

## DESCRIPTIVE MODEL OF WARM-CURRENT TYPE PHOSPHATE DEPOSITS

By Dan L. Mosier

DESCRIPTION Phosphorites formed in warm currents along the eastern coasts of continents; consist of phosphatic limestone or sandstone.

GENERAL REFERENCES Cathcart and Gulbrandsen (1973), Sheldon (1964).

### GEOLOGICAL ENVIRONMENT

Rock Types Phosphatic limestone and sandstone; chert and diatomaceous material may be present.

Age Range Early Cretaceous through Pliocene.

Depositional Environment Basins of structural lows on the flanks of rising domes, at the mouths of rivers and estuaries. Deposition occurs in warm latitudes) mostly between the 40th parallels. Deposits are formed by dynamic upwelling or by the cool countercurrent associated with warm density current.

Tectonic Setting(s) Continental shelf; may be associated with eugeosynclinal rocks.

### DEPOSIT DESCRIPTION

Mineralogy Fluorapatite + quartz + dolomite + montmorillonite + kaolinite + calcite ± wavellite ± crandallite ± illite ± clinoptilolite ± palygorskite ± smectite ± cellophane.

Texture/Structure Phosphatic pellets and fossil fragments with a carbonate matrix.

Ore Controls Stratigraphic phosphatic horizons within embayments and estuarine environments in proximity to the open sea. Basins on flanks of structural highs (domes, arches, anticlines) are important controls for phosphate deposition.

Weathering Goethite.

Geochemical Signature P, C, U, N, F. Anomalously radioactive.

### EXAMPLES

Paulista, BRZL		(British Sulphur Corp. Ltd. 1980)
East, north, and south Florida, USFL		
Offshore Savannah, USGA		(Zellars-Williams Inc., 1978)

## GRADE AND TONNAGE MODEL OF WARM-CURRENT TYPE PHOSPHATE DEPOSITS

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DATA REFERENCE Krauss and others, (1984).

COMMENTS About half of the deposits are actually districts. Grades have been adjusted to reflect in-place grades rather than commonly reported concentrate grades. See figs. 180-181.

### DEPOSITS

<u>Name</u>	<u>Country</u>	<u>Name</u>	<u>Country</u>
Big Four	USFL	Haynsworth	USFL
Bonny Lake	USFL	Kingsford	USFL
Clear Springs	USFL	Lonesome	USFL
East Florida	USFL	Noralyn-Phosphoria	USFL
Fort Green	USFL	North Florida	USFL
Hard Rock	USFL	North Carolina	USNC

Northeast Florida  
 Offshore Savannah  
 Paulista

USFL  
 USGA  
 BRZL

Rockland  
 Savannah River  
 South Florida

USFL  
 USGA  
 USFL

PHOSPHATE, WARM-CURRENT TYPE

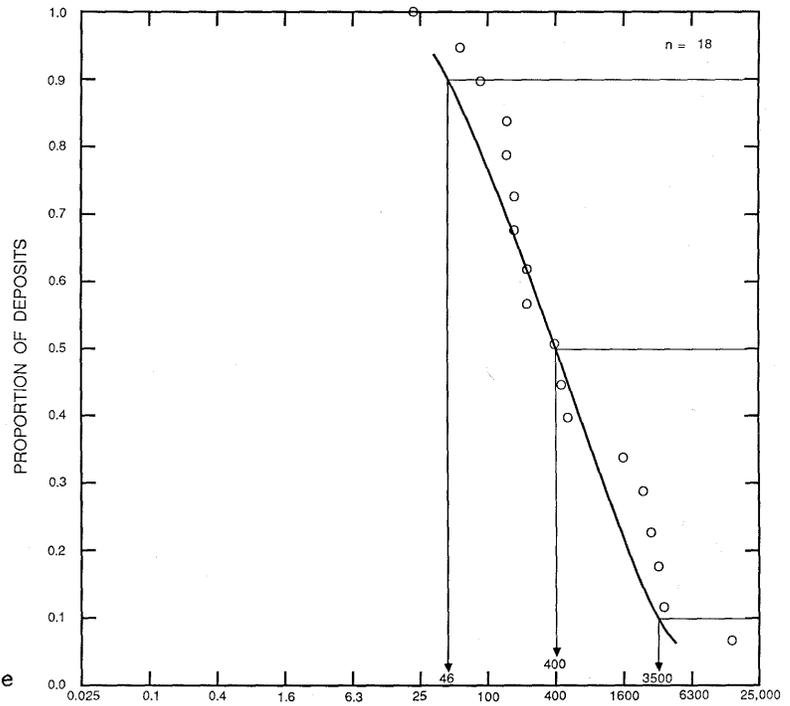


Figure 180. Tonnages of warm-current type phosphate deposits.

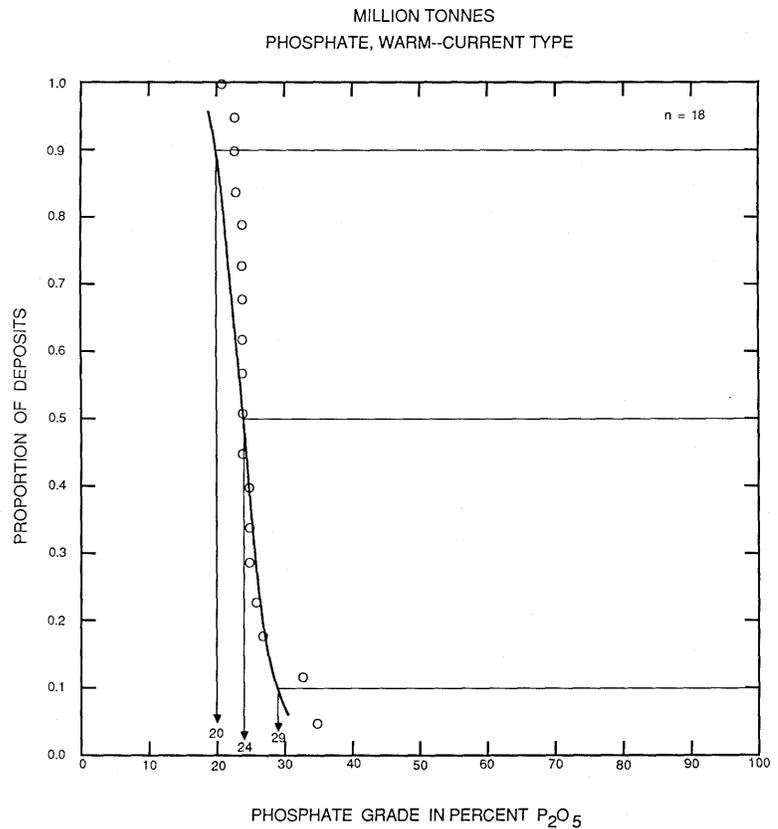


Figure 181. P<sub>2</sub>O<sub>5</sub> grades of warm-current type phosphate deposits.