DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

**Planktic foraminifer census data from
Site RC-15-62 and
Ocean Drilling Program Holes
747A and 751A**

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INTRODUCTION

The U.S. Geological Survey is conducting a long-term study of the climatic and oceanographic conditions of the Pliocene. One of the major elements of the study involves the use of quantitative composition of planktic foraminifer assemblages in conjunction with stable isotope analysis of planktic and benthic foraminifers to estimate sea-surface temperatures and identify major oceanographic boundaries and water masses. We anticipate analyzing many samples during the project which will result in a large volume of raw census data. In addition, it is likely that all or some of the census data from individual cores will be incorporated into analyses for more than one report over the course of the project. Therefore we have decided to make the raw census data available in a series of open-file reports that will provide basic data for future work. In this report we present counting categories and raw census data for planktic foraminifer assemblages in 60 samples from RC-15-62 and ODP Holes 747A and 751A (Fig. 1).

FIGURE 1. Location of Sites
RC-15-62, 747A and 751A.

A variety of statistical techniques are being developed to transform census data of foraminifers in Pliocene deep-sea cores into quantitative estimates of Pliocene sea-surface temperatures. Details of statistical techniques, details of taxonomic groupings, and oceanographic interpretations are presented in more formal publications (Dowsett and Poore, 1990, 1991; Dowsett, 1991).

Latitude, longitude, and water depth in meters for each locality are shown in Table 1. Counts of variables tabulated in each sample are given in Tables 2-4.

TABLE 1. Localities discussed in text

Site	Lat.	Lon.	Water Depth
RC-15-62	-45.29	-77.21	2809.0
747A	-54.81	76.79	1695.0
751A	-57.72	79.81	1633.8

Negative latitude is South latitude; negative longitude is West longitude.

METHODS

The samples used in this study were washed using low temperature (isotope) procedures. Sediment samples were dried in an oven at $\leq 50^{\circ}\text{C}$. The dried bulk sample was disaggregated in a beaker with warm tap water and about 2ml of dilute calgon solution (5 gm calgon to 1 liter water). The beaker was agitated on a shaker/hot plate without heating. Samples were then washed through a $63\mu\text{m}$ sieve using a fine spray hose and dried in an oven at $\leq 50^{\circ}\text{C}$.

A split of 300-350 planktic foraminifer specimens was sought from the $\geq 149\mu\text{m}$ size fraction using a Carpc sample splitter. Specimens were identified, sorted, and glued to a standard 60 square micropaleontological slide.

COUNTING CATEGORIES

Taxa included in counting categories and used for headings of Tables 2-4 are summarized below. In general, our taxonomic concepts follow Parker (1962; 1967), and Blow (1969). Exceptions to their practices are noted below.

The interval column in Table 2 displays sample depth in centimeters below sea floor. ODP sample designations are

abbreviated in Tables 3 and 4 as core-section, depth within section in centimeters, eg. 10-5, 34 = core 10, section 5, 34 cm below top of section 5. The depth column lists depth of sample below sea floor in meters.

Taxon (taxa) comments

Candeina nitida

Globigerina bulloides (d'Orbigny) including *G. praebulloides* Blow

Globigerina falconensis Blow

Globigerina incisa (Bronnimann and Resig)

Globigerina nepenthes Todd

Globigerinita glutinata (Egger) s.l.

Globigerinoides obliquus Bolli including *G. extremus* Bolli and Bermudez

Globigerinoides sacculifer (Brady) including *G. quadrilobatus* (d'Orbigny) and *G. trilobus* (Reuss)

Globorotalia crassaformis (Galloway and Wissler). This category includes *G. ronda* Blow and *G. oceanica* Cushman and Bermudez .

Globorotalia hirsuta (d'Orbigny)

Globorotalia inflata (d'Orbigny) and *G. puncticulata* (Deshayes)

Globorotalia scitula (Brady) s.l. This category includes various members of the *G. scitula* group, for example *G. subscitula* Conato.

Globorotalia tosaensis Takayanagi and Saito

Globorotalia truncatulinoides (d'Orbigny)

Globorotalia

This category includes *Globorotalia* that were not identified to specific level.

