

SUPPLEMENTARY METHODS

Dated horizons in the Madeira Abyssal Plain sequence are provided by detailed coccolith biostratigraphy and oxygen isotope stratigraphies (Weaver and Kuijpers, 1983; Howe and Sblendorio-Levy, 1998; Wynn et al., 2002). Dating of Balearic Abyssal Plain cores is based on nanofossil biostratigraphy, radiocarbon dating (Rothwell et al., 1998), and correlation of continuous downcore elemental data (calcium and strontium data using the ITRAX micro-XRF core scanner) with high resolution oxygen isotope and calcium carbonate stratigraphy available for other cores in the southern part of the basin (Hoogakker et al., 2004). Dating of the Marnoso-arenacea Formation is provided by two biostratigraphic (nanofossil) horizons at 13.5 and 14.1 Ma that bound the studied interval.

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TABLE DR1: SUMMARY OF DATASETS ANALYZED

Basin (Area)	Data Source (Age)	Input sources	Interval Selection	Criteria for discerning hemipelagic mud	Number of turbidites (N)	Mean Inter-event time, λ (years)
Balearic Abyssal Plain (60,000 km ²)	Calypso Piston Cores LC04 & LC05: Holocene to Late Pleistocene (0 to 0.15 Ma)	Multiple (6-7) potential sources – Rhone, Ebro, Var, Valencia Fan, Algerian Margin, Balearics, Corsica/Sardinia	Entirety of sampled interval	Foraminifer-rich (core surface appears pitted), colour difference, massive, non-laminated (Hoogakker et al., 2004)	151 [*] / 111 [†]	1000 [*] / 1,400 [†]
Madeira Abyssal Plain (68,000 km ²)	ODP Boreholes 950, 951, 952: Holocene to late Miocene (0 to 7 Ma)	Two main sources –Canary Islands (predominantly volcanoclastic) and Agadir Canyon/Basin (siliciclastic and calcareous)	Post-7 Ma interval in which beds can be reliably correlated between cores	Foraminifer-rich, distinct colour difference, massive, non-laminated (Wynn et al., 2002)	108	36,500
Marnoso-Arenacea, Italian Apennines (>3,600 km ²)	Outcrop: Mid Miocene (13.5 to 14.1 Ma)	Two sources – Dominant Alpine-Apennine source, plus occasional source for calcareous flows	Interval between dated horizons	Foraminifer-rich, distinct colour difference, massive, non-laminated (Talling et al., 2007a,b, 2012a)	696	1,400

Note: Where no intervening hemipelagic mud occurs between turbidites in the Balearic Abyssal Plain data, two recurrence intervals are presented:

*Assuming stacked turbidites represent run-out from discrete but contemporaneous slides.

†Assuming stacked turbidites represent multiple pulses of run-out from the same slide (e.g. multi-stage failure).

TABLE DR2: COORDINATES FOR STUDY AREAS AND MINIMUM RESOLVABLE TIME INTERVALS

Study Area	Latitude	Longitude	Minimum resolvable thickness	Minimum Sediment Accumulation Rate	Minimum resolvable interval
Balearic Abyssal Plain – Core LC05	38.0255	5.50972	5 mm	25 mm/ka	0.2 ka
Madeira Abyssal Plain	31.1503	-25.6011	10 mm	2 mm/ka	5.0 ka
Marnoso-Arenacea, Italian Apennines	43.9422	11.9068	50 mm	153 mm/ka	0.3 ka

Note: Sedimentation rates, and hence the time series, are assumed to be stationary in intervals available dated horizons. The greatest uncertainty resides in the Marnoso-arenacea data as only two dated points exist.

TABLE DR3: BALEARIC ABYSSAL PLAIN DATA.

Turbidite bed volumes are presented for two cases: ponding over the entire basin plain (60,000 km² based on Rothwell et al., 1998); and based on an assumption that deposition is over 50% of the basin plain. Most flows are interpreted to have been sourced from the north; hence they would have travelled ~350 km to reach LC05 and are likely to have ponded. BSF = Below seafloor.

Depth to Base of Bed [m BSF]	Bed No	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³] - Assumes ponding over 60,000 km ²	Estimated Volume [km ³] - Assumes ponding over 30,000 km ²
0.200	151	0.15	0.047	0.047	9.00	4.50
0.451	150	0.301	0.047	<0.001	18.06	9.03
1.080	149	0.62	4.094	4.048	37.20	18.60
2.100	148	0.94	8.979	4.885	56.40	28.20
2.540	147	0.4	10.329	1.349	24.00	12.00
3.220	146	0.38	14.480	4.151	22.80	11.40
3.570	145	0.35	14.480	<0.001	21.00	10.50
3.850	144	0.15	15.496	1.016	9.00	4.50
4.010	143	0.16	15.496	<0.001	9.60	4.80
4.240	142	0.23	15.496	<0.001	13.80	6.90
4.550	141	0.26	16.299	0.802	15.60	7.80
4.945	140	0.295	17.055	0.757	17.70	8.85
5.300	139	0.275	17.936	0.880	16.50	8.25
5.405	138	0.105	17.936	<0.001	6.30	3.15
5.630	137	0.17	18.292	0.357	10.20	5.10
5.950	136	0.225	18.678	0.385	13.50	6.75
6.351	135	0.301	19.337	0.660	18.06	9.03
11.550	134	5.199	19.337	<0.001	311.94 <i>500 km³ calculated by Rothwell et al. (1998)</i>	155.97
11.610	133	0.06	19.337	<0.001	3.60	1.80
11.780	132	0.165	19.482	0.144	9.90	4.95
12.320	131	0.54	19.482	<0.001	32.40	16.20
12.650	130	0.07	21.015	1.534	4.20	2.10
13.050	129	0.35	21.602	0.586	21.00	10.50
13.230	128	0.17	21.683	0.081	10.20	5.10
13.320	127	0.09	21.683	<0.001	5.40	2.70
13.380	126	0.06	21.683	<0.001	3.60	1.80
13.775	125	0.325	22.008	0.325	19.50	9.75
14.040	124	0.265	22.008	<0.001	15.90	7.95
14.150	123	0.08	22.387	0.379	4.80	2.40
14.310	122	0.095	22.991	0.604	5.70	2.85
14.530	121	0.095	24.178	1.187	5.70	2.85
14.570	120	0.04	24.178	<0.001	2.40	1.20
14.850	119	0.275	24.201	0.023	16.50	8.25
15.075	118	0.075	25.042	0.841	4.50	2.25

Depth to Base of Bed [m BSF]	Bed No	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³] - Assumes ponding over 60,000 km ²	Estimated Volume [km ³] - Assumes ponding over 30,000 km ²
15.230	117	0.14	25.142	0.100	8.40	4.20
15.510	116	0.135	27.583	2.440	8.10	4.05
15.605	115	0.095	27.583	<0.001	5.70	2.85
15.950	114	0.22	31.736	4.154	13.20	6.60
16.210	113	0.235	33.005	1.269	14.10	7.05
16.780	112	0.555	36.582	3.577	33.30	16.65
17.050	111	0.17	40.966	4.384	10.20	5.10
17.145	110	0.065	43.081	2.115	3.90	1.95
17.330	109	0.165	43.389	0.308	9.90	4.95
17.430	108	0.09	43.968	0.579	5.40	2.70
17.700	107	0.2	45.619	1.651	12.00	6.00
17.770	106	0.06	45.744	0.126	3.60	1.80
18.075	105	0.225	46.924	1.179	13.50	6.75
18.250	104	0.175	46.924	<0.001	10.50	5.25
18.435	103	0.135	48.370	1.447	8.10	4.05
18.550	102	0.115	48.370	<0.001	6.90	3.45
18.875	101	0.295	48.685	0.314	17.70	8.85
18.995	100	0.095	48.842	0.157	5.70	2.85
19.250	99	0.22	49.235	0.393	13.20	6.60
19.500	98	0.16	50.467	1.232	9.60	4.80
19.670	97	0.14	50.688	0.221	8.40	4.20
20.055	96	0.34	50.973	0.285	20.40	10.20
20.450	95	0.38	51.828	0.855	22.80	11.40
20.770	94	0.22	53.014	1.186	13.20	6.60
20.935	93	0.105	53.464	0.450	6.30	3.15
21.010	92	0.055	53.630	0.165	3.30	1.65
21.210	91	0.05	55.340	1.710	3.00	1.50
21.375	90	0.075	58.872	3.533	4.50	2.25
21.645	89	0.26	59.031	0.159	15.60	7.80
21.870	88	0.07	59.031	<0.001	4.20	2.10
21.980	87	0.335	60.605	1.574	20.10	10.05
22.170	86	0.22	61.967	1.362	13.20	6.60
22.535	85	0.285	63.489	1.521	17.10	8.55
22.610	84	0.055	63.683	0.195	3.30	1.65
22.900	83	0.2	65.314	1.631	12.00	6.00
22.970	82	0.06	65.672	0.358	3.60	1.80
23.090	81	0.08	67.045	1.373	4.80	2.40
23.130	80	0.04	67.045	<0.001	2.40	1.20
23.300	79	0.11	70.119	3.074	6.60	3.30
23.355	78	0.04	70.448	0.328	2.40	1.20
23.570	77	0.2	70.806	0.358	12.00	6.00

Depth to Base of Bed [m BSF]	Bed No	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³] - Assumes ponding over 60,000 km ²	Estimated Volume [km ³] - Assumes ponding over 30,000 km ²
23.740	76	0.09	73.313	2.507	5.40	2.70
23.980	75	0.21	74.635	1.322	12.60	6.30
24.060	74	0.06	75.577	0.942	3.60	1.80
24.170	73	0.04	76.979	1.401	2.40	1.20
24.475	72	0.06	82.636	5.657	3.60	1.80
25.085	71	0.595	82.813	0.177	35.70	17.85
25.175	70	0.075	83.091	0.278	4.50	2.25
25.345	69	0.155	83.293	0.202	9.30	4.65
25.450	68	0.055	84.936	1.643	3.30	1.65
25.630	67	0.04	88.246	3.310	2.40	1.20
25.800	66	0.095	89.131	0.884	5.70	2.85
25.970	65	0.12	90.293	1.162	7.20	3.60
26.040	64	0.07	90.293	<0.001	4.20	2.10
26.270	63	0.22	90.520	0.227	13.20	6.60
26.300	62	0.03	90.520	<0.001	1.80	0.90
26.650	61	0.25	92.817	2.297	15.00	7.50
26.810	60	0.09	94.297	1.480	5.40	2.70
27.175	59	0.075	100.796	6.498	4.50	2.25
27.350	58	0.1	101.199	0.403	6.00	3.00
27.600	57	0.17	103.164	1.965	10.20	5.10
27.700	56	0.02	104.329	1.164	1.20	0.60
27.830	55	0.12	104.473	0.144	7.20	3.60
27.855	54	0.025	104.473	<0.001	1.50	0.75
27.950	53	0.05	105.223	0.750	3.00	1.50
28.050	52	0.04	106.333	1.111	2.40	1.20
28.180	51	0.08	107.040	0.707	4.80	2.40
28.230	50	0.01	107.718	0.678	0.60	0.30
28.410	49	0.115	108.554	0.837	6.90	3.45
28.520	48	0.075	109.160	0.606	4.50	2.25
28.710	47	0.1	109.795	0.635	6.00	3.00
28.755	46	0.04	109.795	<0.001	2.40	1.20
28.800	45	0.045	109.795	<0.001	2.70	1.35
29.025	44	0.175	110.329	0.534	10.50	5.25
29.050	43	0.025	110.545	0.216	1.50	0.75
29.200	42	0.14	110.545	<0.001	8.40	4.20
29.400	41	0.1	113.504	2.960	6.00	3.00
29.500	40	0.05	115.660	2.155	3.00	1.50
29.805	39	0.115	121.275	5.615	6.90	3.45
29.980	38	0.16	121.567	0.293	9.60	4.80
30.100	37	0.05	123.244	1.676	3.00	1.50
30.150	36	0.05	123.244	<0.001	3.00	1.50

