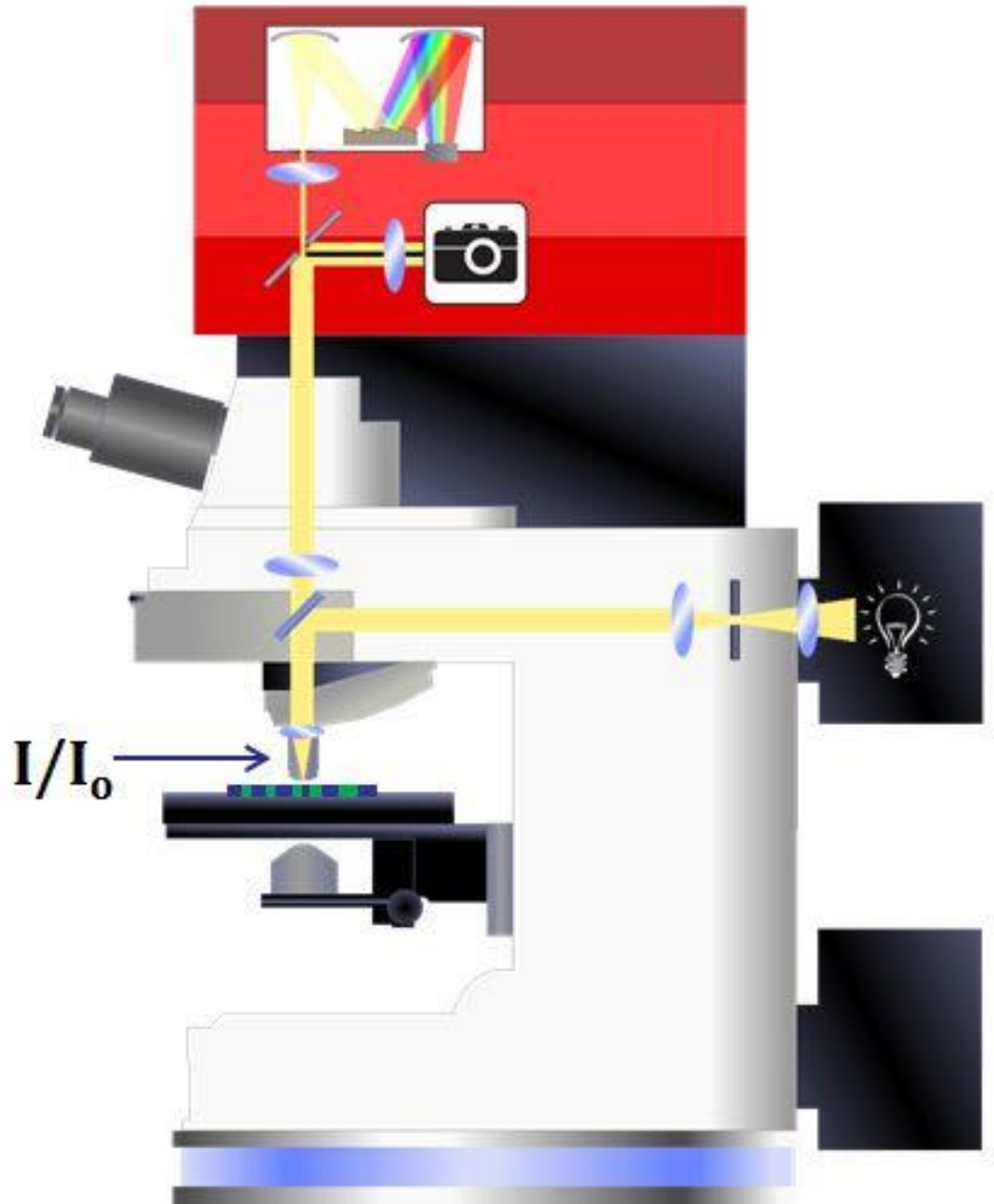
Processos diagenéticos vs Rank



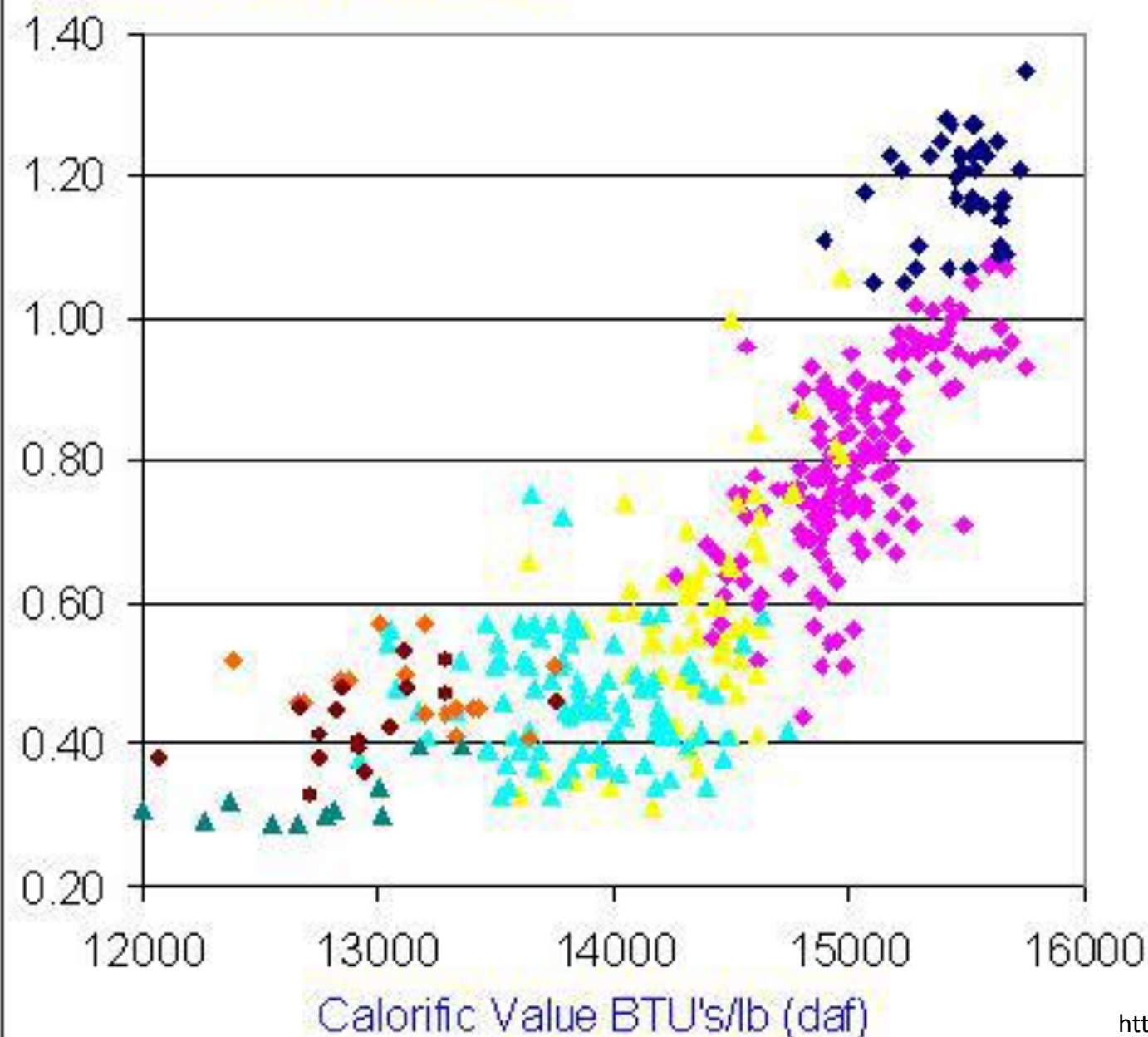
Reflectância de vitrinita



FC = Carbono fixado
VM = Matéria volátil
Moist = Umidade
Ro = reflectância de vitrinita