Neogloboquadrina acostaensis
(Blow) including *N. continuosa*
(Blow)

Neogloboquadrina dutertrei

Neogloboquadrina pachyderma
(Ehrenberg) left-coiling.
Relatively small, compact
Neogloboquadrina with 4-5
chambers in the ultimate whorl,
kummerform ultimate chamber,
and a slightly to distinct oval
equatorial outline are included
here. Separating small left-coiling
N. atlantica from large left-coiling
N. pachyderma is arbitrary in many
North Atlantic high-latitude sites.

Neogloboquadrina pachyderma
(Ehrenberg) right-coiling.
This category is restricted to
specimens with 4 chambers in the
ultimate whorl. Right-coiling
specimens close to *N. pachyderma*
that have more than 4 chambers in
the ultimate whorl are tabulated as
"dupac".

"dupac"

This category is used for specimens
of right-coiling *Neogloboquadrina*
with more than four chambers in
the ultimate whorl that are
transitional between *N.*
pachyderma and *N. acostaensis* or *N.*
atlantica.

Orbulina universa d'Orbigny

Pulleniatina

Turborotalita quinqueloba
(Natland)

Other

This category includes unidentified
specimens and taxa that are rare
within assemblages from the cores.

Planktic Total

Total number of planktic forams in
the counting split.

Fragments of planktic foraminifers

Benthic foraminifers

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REFERENCES

- Blow, W. H., 1969, Late middle Eocene to Recent planktonic foraminiferal biostratigraphy. In Bronnimann, P. and Renz, H. H., (Eds), Proceedings of First Planktonic Conference: Leiden (E. J. Brill), p. 199-422.
- Dowsett, H. J., 1991, The development of a long-range foraminifer transfer function and application to Late Pleistocene North Atlantic climatic extremes, *Paleoceanography*, v.6, p. 259-273.
- Dowsett, H. J. and R. Z. Poore 1990, A new planktic foraminifer transfer function for estimating Pliocene through Holocene Sea Surface temperatures, *Marine Micropaleontology* v.16, p. 1-23.

Dowsett, H. J. and R. Z. Poore, 1991, Pliocene sea surface temperatures of the North Atlantic Ocean at 3.0 Ma, *Quaternary Science Reviews* v.10, p. 189-204.

Parker, F. L., 1962, Planktonic foraminiferal species in Pacific sediments, *Micropaleontology*, v. 8, p. 219-254.

Parker, F. L., 1967, Late Tertiary biostratigraphy (Planktonic Foraminifera) of tropical Indo-Pacific deep-sea cores: *Bulletins of American Paleontology*, v. 52, p. 115-208.