Depth to Base of Bed [m BSF]	Bed No	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³] - Assumes ponding over 60,000 km ²	Estimated Volume [km ³] - Assumes ponding over 30,000 km ²
30.190	35	0.04	123.670	0.426	2.40	1.20
30.350	34	0.13	124.362	0.692	7.80	3.90
30.400	33	0.05	124.362	<0.001	3.00	1.50
30.455	32	0.055	124.362	<0.001	3.30	1.65
30.550	31	0.095	124.362	<0.001	5.70	2.85
30.615	30	0.065	124.362	<0.001	3.90	1.95
30.650	29	0.035	124.362	<0.001	2.10	1.05
30.790	28	0.12	124.601	0.239	7.20	3.60
30.850	27	0.04	125.000	0.399	2.40	1.20
31.050	26	0.16	125.852	0.852	9.60	4.80
31.200	25	0.15	127.236	1.384	9.00	4.50
31.325	24	0.125	127.236	<0.001	7.50	3.75
31.510	23	0.185	127.236	<0.001	11.10	5.55
31.550	22	0.04	127.236	<0.001	2.40	1.20
31.650	21	0.1	127.236	<0.001	6.00	3.00
31.700	20	0.05	127.236	<0.001	3.00	1.50
31.940	19	0.24	127.236	<0.001	14.40	7.20
32.100	18	0.16	127.236	<0.001	9.60	4.80
32.200	17	0.105	127.236	<0.001	6.30	3.15
32.400	16	0.09	128.167	0.931	5.40	2.70
32.610	15	0.185	128.699	0.532	11.10	5.55
33.290	14	0.34	137.454	8.755	20.40	10.20
33.380	13	0.07	137.986	0.532	4.20	2.10
33.620	12	0.24	138.386	0.399	14.40	7.20
33.925	11	0.1	143.974	5.588	6.00	3.00
33.940	10	0.015	143.974	<0.001	0.90	0.45
34.200	9	0.2	143.974	<0.001	12.00	6.00
34.430	8	0.205	144.506	0.532	12.30	6.15
34.700	7	0.09	145.038	0.532	5.40	2.70
35.025	6	0.19	147.965	2.927	11.40	5.70
35.225	5	0.175	148.391	0.426	10.50	5.25
35.310	4	0.085	148.391	<0.001	5.10	2.55
35.610	3	0.25	149.136	0.745	15.00	7.50
35.860	2	0.24	149.136	<0.001	14.40	7.20
36.000	1	0.12	149.216	0.080	7.20	3.60

TABLE DR4: MADEIRA ABYSSAL PLAIN DATA.

Turbidite volumes are calculated based on the methodology outlined in Weaver (2003)

Turbidite ID	Turbidite Type	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³]
B	VOLCANIC	3.11	14.16	0.84	143.47
C	ORGANIC	0.08	14.61	44.00	3.77
D	ORGANIC	1.47	14.61	44.00	67.75
E	ORGANIC	3.51	59.00	110.39	161.66
E1	ORGANIC	0.21	125.00	<0.01	9.76
F	ORGANIC	5.07	125.00	40.00	233.85
G	VOLCANIC DARK	3.14	165.00	55.00	144.57
H	ORGANIC	0.84	220.00	85.00	38.83
J	CALCAREOUS DARK	0.56	305.00	5.00	25.83
K	ORGANIC NON-	0.34	310.00	50.00	15.80
L1	VOLCANIC	0.39	360.00	95.00	17.92
L3	Undefined	0.25	455.00	25.00	11.49
N	VOLCANIC	1.21	480.00	15.00	55.65
O	VOLCANIC	3.11	495.00	10.00	143.51
P	VOLCANIC	2.22	505.00	65.00	102.36
Q	CALCAREOUS	0.99	570.00	31.14	45.66
R	CALCAREOUS	0.71	601.14	22.80	32.80
S	ORGANIC	0.62	623.94	2.54	28.53
S1	ORGANIC	0.38	626.48	2.54	17.33
S2	CALCAREOUS DARK	0.28	629.02	51.29	12.67
T	ORGANIC	1.73	680.31	11.62	79.73
U	ORGANIC	1.41	691.93	2.60	64.76
V	ORGANIC	1.31	694.53	5.20	60.40
V1	CALCAREOUS	0.30	699.73	5.27	13.82
W	ORGANIC NON-	2.78	705.00	2.64	128.05
X	VOLCANIC NON-	0.98	707.64	26.48	45.24
X1	VOLCANIC	0.27	734.13	69.14	12.63
Y	CALCAREOUS	0.72	803.26	26.74	33.10
Z	VOLCANIC PALE	1.06	830.00	150.00	48.90
AA	ORGANIC	1.48	980.00	70.00	68.10
AB	VOLCANIC	3.50	1050.00	49.32	161.33
AC	CALCAREOUS	0.26	1099.32	15.75	11.87
AD	ORGANIC DARK	5.45	1115.07	17.37	251.30
AE	ORGANIC	0.40	1132.44	7.91	18.25
AF	VOLCANIC DARK	0.53	1140.35	21.59	24.38
AG	ORGANIC	2.75	1161.94	75.89	126.68

Turbidite ID	Turbidite Type	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³]
AH	NON-VOLCANIC PALE	2.29	1237.82	35.73	105.31
AI	ORGANIC	1.22	1273.56	16.26	56.23
AI	NON-VOLCANIC	0.18	1289.82	6.52	8.15
AJ	CALCAREOUS	0.34	1296.34	3.26	15.69
AK	NON-VOLCANIC	0.44	1299.60	4.08	20.12
AL	CALCAREOUS	0.20	1303.68	89.97	9.44
AM	CALCAREOUS	0.14	1393.65	27.92	6.30
AN	DARK ORGANIC	0.67	1421.57	3.29	30.99
AO	NON-VOLCANIC	0.74	1424.87	17.32	34.26
AP	CALCAREOUS	0.32	1442.19	8.28	14.62
AQ	ORGANIC	1.02	1450.47	52.81	46.85
AR	NON-VOLCANIC	8.60	1503.28	39.36	305.34
AS	ORGANIC	1.04	1542.64	82.41	37.03
AS1	ORGANIC	0.59	1625.05	30.98	20.87
AS2	CALCAREOUS	0.37	1656.03	77.93	13.28
AT	VOLCANIC	1.56	1733.96	26.04	55.39
AU	VOLCANIC	0.30	1760.00	9.35	10.82
AV	VOLCANIC	0.63	1769.35	67.61	22.20
AW	ORGANIC	5.88	1836.96	72.83	208.55
AY	ORGANIC	1.69	1909.79	1.92	59.91
AZ	NON-VOLCANIC	0.21	1911.71	1.92	7.42
BA	CALCAREOUS	0.97	1913.63	46.37	34.51
BB	VOLCANIC	1.22	1960.00	58.02	43.14
BC	NON-VOLCANIC	0.57	2018.02	97.68	20.31
BD	CALCAREOUS	0.53	2115.71	4.17	18.75
BE	CALCAREOUS	0.50	2119.87	42.12	17.74
BF	VOLCANIC	3.90	2161.99	76.03	138.45
BG	PALE ORGANIC	0.67	2238.02	19.07	23.96
BH	CALCAREOUS	0.86	2257.08	14.86	30.60
BI	DARK ORGANIC	0.56	2271.94	12.74	19.71
BJ	DARK ORGANIC	0.19	2284.68	21.39	6.58
BK	DARK ORGANIC	2.70	2306.07	45.19	95.77
BL	ORGANIC	2.19	2351.27	19.40	77.57
BL1	CALCAREOUS	0.38	2370.66	19.44	13.35
BM	CALCAREOUS	0.66	2390.10	49.90	23.40
BN	VOLCANIC	1.64	2440.00	9.07	58.13
BN1	CALCAREOUS	0.47	2449.07	28.83	16.83

Turbidite ID	Turbidite Type	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³]
BO	PALE ORGANIC	1.31	2477.90	13.68	46.38
BP	ORGANIC	0.62	2491.58	4.57	21.99
BQ	NON-VOLCANIC	0.73	2496.15	25.97	25.99
BR	ORGANIC	1.00	2522.11	4.63	35.67
BS	ORGANIC	4.13	2526.74	30.99	146.50
BT	ORGANIC	1.78	2557.73	3.11	63.14
BU	CALCAREOUS	1.07	2560.84	3.12	38.04
BV	ORGANIC	1.07	2563.96	12.47	38.13
BV1	CALCAREOUS	0.23	2576.43	3.13	8.10
BW	CALCAREOUS	1.00	2579.56	1.57	35.35
BX	ORGANIC	0.72	2581.12	12.57	25.55
BY	ORGANIC	1.53	2593.69	6.31	54.15
BZ	VOLCANIC	1.88	2600.00	48.34	66.64
CA	ORGANIC	0.68	2648.34	20.19	24.04
CB	ORGANIC	0.91	2668.53	40.43	32.31
CC	ORGANIC	0.49	2708.97	56.96	17.36
CD	ORGANIC	2.71	2765.92	20.36	96.29
CE	NON-VOLCANIC	0.33	2786.28	8.16	11.86
CF	NON-VOLCANIC	0.74	2794.44	16.53	26.12
CG	ORGANIC	6.17	2810.97	41.46	218.89
CH	ORGANIC	1.48	2852.43	12.46	52.45
CI	DARK ORGANIC	0.94	2864.89	20.98	33.25
CJ	DARK CALCAREOUS	4.90	2885.87	46.79	173.92
CK	ORGANIC	6.99	2932.65	25.56	247.97
CL	ORGANIC	0.73	2958.22	47.07	26.04
CM	VOLCANIC	2.19	3005.29	12.87	77.74
CN	ORGANIC	1.16	3018.16	52.24	41.19
CO	ORGANIC	2.76	3070.40	13.08	98.04
CP	ORGANIC	0.77	3083.48	8.79	27.29
CQ	ORGANIC	4.52	3092.27	8.81	160.40
CR	VOLCANIC	1.44	3101.09	8.91	51.29
CS	VOLCANIC	6.47	3110.00	31.66	244.83
CT	ORGANIC	1.94	3141.66	102.99	73.42
CU	ORGANIC	0.42	3244.65	103.10	15.96
CU1	NON-VOLCANIC	0.39	3347.75	79.54	14.59
CV	DARK ORGANIC	1.53	3427.29	23.88	57.79
CW	CALCAREOUS	0.46	3451.17	31.88	17.44
CX	CALCAREOUS	0.70	3483.06	7.97	26.54
CX1	CALCAREOUS	0.18	3491.03	23.97	6.99