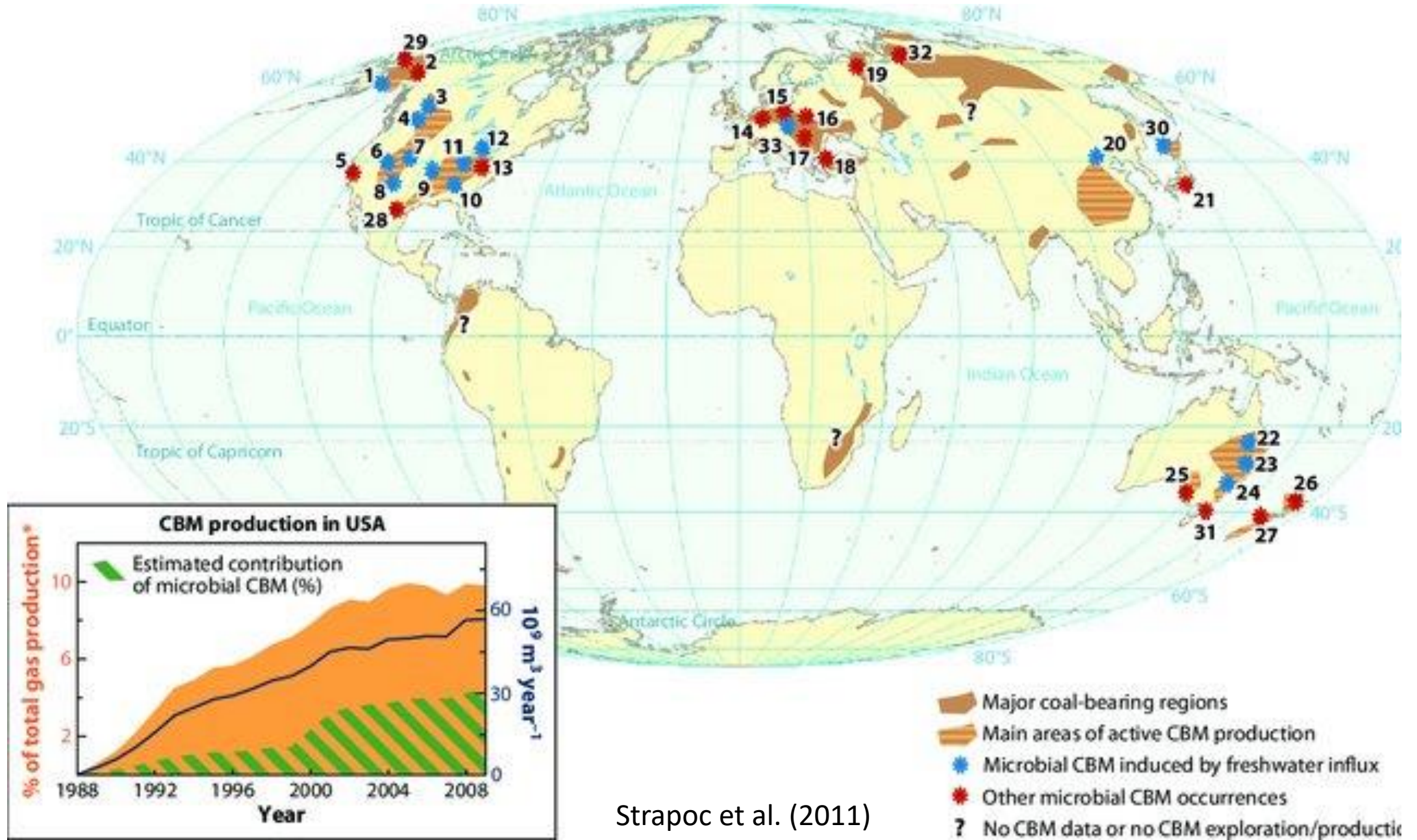
Random Vitrinite Reflectance



Relationship
between Calorific
Value, Vitrinite
Reflectance, &
ASTM Rank
Categories

- ◆ mvb
- ◆ hvAb
- ◆ hvBb
- ◆ hvCb
- ◆ subA
- ◆ subB
- ◆ subC

Coalbed methane (CBM)



Strapoc et al. (2011)

<https://www.uky.edu/KGS/coal/index.php>

<https://energy.usgs.gov/PhotoAtlas/default.aspx?aid=14>