TABLE 2. RC-15-62 foraminifer census data

CORE	INTRV	<i>Candeina nitida</i>	<i>Globigerina bulloides</i>	<i>Globigerina falconensis</i>	<i>Globigerina incisa</i>	<i>Globigerina nepenthes</i>	<i>Globigerinita glutinata</i>	<i>Globigerinoides obliquus</i>	<i>Globigerinoides sacculifer</i>	<i>Globorotalia crassaformis</i>	<i>Globorotalia hirsuta</i>	<i>Globorotalia inflata</i>	<i>Globorotalia scitula</i>	<i>Globorotalia tosaensis</i>	<i>Globorotalia</i>	<i>Globorotalia truncatulinoides</i>	<i>Neoglobobulimina acostaensis</i>	<i>Neoglobobulimina dutertrei</i>	<i>Neoglobobulimina pachyderma (d)</i>	<i>Neoglobobulimina pachyderma (s)</i>	*dupac*	<i>Orbulina universa</i>	<i>Pulleniatina</i>	<i>Turborotalia quinqueloba</i>	Other	Fragments	Benthic Forams	Planktic Total
RC-15-62	10	0	125	0	0	1	24	0	0	0	0	37	0	16	1	0	16	3	8	91	3	0	0	14	4	91	16	343
RC-15-62	15	1	127	0	15	1	21	0	0	14	0	18	1	0	1	1	9	7	3	57	16	0	0	94	2	0	24	388
RC-15-62	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RC-15-62	25	0	151	0	17	0	18	0	0	0	0	23	2	27	1	0	9	2	5	47	10	0	0	28	2	271	54	342
RC-15-62	30	0	140	0	9	1	14	0	0	0	0	3	2	29	1	0	10	5	7	64	16	0	0	25	0	0	31	326
RC-15-62	35	0	142	0	19	0	21	0	0	2	0	9	0	26	3	1	8	6	1	43	13	0	0	21	0	118	33	315
RC-15-62	40	0	86	0	3	0	4	0	0	11	0	0	0	4	0	0	1	0	5	31	6	1	0	5	0	116	71	157
RC-15-62	45	0	45	0	6	0	18	0	0	5	0	1	0	14	2	0	0	0	8	25	8	0	0	0	0	0	56	132
RC-15-62	50	0	36	0	5	0	3	0	0	2	0	8	2	6	0	0	1	4	3	14	5	0	0	3	0	81	34	92
RC-15-62	75	0	129	0	5	0	12	0	0	2	0	3	0	25	3	1	5	4	6	65	3	0	0	11	4	0	71	278
RC-15-62	100	0	11	0	2	0	0	0	0	0	0	5	0	6	0	0	0	0	0	0	0	0	0	0	0	17	9	24
RC-15-62	200	0	0	0	1	0	0	4	0	0	0	2	0	1	0	0	1	0	2	1	4	0	0	0	0	28	26	16
RC-15-62	300	0	104	0	5	0	13	0	0	0	1	56	0	5	0	4	38	7	21	32	48	0	0	11	2	13	0	347
RC-15-62	400	0	88	0	11	0	25	0	0	0	0	77	1	17	0	4	15	7	6	91	6	0	0	13	0	0	38	361
RC-15-62	500	0	130	0	11	0	16	0	0	0	0	43	1	10	0	9	9	5	21	51	35	1	0	4	2	320	13	348
RC-15-62	600	0	112	3	6	0	11	0	0	0	0	28	0	1	0	4	4	0	2	121	5	0	3	12	6	0	21	318
RC-15-62	700	0	5	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	14
RC-15-62	760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RC-15-62	769	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RC-15-62	775	0	18	0	5	0	2	0	0	0	0	49	0	3	0	1	8	0	6	0	15	0	0	0	0	0	94	107
RC-15-62	780	0	26	0	7	0	1	0	0	0	1	22	0	3	0	1	1	0	1	2	2	0	0	0	1	178	26	68
RC-15-62	800	0	58	0	2	0	5	0	0	0	0	110	0	3	0	12	23	7	24	31	63	1	0	22	0	0	33	361
RC-15-62	900	0	94	0	17	0	4	0	0	0	0	102	0	1	0	0	2	4	12	18	53	2	0	2	2	0	146	313
RC-15-62	1000	0	106	0	3	0	15	0	0	0	0	49	1	0	0	0	6	5	6	89	13	2	0	6	2	0	44	303
RC-15-62	1050	0	48	0	9	0	8	0	0	0	0	233	1	0	0	0	0	0	14	5	12	0	0	0	1	0	477	331
RC-15-62	1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RC-15-62	1125	0	63	0	11	0	9	0	0	2	0	104	0	4	0	0	4	3	7	106	18	2	1	3	1	150	13	338
RC-15-62	1150	0	55	0	10	0	10	0	0	0	0	49	0	0	0	0	2	0	4	156	5	0	0	3	3	122	7	297
RC-15-62	1175	0	43	0	9	0	11	0	0	2	0	43	1	1	0	0	0	9	3	190	6	0	0	0	0	104	6	318
RC-15-62	1200	0	53	0	10	0	8	0	0	6	0	21	1	0	0	0	0	33	4	161	12	0	0	3	1	113	13	313
RC-15-62	1225	0	81	0	9	0	5	0	0	17	0	51	2	0	0	0	2	12	3	95	12	0	0	0	1	76	19	290
RC-15-62	1250	0	87	0	9	0	8	0	0	0	0	75	3	0	0	0	1	34	4	114	7	0	0	0	1	135	14	343
RC-15-62	1260	0	85	0	10	0	12	0	0	0	0	73	2	0	0	0	0	11	4	133	8	0	0	3	0	152	40	341
RC-15-62	1270	0	80	0	13	0	14	0	0	10	0	82	2	0	0	0	0	8	2	94	8	0	0	0	0	219	31	313
RC-15-62	1280	0	105	0	15	0	16	0	0	15	0	78	3	0	0	0	2	7	7	113	14	0	0	3	2	220	57	380
RC-15-62	1290	0	77	0	8	0	18	0	0	0	0	91	0	0	0	0	2	10	2	154	8	0	0	0	0	150	38	370
RC-15-62	1300	0	64	0	9	0	9	0	0	0	0	53	1	0	0	0	0	11	6	121	20	0	0	2	0	0	35	296
RC-15-62	1310	0	72	2	12	0	15	0	1	0	0	49	2	0	0	0	0	9	5	134	37	0	0	2	0	230	42	340
RC-15-62	1320	0	79	0	12	0	17	0	0	13	0	89	2	0	0	0	3	4	10	64	48	0	0	0	0	287	30	341
RC-15-62	1330	0	20	24	12	0	0	0	0	0	0	38	0	2	0	0	0	5	180	23	5	0	0	0	0	183	17	309
RC-15-62	1340	0	74	0	7	0	8	0	0	5	0	72	0	0	0	0	17	0	32	24	105	0	0	2	2	230	24	348
RC-15-62	1350	0	50	0	7	0	3	0	0	5	0	118	0	7	0	2	34	0	29	36	43	1	0	0	4	194	35	339
RC-15-62	1360	0	68	2	6	0	6	0	0	10	1	101	1	0	5	0	39	0	9	48	11	1	0	2	1	0	29	311
RC-15-62	1370	0	46	0	5	0	8	0	0	11	1	134	0	0	0	0	15	0	9	55	14	0	0	1	2	187	46	301