Turbidite ID	Turbidite Type	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³]
CX2	ORGANIC	1.15	3515.00	24.00	43.38
CY	CALCAREOUS	0.63	3538.99	40.05	23.83
CZ	VOLCANIC	0.85	3579.05	16.03	32.28
DA	CALCAREOUS DARK	0.46	3595.08	120.70	17.56
DA1	ORGANIC	2.14	3715.78	24.22	80.96
DB	VOLCANIC	1.81	3740.00	128.62	68.54
DC	ORGANIC DARK	1.84	3868.62	129.55	69.45
DD	ORGANIC	3.37	3998.17	21.64	127.62
DE	ORGANIC	1.17	4019.81	28.87	44.38
DF	VOLCANIC	0.34	4048.67	14.52	12.90
DG	NON- VOLCANIC DARK	4.05	4063.20	54.58	153.20
DH	ORGANIC	1.26	4117.77	7.30	47.66
DI	CALCAREOUS	1.84	4125.07	58.41	69.50
DJ	CALCAREOUS	0.21	4183.48	36.60	7.98
DK	VOLCANIC	1.67	4220.08	29.30	63.19
DL	VOLCANIC	0.46	4249.38	22.02	17.46
DM	ORGANIC	1.31	4271.41	14.78	49.54
DN	NON- VOLCANIC	4.32	4286.18	37.00	163.52
DO	ORGANIC	1.02	4323.18	7.40	38.56
DO1	CALCAREOUS	0.19	4330.58	7.41	7.35
DP	ORGANIC	0.91	4337.99	22.26	34.59
DQ	CALCAREOUS DARK	0.78	4360.25	29.75	29.47
DR	ORGANIC	1.51	4390.00	10.40	57.20
DS	ORGANIC	5.85	4400.40	41.65	221.40
DT	ORGANIC	0.89	4442.04	5.21	33.59
DU	VOLCANIC	0.89	4447.26	126.25	33.63
DV	ORGANIC	6.65	4573.50	10.55	251.30
DW	ORGANIC PALE	1.87	4584.05	10.58	70.67
DX	ORGANIC	1.92	4594.63	42.36	72.74
DY	VOLCANIC	0.92	4636.98	53.02	34.92
DZ	VOLCANIC	0.94	4690.00	9.23	35.73
EA	CALCAREOUS	0.94	4699.23	18.46	35.40
EB	CALCAREOUS DARK	0.22	4717.69	27.70	8.38
EB1	ORGANIC	0.28	4745.39	36.97	10.67
EC	CALCAREOUS	0.63	4782.35	9.30	23.64
ED	ORGANIC DARK	4.92	4791.65	27.98	186.00
EE	ORGANIC	2.07	4819.63	28.06	78.43
EF	NON- VOLCANIC	2.38	4847.70	47.06	89.84

Turbidite ID	Turbidite Type	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³]
EG	ORGANIC	2.71	4894.75	28.26	102.38
EH	VOLCANIC	0.62	4923.01	18.85	23.32
EI	VOLCANIC	0.49	4941.86	226.32	18.67
EI1	VOLCANIC PALE	0.10	5168.18	18.91	3.89
EJ	ORGANIC	2.04	5187.09	9.48	77.19
EK	VOLCANIC	1.68	5196.57	28.47	63.70
EL	CALCAREOUS NON-	1.04	5225.04	19.03	39.14
EM	VOLCANIC NON-	2.26	5244.07	9.52	85.51
EN	VOLCANIC DARK	0.82	5253.59	9.56	31.05
EO	ORGANIC DARK	3.00	5263.15	9.56	113.44
EO1	ORGANIC	0.27	5272.71	67.29	10.26
EP	ORGANIC PALE	4.36	5340.00	14.96	165.03
EQ	ORGANIC	2.67	5354.96	7.52	100.95
ER	ORGANIC DARK	4.94	5362.48	22.65	186.84
ES	ORGANIC PALE	3.22	5385.13	11.35	121.94
ET	ORGANIC PALE	1.72	5396.48	3.78	65.17
EU	ORGANIC NON-	0.21	5400.27	3.79	8.06
EV	VOLCANIC	1.84	5404.06	7.60	53.96
EW	CALCAREOUS NON-	1.30	5411.65	156.51	38.12
EX	VOLCANIC	4.23	5568.16	26.78	123.81
EY	CALCAREOUS DARK	1.51	5594.94	38.39	44.06
EZ	ORGANIC NON-	3.13	5633.34	73.36	91.52
FA	VOLCANIC NON-	5.00	5706.70	74.33	146.15
FB	VOLCANIC	12.21	5781.03	3.93	357.17
FC	CALCAREOUS	3.02	5784.96	3.93	88.42
FD	VOLCANIC	2.41	5788.89	55.42	70.54
FE	ORGANIC	5.80	5844.31	3.96	169.62
FE1	ORGANIC	0.45	5848.27	21.81	13.04
FF	CALCAREOUS NON-	0.96	5870.08	9.92	28.06
FG	VOLCANIC	1.12	5880.00	42.11	32.67
FH	ORGANIC	0.76	5922.11	193.21	22.23
FI	CALCAREOUS DARK	0.67	6115.32	70.60	19.63
FJ	ORGANIC	4.59	6185.92	7.12	134.27
FK	VOLCANIC	8.43	6193.04	99.75	246.48
FL	VOLCANIC	0.93	6292.79	49.93	27.21
FM	VOLCANIC	0.95	6342.72	7.14	27.91

Turbidite ID	Turbidite Type	Turbidite Thickness [m]	Derived Date [ka BP]	Recurrence Interval [ka]	Estimated Volume [km ³]
FN	CALCAREOUS	1.55	6349.86	150.14	45.25
FO	VOLCANIC	0.57	6500.00	262.94	16.65
FP	VOLCANIC DARK	1.69	6762.94	76.43	49.36
FQ	ORGANIC	0.85	6839.36	127.46	24.73
FR	VOLCANIC	0.39	6966.82	85.11	11.37
FS	VOLCANIC	1.53	7051.93	17.09	44.86

TABLE DR5: MARNOSO-ARENACEA, CABELLI SECTION DATA.

Turbidite volumes are calculated based on ponding across an area of 3,600 km² in accordance with correlations determined by Talling et al. (2007) over an area of 120 km x 30 km. These volumes are underestimates of the actual deposit volumes as this is only the exposed part of the paleobasin at the present day. It is interpreted that deposits continue beyond the exposed limits to an unknown extent. Structural reconstructions also suggest that the foredeep basin was twice as wide, at the time the studied interval was deposited, than the present day outcrop (Talling et al., 2007; Ricci Lucchi & Valmori, 1980; Van Wamel & Zwart, 1990). We therefore account for structural shortening of basin width by a factor of two, as in the revised Table DR5. For the corrected data, only one turbidite bed (annotated by '*' below) has a volume marginally less than 0.1 km³ (0.072 km³). Given considerable uncertainties in bed volume, it is reasonable to use a general bed volume threshold of 0.1 km³. Recurrence intervals are derived based on two biostratigraphic ages determined at the top and base of the interval.

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.21	0.73	4.79	0.756	1.512
0.14	0.03	0.20	0.504	1.008
1.28	0.44	2.89	4.608	9.216
0.03	0.24	1.57	0.108	0.216
0.12	0.33	2.16	0.432	0.864
0.14	0.66	4.33	0.504	1.008
0.15	0.16	1.05	0.54	1.08
0.27	0.04	0.26	0.972	1.944
0.39	0.16	1.05	1.404	2.808
0.86	0.6	3.93	3.096	6.192
0.34	0.01	0.07	1.224	2.448
0.05	0.25	1.64	0.18	0.36
0.36	0.22	1.44	1.296	2.592
0.14	0.15	0.98	0.504	1.008
0.22	0.12	0.79	0.792	1.584
0.02	0.22	1.44	0.072	0.144
0.03	0.11	0.72	0.108	0.216
0.12	0.11	0.72	0.432	0.864
0.11	0.3	1.97	0.396	0.792
0.03	0.06	0.39	0.108	0.216
0.43	0.11	0.72	1.548	3.096
0.02	0.28	1.84	0.072	0.144
0.03	0.05	0.33	0.108	0.216
0.75	0.47	3.08	2.7	5.4
1.14	0.02	0.13	4.104	8.208
0.31	0.55	3.61	1.116	2.232
0.41	0.24	1.57	1.476	2.952
0.6	0.26	1.70	2.16	4.32
0.32	0.13	0.85	1.152	2.304
0.06	0.19	1.25	0.216	0.432
1.52	0.01	0.07	5.472	10.944
0.3	0.06	0.39	1.08	2.16
0.3	0.24	1.57	1.08	2.16
1.14	0.38	2.49	4.104	8.208
0.02	0.08	0.52	0.072	0.144
0.02	0.21	1.38	0.072	0.144
0.83	0.8	5.25	2.988	5.976

