

Geology 324 – Sedimentology and Stratigraphy Graphic Correlation

In the mid-1960's, Alan B. Shaw (a petroleum geologist) devised a graphic system of biostratigraphic correlation. The procedure is described as follows: using one section of fossiliferous rocks as a standard, carefully record the measured level of the first appearance and the last appearance for each species of fossil throughout the section. Similar data are recorded for all species in common at another stratigraphic section. Data from the standard section are plotted on the X-axis, and corresponding data from the second section are recorded on the Y-axis. Use one symbol for first appearances, and a different symbol for last appearances. For additional information, refer to the section in your text entitled "Quantitative Biostratigraphy" (p. 352). The points will cluster along a line, called a line of correlation (a "best-fit" line to the data, there are a variety of statistical metrics for calculating a "best fit" curve, and graphing programs include them). Once this line has been established, it is possible to correlate precise points from one section to the other. By accumulating data in the standard section as additional local sections are correlated, a composite standard is generated that has great power in correlating new sections as they are studied. Three sets of biostratigraphic data are presented below for three standard sections (X) and three comparative sections (Y). Numbers refer to the height, in meters, the first and last appearances of each taxon (labeled Sp.) occur. **Your results should be neatly presented, with the answers to the discussion questions typed on a separate sheet.**

Sp.	Set 1				Sp.	Set 2				Sp.	Set 3			
	Start		End			Start		End			Start		End	
	X	Y	X	Y		X	Y	X	Y		X	Y	X	Y
A	15	5	49	23	A	14	20	42	50	A	5	14	68	71
B	21	14	94	53	B	6	6	47	50	B	4	5	40	50
C	27	12	99	58	C	21	25	36	47	C				
D	16	10	80	47	D	15	13	80	50	D	15	24	50	58
E	32	18	83	54	E	22	33	85	58	E	25	34	46	53
F	42	28	91	63	F	32	31	90	54	F	26	38	77	73
G	54	24	68	38	G	7	14	75	50	G	33	47	56	59
H	53	34	79	58	H	25	26	82	53	H	32	42	70	68
I	57	32	86	51	I	70	50	90	63	I	37	50	58	64
J	69	34	85	43	J	36	40	81	52	J	45	55	77	77
K	43	23	81	51	K	40	47	86	53	K				

- Using the data provided in stratigraphic data set 1, plot the first and last appearances for each species A through K using whichever computer graphing program with which you are comfortable. Use the program to generate a "best fit" line to the plotted points.
- What stratigraphic level in section X corresponds to level 85 meters in section Y? Is the sediment accumulation rate the same for both sections? Why or why not? If not, which section shows evidence of net higher accumulation rate?
- Repeat the plotting procedure using data set 2. Explain the horizontal part of your curve.
- Repeat the procedure again using data set 3. Explain the change in slope of the "best fit" line.