TABLE 3. ODP Hole 747A planktic foraminifer census data

SAMPLE	DEPTH	<i>Globigerina bulloides</i>	<i>Globigerinita glutinata</i>	<i>Globorotalia</i>	<i>Neoglobobuadrina pachyderma</i> (d)	<i>Neoglobobuadrina pachyderma</i> (s)	"dupac"	Other	Fragments	Benthic Forams	Planktic Total
3H - 1 , 69	19.11	2	0	0	3	341	2	1	30	1	349
3H - 1 , 100	19.50	6	1	0	0	313	0	0	40	0	320
3H - 1 , 132	19.82	5	0	0	5	317	0	1	40	0	328
3H - 2 , 18	20.18	3	0	0	3	296	0	0	>300	4	302
3H - 2 , 50	20.50	3	0	0	1	335	0	1	>100		340
3H - 2 , 80	20.80	11	1	4	1	295	1	0	>100	2	313
3H - 2 , 105	21.05	28	7	13	1	272	0	2	50	3	323
3H - 2 , 140	21.40	49	6	2	3	271	0	4	>150	2	335
3H - 3 , 17	21.67	17	4	0	1	267	0	10	>150	0	299
3H - 3 , 50	22.00	21	0	0	3	276	1	9	>100	0	310

TABLE 4. ODP Hole 751A planktic foraminifer census data

SAMPLE	DEPTH	<i>Globigerina bulloides</i>	<i>Globigerinita glutinata</i>	<i>Neoglobobuadrina pachyderma</i> (d)	<i>Neoglobobuadrina pachyderma</i> (s)	"dupac"	Other	Fragments	Benthic Forams	Planktic Total
2H - 2 , 137	7.57	16	0	5	299	0	3	20	29	323
2H - 3 , 16	7.86	8	0	1	272	0	7	16	26	288
2H - 3 , 20	7.90	3	0	1	145	2	0	6	17	151
2H - 3 , 43	8.13	10	0	2	318	0	0	5	6	330
2H - 3 , 60	8.30	7	0	4	300	0	1	11	17	312
2H - 3 , 81	8.51	3	1	6	291	0	4	24	19	305