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
2.01	0.43	2.82	7.236	14.472
0.54	1.1	7.21	1.944	3.888
2.04	0.63	4.13	7.344	14.688
0.4	0.01	0.07	1.44	2.88
0.35	1.1	7.21	1.26	2.52
0.19	0.25	1.64	0.684	1.368
1.15	0.15	0.98	4.14	8.28
0.02	0.2	1.31	0.072	0.144
0.36	0.9	5.90	1.296	2.592
1.03	0.5	3.28	3.708	7.416
0.24	0.2	1.31	0.864	1.728
0.02	0.45	2.95	0.072	0.144
0.41	0.28	1.84	1.476	2.952
0.5	0.07	0.46	1.8	3.6
0.23	0.4	2.62	0.828	1.656
1.29	0.28	1.84	4.644	9.288
0.83	0.1	0.66	2.988	5.976
0.03	0.27	1.77	0.108	0.216
1.91	0.38	2.49	6.876	13.752
0.07	0.75	4.92	0.252	0.504
0.05	0.05	0.33	0.18	0.36
0.18	0.19	1.25	0.648	1.296
1.35	0.3	1.97	4.86	9.72
0.3	0.4	2.62	1.08	2.16
0.03	1.05	6.89	0.108	0.216
0.1	0.08	0.52	0.36	0.72
0.2	0.34	2.23	0.72	1.44
1.01	0.16	1.05	3.636	7.272
0.88	0.2	1.31	3.168	6.336
0.06	0.4	2.62	0.216	0.432
2.2	0.05	0.33	7.92	15.84
0.06	0.64	4.20	0.216	0.432
0.65	0.12	0.79	2.34	4.68
0.42	0.08	0.52	1.512	3.024
0.19	0.15	0.98	0.684	1.368
0.04	1.15	7.54	0.144	0.288
1.62	0.03	0.20	5.832	11.664
1.4	0.01	0.07	5.04	10.08
0.03	0.62	4.07	0.108	0.216
1.77	1.95	12.79	6.372	12.744
0.14	0.46	3.02	0.504	1.008
0.07	0.29	1.90	0.252	0.504
0.29	0.02	0.13	1.044	2.088
0.03	1.31	8.59	0.108	0.216
0.22	0.18	1.18	0.792	1.584
0.12	0.01	0.07	0.432	0.864
0.16	0.17	1.11	0.576	1.152
0.29	0.1	0.66	1.044	2.088
0.3	0.18	1.18	1.08	2.16
2.63	0.45	2.95	9.468	18.936

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
1.19	0.13	0.85	4.284	8.568
0.4	0.75	4.92	1.44	2.88
1.25	0.55	3.61	4.5	9
0.09	0.67	4.39	0.324	0.648
0.12	0.18	1.18	0.432	0.864
0.18	0.31	2.03	0.648	1.296
0.2	0.26	1.70	0.72	1.44
0.1	0.42	2.75	0.36	0.72
0.25	0.12	0.79	0.9	1.8
0.14	0.36	2.36	0.504	1.008
0.82	0.09	0.59	2.952	5.904
0.01	0.88	5.77	0.036	0.072*
1.3	0.81	5.31	4.68	9.36
0.88	0.8	5.25	3.168	6.336
0.31	0.01	0.07	1.116	2.232
1.35	0.06	0.39	4.86	9.72
0.22	0.18	1.18	0.792	1.584
0.06	0.07	0.46	0.216	0.432
0.05	0.02	0.13	0.18	0.36
0.13	0.23	1.51	0.468	0.936
0.44	0.03	0.20	1.584	3.168
0.37	0.13	0.85	1.332	2.664
0.12	0.29	1.90	0.432	0.864
0.14	0.15	0.98	0.504	1.008
1.3	0.27	1.77	4.68	9.36
0.11	0.12	0.79	0.396	0.792
0.1	0.73	4.79	0.36	0.72
0.26	0.08	0.52	0.936	1.872
1.21	0.55	3.61	4.356	8.712
0.04	0.25	1.64	0.144	0.288
0.04	0.15	0.98	0.144	0.288
0.26	0.3	1.97	0.936	1.872
0.81	0.18	1.18	2.916	5.832
0.1	0.48	3.15	0.36	0.72
0.05	0.15	0.98	0.18	0.36
0.03	0.57	3.74	0.108	0.216
2.41	0.24	1.57	8.676	17.352
3.55	0.65	4.26	12.78	25.56
1.13	0.27	1.77	4.068	8.136
1.65	0.77	5.05	5.94	11.88
0.11	0.69	4.52	0.396	0.792
0.24	0.01	0.07	0.864	1.728
0.19	0.01	0.07	0.684	1.368
0.03	1.27	8.33	0.108	0.216
0.12	0.09	0.59	0.432	0.864
0.05	0.18	1.18	0.18	0.36
0.34	0.03	0.20	1.224	2.448
0.26	0.21	1.38	0.936	1.872
0.56	0.28	1.84	2.016	4.032
0.22	0.12	0.79	0.792	1.584

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.79	0.71	4.66	2.844	5.688
0.24	0.17	1.11	0.864	1.728
0.48	0.06	0.39	1.728	3.456
0.03	0.18	1.18	0.108	0.216
0.27	0.02	0.13	0.972	1.944
1.42	0.05	0.33	5.112	10.224
0.17	0.03	0.20	0.612	1.224
2.44	0.01	0.07	8.784	17.568
0.59	0.3	1.97	2.124	4.248
0.3	0.38	2.49	1.08	2.16
0.17	0.46	3.02	0.612	1.224
0.15	0.04	0.26	0.54	1.08
1.35	0.54	3.54	4.86	9.72
0.25	0.12	0.79	0.9	1.8
0.1	0.11	0.72	0.36	0.72
0.34	0.67	4.39	1.224	2.448
0.2	0.19	1.25	0.72	1.44
0.02	0.18	1.18	0.072	0.144
2.27	0.06	0.39	8.172	16.344
0.09	0.23	1.51	0.324	0.648
1.41	0.75	4.92	5.076	10.152
0.3	0.22	1.44	1.08	2.16
0.27	0.04	0.26	0.972	1.944
0.15	0.06	0.39	0.54	1.08
0.11	0.04	0.26	0.396	0.792
0.15	0.05	0.33	0.54	1.08
0.12	0.05	0.33	0.432	0.864
0.1	0.03	0.20	0.36	0.72
0.81	0.02	0.13	2.916	5.832
0.17	0.02	0.13	0.612	1.224
0.12	0.07	0.46	0.432	0.864
1.81	0.23	1.51	6.516	13.032
0.19	0.01	0.07	0.684	1.368
0.94	0.26	1.70	3.384	6.768
0.35	0.25	1.64	1.26	2.52
0.24	0.13	0.85	0.864	1.728
0.15	0.04	0.26	0.54	1.08
0.04	0.72	4.72	0.144	0.288
1.25	0.06	0.39	4.5	9
0.18	0.13	0.85	0.648	1.296
2.21	0.38	2.49	7.956	15.912
0.11	0.32	2.10	0.396	0.792
0.18	0.34	2.23	0.648	1.296
0.25	0.01	0.07	0.9	1.8
1.72	0.1	0.66	6.192	12.384
0.22	0.43	2.82	0.792	1.584
0.18	0.17	1.11	0.648	1.296
0.08	0.15	0.98	0.288	0.576
0.08	0.12	0.79	0.288	0.576
0.43	0.12	0.79	1.548	3.096

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.7	0.04	0.26	2.52	5.04
1.93	0.4	2.62	6.948	13.896
0.23	0.45	2.95	0.828	1.656
0.13	0.04	0.26	0.468	0.936
0.29	0.28	1.84	1.044	2.088
0.13	0.62	4.07	0.468	0.936
0.09	0.1	0.66	0.324	0.648
0.09	0.03	0.20	0.324	0.648
1.25	0.48	3.15	4.5	9
0.27	0.12	0.79	0.972	1.944
0.04	0.3	1.97	0.144	0.288
0.13	0.18	1.18	0.468	0.936
0.7	0.08	0.52	2.52	5.04
0.14	0.02	0.13	0.504	1.008
0.12	0.4	2.62	0.432	0.864
0.28	0.06	0.39	1.008	2.016
0.91	0.01	0.07	3.276	6.552
0.14	0.27	1.77	0.504	1.008
0.21	0.27	1.77	0.756	1.512
0.16	0.06	0.39	0.576	1.152
0.03	0.33	2.16	0.108	0.216
0.15	0.07	0.46	0.54	1.08
0.13	0.02	0.13	0.468	0.936
0.21	0.33	2.16	0.756	1.512
0.15	0.02	0.13	0.54	1.08
0.45	0.46	3.02	1.62	3.24
0.09	0.02	0.13	0.324	0.648
0.98	0.01	0.07	3.528	7.056
0.22	0.14	0.92	0.792	1.584
0.56	0.26	1.70	2.016	4.032
0.23	0.45	2.95	0.828	1.656
0.23	0.01	0.07	0.828	1.656
0.05	0.1	0.66	0.18	0.36
0.27	0.36	2.36	0.972	1.944
0.08	0.22	1.44	0.288	0.576
0.17	0.18	1.18	0.612	1.224
0.45	0.11	0.72	1.62	3.24
0.04	0.05	0.33	0.144	0.288
0.05	0.15	0.98	0.18	0.36
1.84	0.22	1.44	6.624	13.248
0.43	0.42	2.75	1.548	3.096
0.31	0.62	4.07	1.116	2.232
1.01	0.11	0.72	3.636	7.272
0.97	0.34	2.23	3.492	6.984
0.15	0.04	0.26	0.54	1.08
0.04	0.03	0.20	0.144	0.288
3.41	0.04	0.26	12.276	24.552
0.75	0.1	0.66	2.7	5.4
0.06	0.4	2.62	0.216	0.432
0.05	0.52	3.41	0.18	0.36

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
1.6	0.06	0.39	5.76	11.52
0.11	0.45	2.95	0.396	0.792
0.15	0.01	0.07	0.54	1.08
0.44	0.27	1.77	1.584	3.168
1.36	0.26	1.70	4.896	9.792
0.12	0.25	1.64	0.432	0.864
0.27	0.34	2.23	0.972	1.944
0.15	0.12	0.79	0.54	1.08
0.09	0.08	0.52	0.324	0.648
0.1	0.1	0.66	0.36	0.72
0.14	0.14	0.92	0.504	1.008
0.1	0.02	0.13	0.36	0.72
0.18	0.04	0.26	0.648	1.296
2.4	0.08	0.52	8.64	17.28
1.81	0.05	0.33	6.516	13.032
0.96	0.54	3.54	3.456	6.912
0.2	0.05	0.33	0.72	1.44
0.16	0.06	0.39	0.576	1.152
0.87	0.28	1.84	3.132	6.264
1.45	0.04	0.26	5.22	10.44
0.89	0.03	0.20	3.204	6.408
0.26	0.04	0.26	0.936	1.872
1.74	0.15	0.98	6.264	12.528
1.75	0.21	1.38	6.3	12.6
0.29	0.22	1.44	1.044	2.088
1.14	0.11	0.72	4.104	8.208
0.88	0.1	0.66	3.168	6.336
0.37	0.12	0.79	1.332	2.664
0.25	0.48	3.15	0.9	1.8
0.18	0.06	0.39	0.648	1.296
0.21	0.3	1.97	0.756	1.512
0.12	0.19	1.25	0.432	0.864
0.16	0.01	0.07	0.576	1.152
0.43	0.02	0.13	1.548	3.096
0.09	0.18	1.18	0.324	0.648
0.89	0.25	1.64	3.204	6.408
2.48	0.04	0.26	8.928	17.856
0.07	0.31	2.03	0.252	0.504
1.77	0.05	0.33	6.372	12.744
1.82	0.64	4.20	6.552	13.104
0.12	0.08	0.52	0.432	0.864
0.11	0.43	2.82	0.396	0.792
0.23	0.07	0.46	0.828	1.656
1.67	0.01	0.07	6.012	12.024
0.11	0.16	1.05	0.396	0.792
0.63	0.01	0.07	2.268	4.536
0.2	0.21	1.38	0.72	1.44
2.18	0.01	0.07	7.848	15.696
0.25	0.39	2.56	0.9	1.8
1.44	0.14	0.92	5.184	10.368

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
1.65	0.12	0.79	5.94	11.88
0.34	0.31	2.03	1.224	2.448
0.08	0.19	1.25	0.288	0.576
0.02	0.21	1.38	0.072	0.144
1.2	0.04	0.26	4.32	8.64
1.21	0.06	0.39	4.356	8.712
0.17	0.04	0.26	0.612	1.224
1.8	0.33	2.16	6.48	12.96
1.53	0.56	3.67	5.508	11.016
0.21	0.11	0.72	0.756	1.512
0.09	0.33	2.16	0.324	0.648
0.28	0.1	0.66	1.008	2.016
1.12	0.45	2.95	4.032	8.064
0.19	0.5	3.28	0.684	1.368
0.76	0.12	0.79	2.736	5.472
0.09	0.56	3.67	0.324	0.648
1.11	0.32	2.10	3.996	7.992
0.11	0.15	0.98	0.396	0.792
0.95	0.13	0.85	3.42	6.84
0.15	0.55	3.61	0.54	1.08
1.79	0.19	1.25	6.444	12.888
0.11	0.42	2.75	0.396	0.792
0.95	0.39	2.56	3.42	6.84
0.07	0.66	4.33	0.252	0.504
0.12	0.25	1.64	0.432	0.864
0.18	0.06	0.39	0.648	1.296
0.18	0.01	0.07	0.648	1.296
4.99	0.01	0.07	17.964	35.928
0.04	0.28	1.84	0.144	0.288
0.33	0.61	4.00	1.188	2.376
0.18	0.01	0.07	0.648	1.296
1.24	0.29	1.90	4.464	8.928
0.12	0.11	0.72	0.432	0.864
0.09	0.13	0.85	0.324	0.648
0.03	0.39	2.56	0.108	0.216
0.03	0.1	0.66	0.108	0.216
0.13	0.01	0.07	0.468	0.936
0.12	0.17	1.11	0.432	0.864
1.99	0.33	2.16	7.164	14.328
0.31	0.18	1.18	1.116	2.232
0.15	0.83	5.44	0.54	1.08
1.47	0.04	0.26	5.292	10.584
0.21	0.29	1.90	0.756	1.512
0.16	0.19	1.25	0.576	1.152
0.53	0.05	0.33	1.908	3.816
0.92	0.4	2.62	3.312	6.624
0.09	0.46	3.02	0.324	0.648
0.56	0.18	1.18	2.016	4.032
0.4	0.01	0.07	1.44	2.88
1.59	0.37	2.43	5.724	11.448

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.49	0.08	0.52	1.764	3.528
0.02	0.22	1.44	0.072	0.144
0.09	0.53	3.48	0.324	0.648
0.26	0.15	0.98	0.936	1.872
0.71	0.01	0.07	2.556	5.112
0.1	0.04	0.26	0.36	0.72
0.09	0.07	0.46	0.324	0.648
0.07	0.36	2.36	0.252	0.504
0.12	0.02	0.13	0.432	0.864
0.23	0.02	0.13	0.828	1.656
0.64	0.13	0.85	2.304	4.608
2.34	0.19	1.25	8.424	16.848
0.16	0.19	1.25	0.576	1.152
6	0.35	2.30	21.6	43.2
0.15	0.21	1.38	0.54	1.08
0.27	0.01	0.07	0.972	1.944
0.29	0.96	6.30	1.044	2.088
0.19	0.08	0.52	0.684	1.368
0.64	0.47	3.08	2.304	4.608
1.31	0.21	1.38	4.716	9.432
1.72	0.33	2.16	6.192	12.384
0.06	0.03	0.20	0.216	0.432
0.3	0.02	0.13	1.08	2.16
2.52	0.01	0.07	9.072	18.144
0.16	0.67	4.39	0.576	1.152
0.17	0.09	0.59	0.612	1.224
1.53	0.01	0.07	5.508	11.016
0.38	0.17	1.11	1.368	2.736
0.34	0.01	0.07	1.224	2.448
0.39	0.08	0.52	1.404	2.808
0.13	0.1	0.66	0.468	0.936
0.24	0.71	4.66	0.864	1.728
0.13	0.12	0.79	0.468	0.936
0.21	0.01	0.07	0.756	1.512
0.04	0.3	1.97	0.144	0.288
0.68	0.11	0.72	2.448	4.896
0.43	0.11	0.72	1.548	3.096
0.77	0.01	0.07	2.772	5.544
2.22	0.4	2.62	7.992	15.984
0.84	0.84	5.51	3.024	6.048
0.19	0.94	6.16	0.684	1.368
0.79	0.4	2.62	2.844	5.688
0.9	0.01	0.07	3.24	6.48
0.3	0.2	1.31	1.08	2.16
0.21	0.2	1.31	0.756	1.512
0.85	0.01	0.07	3.06	6.12
1.17	0.32	2.10	4.212	8.424
0.12	0.41	2.69	0.432	0.864
0.26	0.01	0.07	0.936	1.872
0.05	0.29	1.90	0.18	0.36

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.16	1.12	7.34	0.576	1.152
2.31	0.21	1.38	8.316	16.632
0.53	1.2	7.87	1.908	3.816
0.05	0.13	0.85	0.18	0.36
0.7	0.01	0.07	2.52	5.04
0.41	0.13	0.85	1.476	2.952
0.1	0.17	1.11	0.36	0.72
0.28	0.01	0.07	1.008	2.016
0.74	0.46	3.02	2.664	5.328
0.18	0.06	0.39	0.648	1.296
1.11	0.2	1.31	3.996	7.992
0.22	0.01	0.07	0.792	1.584
0.4	0.01	0.07	1.44	2.88
0.22	0.4	2.62	0.792	1.584
0.16	0.05	0.33	0.576	1.152
0.91	0.08	0.52	3.276	6.552
0.68	0.01	0.07	2.448	4.896
0.13	0.63	4.13	0.468	0.936
1.21	0.01	0.07	4.356	8.712
0.85	0.19	1.25	3.06	6.12
0.09	0.12	0.79	0.324	0.648
0.27	0.01	0.07	0.972	1.944
0.31	0.42	2.75	1.116	2.232
0.89	0.19	1.25	3.204	6.408
11.4	0.47	3.08	41.04	82.08
0.11	0.19	1.25	0.396	0.792
0.23	0.22	1.44	0.828	1.656
1.55	0.07	0.46	5.58	11.16
0.72	0.06	0.39	2.592	5.184
0.04	0.12	0.79	0.144	0.288
0.27	0.15	0.98	0.972	1.944
0.88	0.08	0.52	3.168	6.336
0.09	0.15	0.98	0.324	0.648
0.27	0.02	0.13	0.972	1.944
0.29	0.32	2.10	1.044	2.088
1.4	0.37	2.43	5.04	10.08
2.14	0.17	1.11	7.704	15.408
0.13	0.02	0.13	0.468	0.936
1.48	0.2	1.31	5.328	10.656
0.32	0.19	1.25	1.152	2.304
0.11	0.11	0.72	0.396	0.792
0.22	0.02	0.13	0.792	1.584
0.09	0.3	1.97	0.324	0.648
2.08	0.33	2.16	7.488	14.976
0.02	0.14	0.92	0.072	0.144
0.24	0.15	0.98	0.864	1.728
2.29	0.14	0.92	8.244	16.488
0.22	0.15	0.98	0.792	1.584
0.07	0.05	0.33	0.252	0.504
0.18	0.26	1.70	0.648	1.296

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.25	0.35	2.30	0.9	1.8
0.8	0.21	1.38	2.88	5.76
0.13	0.13	0.85	0.468	0.936
0.03	0.34	2.23	0.108	0.216
0.02	0.17	1.11	0.072	0.144
0.1	0.08	0.52	0.36	0.72
1.75	0.08	0.52	6.3	12.6
0.47	0.01	0.07	1.692	3.384
1.54	0.52	3.41	5.544	11.088
0.07	0.11	0.72	0.252	0.504
0.02	0.32	2.10	0.072	0.144
0.3	0.38	2.49	1.08	2.16
0.17	0.26	1.70	0.612	1.224
0.27	0.11	0.72	0.972	1.944
0.45	0.01	0.07	1.62	3.24
0.76	0.21	1.38	2.736	5.472
3.43	0.01	0.07	12.348	24.696
0.13	0.12	0.79	0.468	0.936
0.08	0.07	0.46	0.288	0.576
0.24	0.2	1.31	0.864	1.728
1.55	0.34	2.23	5.58	11.16
0.48	0.35	2.30	1.728	3.456
0.25	0.12	0.79	0.9	1.8
0.1	0.14	0.92	0.36	0.72
0.51	0.15	0.98	1.836	3.672
0.34	0.01	0.07	1.224	2.448
0.31	0.11	0.72	1.116	2.232
0.25	0.37	2.43	0.9	1.8
0.86	0.26	1.70	3.096	6.192
0.13	0.15	0.98	0.468	0.936
0.17	0.01	0.07	0.612	1.224
0.22	0.45	2.95	0.792	1.584
0.9	0.12	0.79	3.24	6.48
1.36	0.05	0.33	4.896	9.792
0.1	0.35	2.30	0.36	0.72
0.15	0.2	1.31	0.54	1.08
0.12	0.15	0.98	0.432	0.864
0.1	0.01	0.07	0.36	0.72
2.11	0.1	0.66	7.596	15.192
1.63	0.01	0.07	5.868	11.736
0.16	0.12	0.79	0.576	1.152
0.55	0.1	0.66	1.98	3.96
0.79	0.1	0.66	2.844	5.688
0.26	0.01	0.07	0.936	1.872
0.2	0.01	0.07	0.72	1.44
0.16	0.04	0.26	0.576	1.152
0.23	0.01	0.07	0.828	1.656
0.37	0.25	1.64	1.332	2.664
0.17	0.17	1.11	0.612	1.224
0.2	0.06	0.39	0.72	1.44

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.13	0.16	1.05	0.468	0.936
0.64	0.01	0.07	2.304	4.608
0.38	0.01	0.07	1.368	2.736
0.18	0.23	1.51	0.648	1.296
1.55	0.08	0.52	5.58	11.16
0.13	0.35	2.30	0.468	0.936
0.12	0.1	0.66	0.432	0.864
1.67	0.01	0.07	6.012	12.024
0.58	0.11	0.72	2.088	4.176
0.3	0.1	0.66	1.08	2.16
2.33	0.03	0.20	8.388	16.776
0.15	0.01	0.07	0.54	1.08
0.18	0.01	0.07	0.648	1.296
0.15	0.1	0.66	0.54	1.08
2.94	0.04	0.26	10.584	21.168
0.1	0.13	0.85	0.36	0.72
0.06	0.16	1.05	0.216	0.432
1.33	0.11	0.72	4.788	9.576
0.16	0.03	0.20	0.576	1.152
1.07	0.02	0.13	3.852	7.704
0.28	0.1	0.66	1.008	2.016
0.07	0.08	0.52	0.252	0.504
0.42	0.02	0.13	1.512	3.024
0.16	0.23	1.51	0.576	1.152
0.39	0.13	0.85	1.404	2.808
0.79	0.01	0.07	2.844	5.688
2.08	0.06	0.39	7.488	14.976
0.13	0.03	0.20	0.468	0.936
0.51	0.61	4.00	1.836	3.672
0.13	0.06	0.39	0.468	0.936
0.61	0.01	0.07	2.196	4.392
0.2	0.01	0.07	0.72	1.44
0.28	0.04	0.26	1.008	2.016
0.87	0.04	0.26	3.132	6.264
0.31	0.01	0.07	1.116	2.232
0.28	0.74	4.85	1.008	2.016
0.52	0.02	0.13	1.872	3.744
0.42	0.03	0.20	1.512	3.024
2.01	0.28	1.84	7.236	14.472
0.3	0.22	1.44	1.08	2.16
0.31	0.3	1.97	1.116	2.232
0.3	0.22	1.44	1.08	2.16
3.35	0.07	0.46	12.06	24.12
0.64	0.07	0.46	2.304	4.608
0.93	0.02	0.13	3.348	6.696
0.16	0.03	0.20	0.576	1.152
0.23	0.33	2.16	0.828	1.656
0.19	0.08	0.52	0.684	1.368
0.22	0.02	0.13	0.792	1.584
0.42	0.11	0.72	1.512	3.024

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.25	0.28	1.84	0.9	1.8
0.13	0.24	1.57	0.468	0.936
0.11	0.18	1.18	0.396	0.792
0.21	0.15	0.98	0.756	1.512
0.06	0.1	0.66	0.216	0.432
1.2	0.48	3.15	4.32	8.64
0.16	0.13	0.85	0.576	1.152
0.09	0.14	0.92	0.324	0.648
1.43	0.17	1.11	5.148	10.296
0.18	0.31	2.03	0.648	1.296
0.78	0.22	1.44	2.808	5.616
0.03	0.16	1.05	0.108	0.216
0.58	0.17	1.11	2.088	4.176
0.22	0.31	2.03	0.792	1.584
2.34	0.35	2.30	8.424	16.848
0.2	0.01	0.07	0.72	1.44
0.26	0.15	0.98	0.936	1.872
0.3	0.01	0.07	1.08	2.16
0.11	0.11	0.72	0.396	0.792
0.03	0.02	0.13	0.108	0.216
0.38	0.12	0.79	1.368	2.736
0.21	0.26	1.70	0.756	1.512
0.14	0.13	0.85	0.504	1.008
0.16	0.49	3.21	0.576	1.152
0.16	0.04	0.26	0.576	1.152
0.39	0.01	0.07	1.404	2.808
1.74	0.23	1.51	6.264	12.528
0.2	0.21	1.38	0.72	1.44
0.16	0.2	1.31	0.576	1.152
0.09	0.13	0.85	0.324	0.648
0.08	0.06	0.39	0.288	0.576
0.23	0.04	0.26	0.828	1.656
5.27	0.14	0.92	18.972	37.944
0.24	0.28	1.84	0.864	1.728
0.3	0.02	0.13	1.08	2.16
0.1	0.02	0.13	0.36	0.72
1.55	0.05	0.33	5.58	11.16
0.19	0.03	0.20	0.684	1.368
0.13	0.04	0.26	0.468	0.936
0.21	0.03	0.20	0.756	1.512
0.22	0.09	0.59	0.792	1.584
0.21	0.24	1.57	0.756	1.512
0.34	0.04	0.26	1.224	2.448
0.39	0.05	0.33	1.404	2.808
0.09	0.06	0.39	0.324	0.648
0.05	0.03	0.20	0.18	0.36
0.32	0.05	0.33	1.152	2.304
0.27	0.25	1.64	0.972	1.944
0.23	0.05	0.33	0.828	1.656
0.58	0.02	0.13	2.088	4.176

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.45	0.01	0.07	1.62	3.24
0.84	0.05	0.33	3.024	6.048
0.2	0.04	0.26	0.72	1.44
0.15	0.03	0.20	0.54	1.08
0.31	0.01	0.07	1.116	2.232
0.08	0.03	0.20	0.288	0.576
0.05	0.01	0.07	0.18	0.36
1.22	0.01	0.07	4.392	8.784
1.06	0.02	0.13	3.816	7.632
0.17	0.23	1.51	0.612	1.224
0.4	0.01	0.07	1.44	2.88
0.14	0.14	0.92	0.504	1.008
0.18	0.31	2.03	0.648	1.296
0.27	0.03	0.20	0.972	1.944
0.19	0.02	0.13	0.684	1.368
0.44	0.18	1.18	1.584	3.168
1.96	0.3	1.97	7.056	14.112
1.43	0.22	1.44	5.148	10.296
0.53	0.18	1.18	1.908	3.816
0.23	0.09	0.59	0.828	1.656
0.32	0.03	0.20	1.152	2.304
0.15	0.02	0.13	0.54	1.08
0.07	0.06	0.39	0.252	0.504
0.5	0.11	0.72	1.8	3.6
0.22	0.05	0.33	0.792	1.584
0.88	0.01	0.07	3.168	6.336
1.03	0.29	1.90	3.708	7.416
0.72	0.18	1.18	2.592	5.184
0.11	0.16	1.05	0.396	0.792
4.57	0.2	1.31	16.452	32.904
0.07	0.02	0.13	0.252	0.504
0.11	0.06	0.39	0.396	0.792
0.11	0.1	0.66	0.396	0.792
0.3	0.02	0.13	1.08	2.16
0.15	0.12	0.79	0.54	1.08
0.27	0.46	3.02	0.972	1.944
0.22	0.16	1.05	0.792	1.584
0.44	0.21	1.38	1.584	3.168
0.18	0.12	0.79	0.648	1.296
0.13	0.15	0.98	0.468	0.936
0.02	0.02	0.13	0.072	0.144
0.22	0.03	0.20	0.792	1.584
1.03	0.13	0.85	3.708	7.416
0.13	0.03	0.20	0.468	0.936
0.12	0.23	1.51	0.432	0.864
0.15	0.16	1.05	0.54	1.08
0.09	0.27	1.77	0.324	0.648
0.22	0.65	4.26	0.792	1.584
0.14	0.1	0.66	0.504	1.008
0.16	0.19	1.25	0.576	1.152

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.22	0.43	2.82	0.792	1.584
0.26	0.01	0.07	0.936	1.872
0.2	0.21	1.38	0.72	1.44
0.23	0.19	1.25	0.828	1.656
2.12	0.01	0.07	7.632	15.264
0.5	0.4	2.62	1.8	3.6
0.18	0.96	6.30	0.648	1.296
0.15	0.15	0.98	0.54	1.08
0.19	0.22	1.44	0.684	1.368
0.72	0.16	1.05	2.592	5.184
0.13	0.07	0.46	0.468	0.936
0.42	0.59	3.87	1.512	3.024
0.16	0.27	1.77	0.576	1.152
0.39	0.01	0.07	1.404	2.808
1.82	0.52	3.41	6.552	13.104
0.03	0.09	0.59	0.108	0.216
0.08	0.51	3.34	0.288	0.576
0.11	0.21	1.38	0.396	0.792
0.29	0.12	0.79	1.044	2.088
0.4	0.21	1.38	1.44	2.88
0.13	0.3	1.97	0.468	0.936
0.55	0.16	1.05	1.98	3.96
0.16	0.91	5.97	0.576	1.152
0.37	0.11	0.72	1.332	2.664
0.43	0.38	2.49	1.548	3.096
1.47	0.22	1.44	5.292	10.584
0.15	0.04	0.26	0.54	1.08
0.06	0.4	2.62	0.216	0.432
0.1	0.03	0.20	0.36	0.72
0.15	0.02	0.13	0.54	1.08
0.13	0.02	0.13	0.468	0.936
0.08	0.36	2.36	0.288	0.576
0.08	0.12	0.79	0.288	0.576
0.52	0.22	1.44	1.872	3.744
0.65	0.08	0.52	2.34	4.68
0.04	0.03	0.20	0.144	0.288
0.35	0.1	0.66	1.26	2.52
0.68	0.05	0.33	2.448	4.896
0.05	0.08	0.52	0.18	0.36
1.4	0.18	1.18	5.04	10.08
0.1	0.21	1.38	0.36	0.72
0.13	0.01	0.07	0.468	0.936
0.45	0.02	0.13	1.62	3.24
0.14	0.16	1.05	0.504	1.008
0.29	0.11	0.72	1.044	2.088
0.1	0.01	0.07	0.36	0.72
0.1	0.09	0.59	0.36	0.72
0.39	0.09	0.59	1.404	2.808
0.18	0.04	0.26	0.648	1.296
0.15	0.09	0.59	0.54	1.08

Turbidite Thickness [m]	Hemipelagic Mud Thickness [m]	Recurrence Interval [ka] based on 15.25 cm/year	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and excludes correction for 2 x basin shortening	Minimum Calculated Volume [km ³] - assumes ponding over 3,600 km ² and includes correction for 2 x basin shortening
0.48	0.25	1.64	1.728	3.456
0.28	0.02	0.13	1.008	2.016
1.15	0.21	1.38	4.14	8.28
0.09	0.03	0.20	0.324	0.648
0.1	0.18	1.18	0.36	0.72
0.31	0.08	0.52	1.116	2.232
0.52	0.2	1.31	1.872	3.744
1.05	0.27	1.77	3.78	7.56
0.08	0.17	1.11	0.288	0.576

SUPPLEMENTARY ONLINE FIGURES

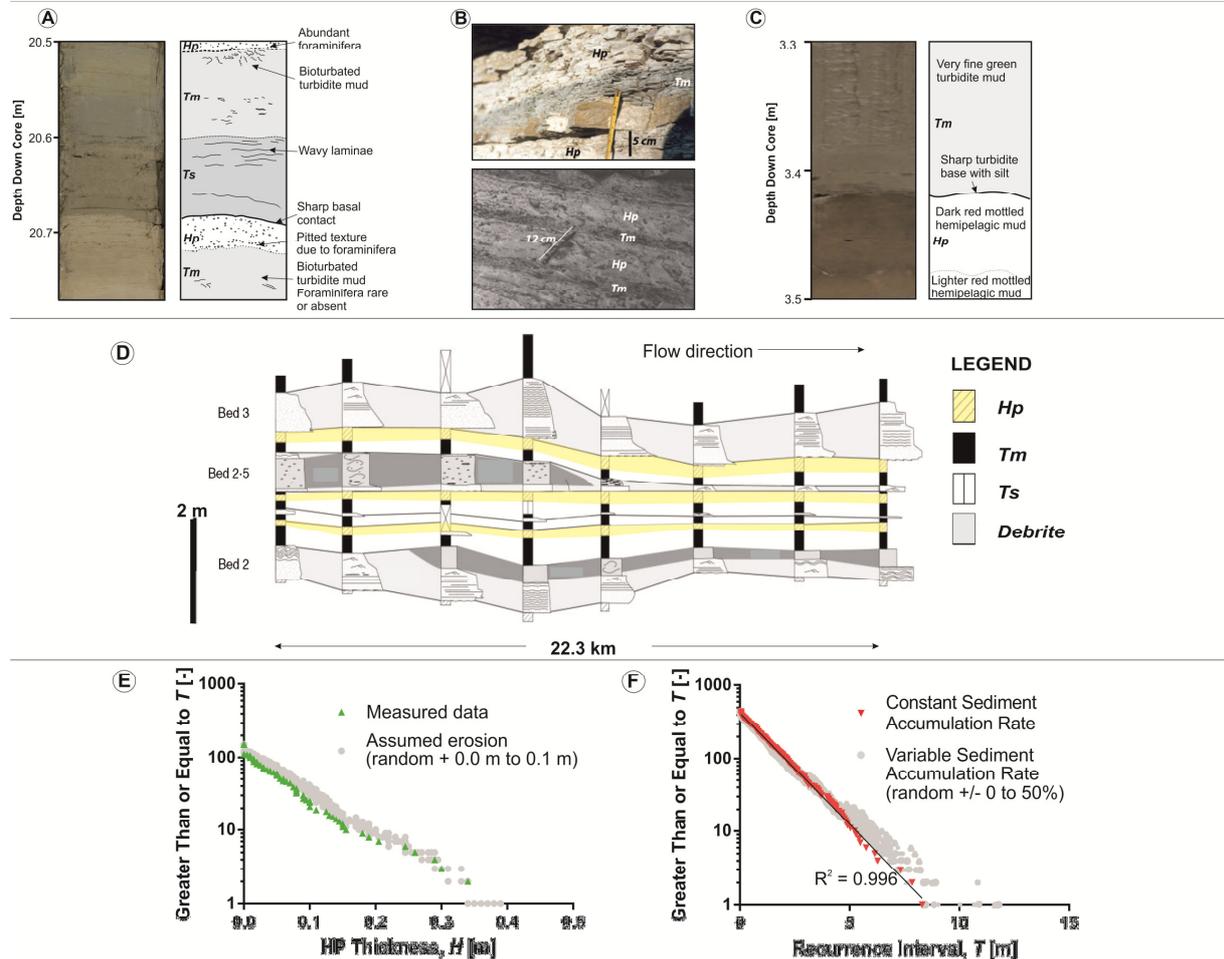


Figure DR1. Photos showing how hemipelagic beds are distinguished from the Balearic Abyssal Plain (A), Marnoso-arenacea Formation (B), and Madeira Abyssal Plain (C); (D) Example bed correlation in Marnoso-arenacea showing uniform hemipelagic bed thickness (Modified from Amy and Talling, 2006); Influence of erosion on hemipelagic thickness (E). Ten modified datasets (grey) account for random amounts of erosion (between 0.0 m and 0.1 m) below turbidites thicker than the mean bed thickness from the Balearic Abyssal Plain; Influence of short term variations in hemipelagic accumulation rates (F) – ten random datasets (grey) are plotted against the measured data for the Madeira Abyssal Plain to account for random variations between +/-50%.

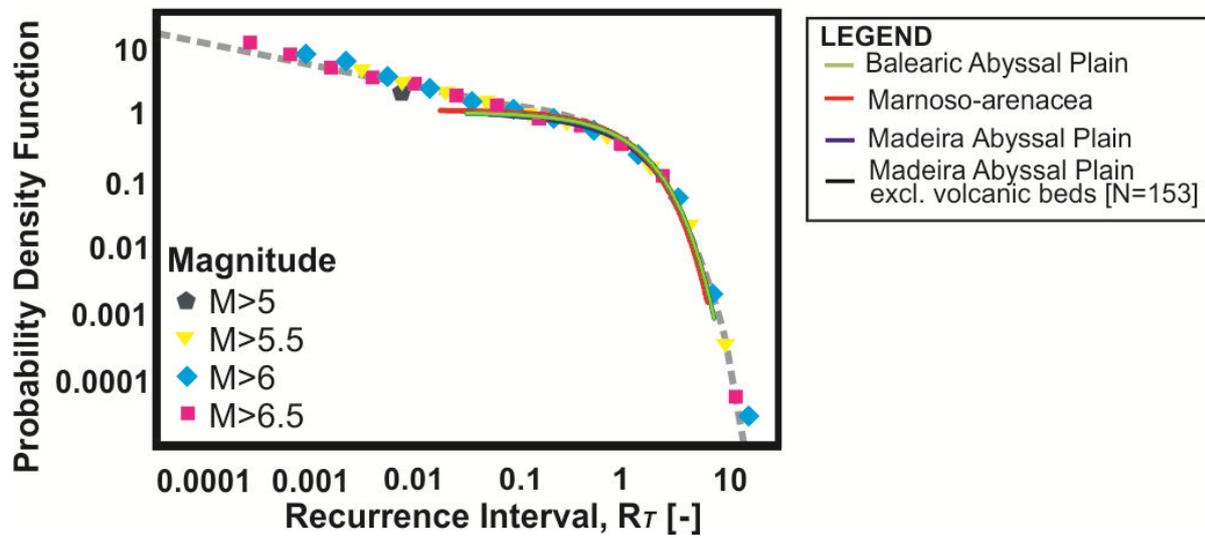


Figure DR2: Probability density function plot shows datasets (solid lines) superimposed on global earthquake data (points and dashed line) normalized to λ (modified from Corral, 2006).

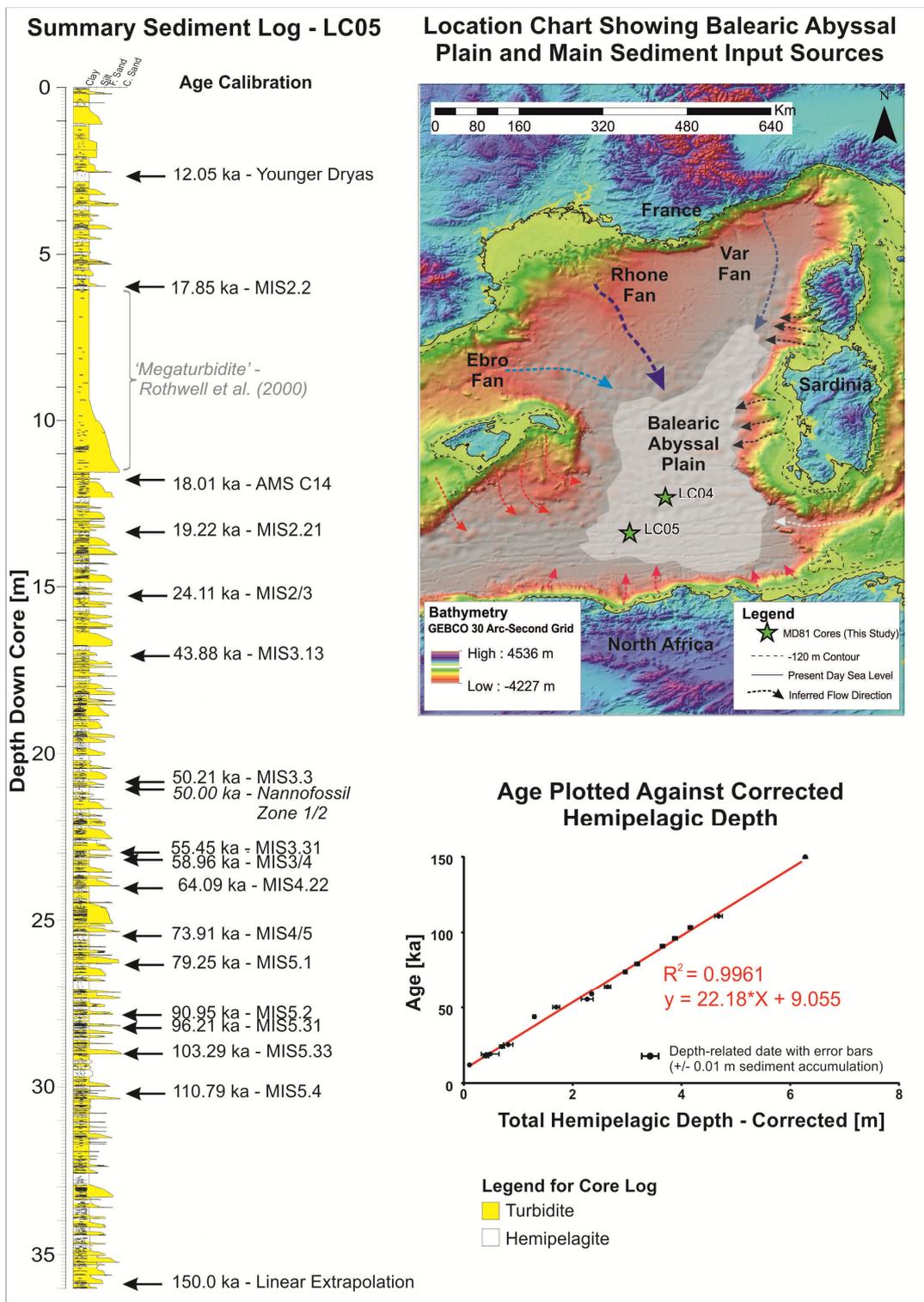


Figure DR3. Balearic Abyssal Plain. (A) Summary log showing age control, (B) Location map with flow sources arrowed. MIS refers to Marine Isotope Stage.

Lithological Log for 0-7Ma Record at ODP Site 951

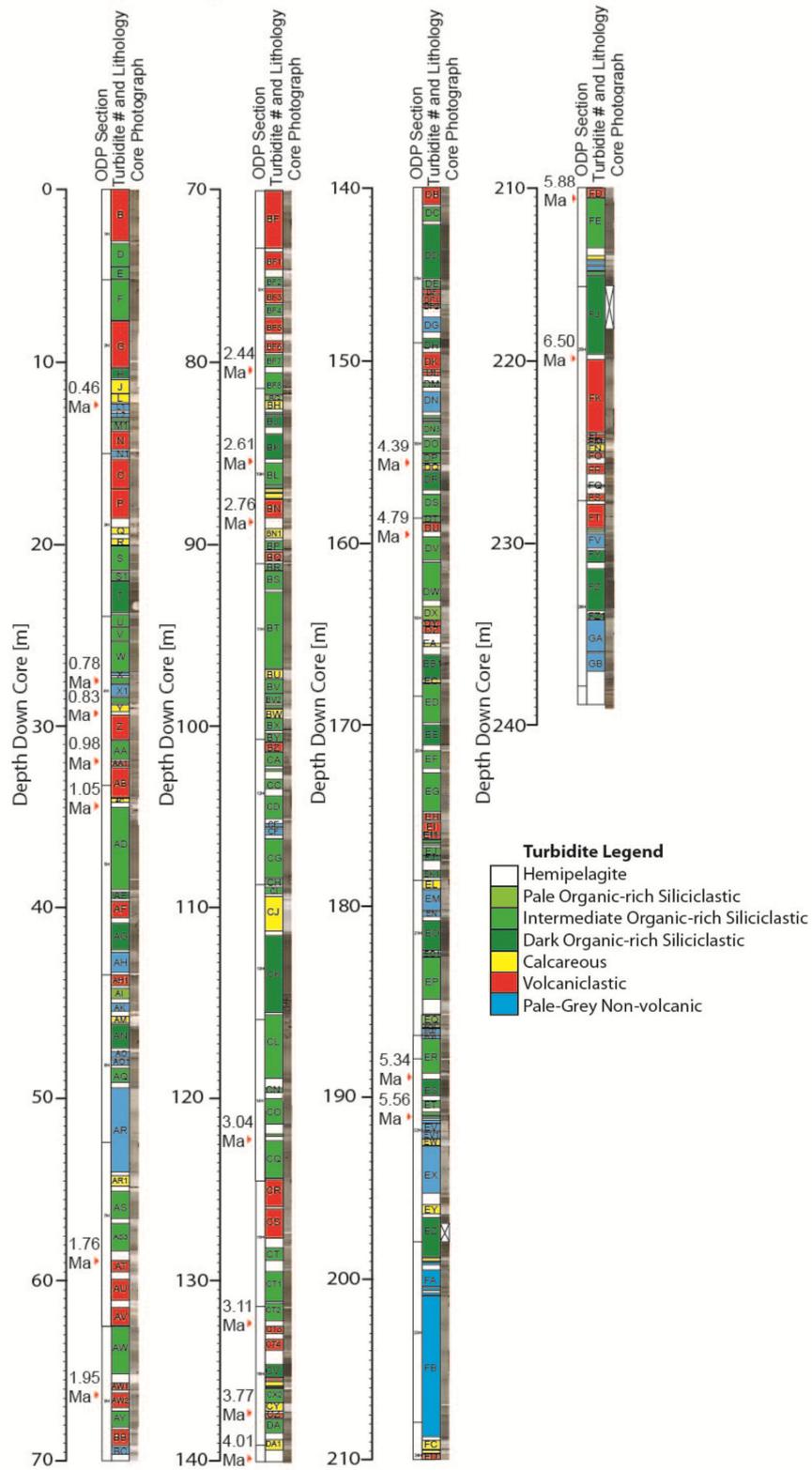
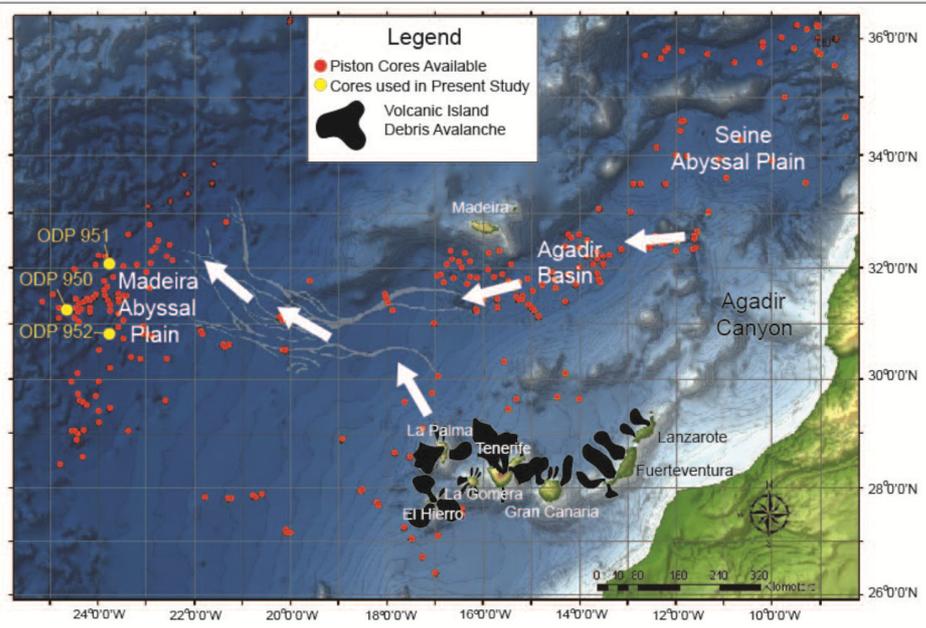


Figure DR4. Madeira Abyssal Plain - Summary log showing age control

A

Location Chart Showing Madeira Abyssal Plain and Turbidite Source Locations



B

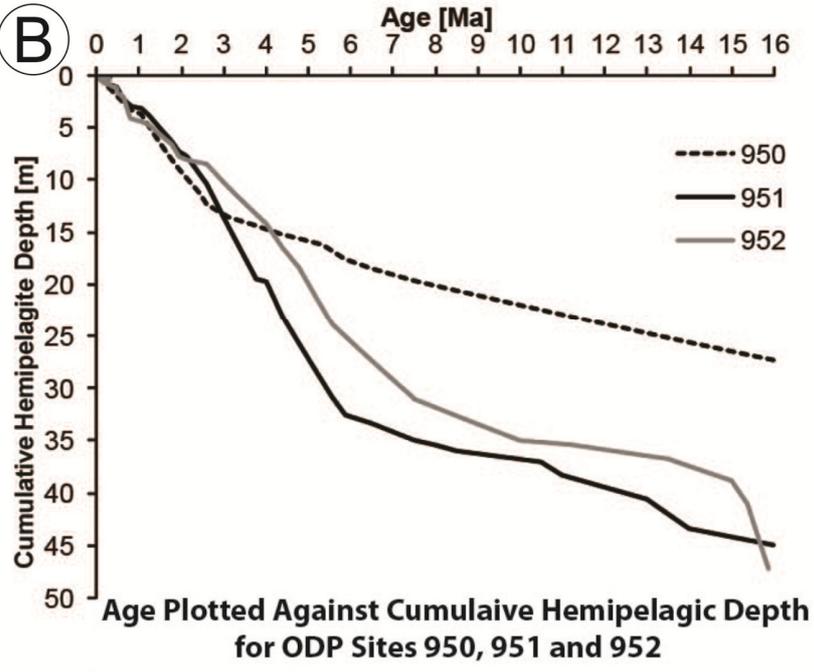
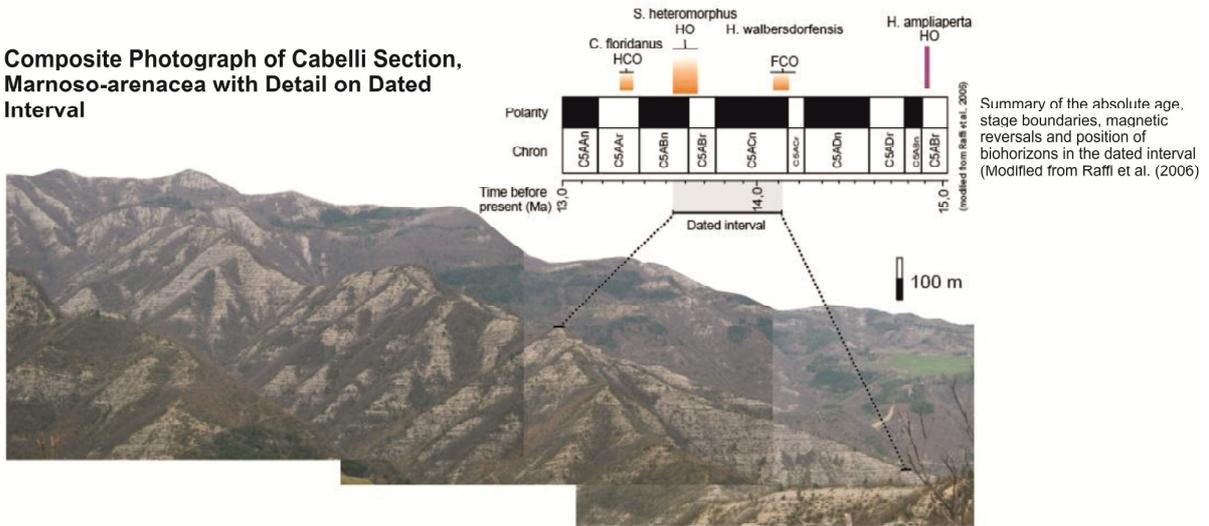


Figure DR5: Madeira Abyssal Plain: (A) Location map with flow sources arrowed; (B) Age plot for hemipelagic sedimentation. The age plots are relevant for the entire basin and allow for correlation of turbidites accurately between boreholes 950, 951 and 952.

Composite Photograph of Cabelli Section, Marnoso-arenacea with Detail on Dated Interval



Schematic Palaeogeographic Reconstruction of the Marnoso-arenacea During the Serravalian (After DiBase and Mutti, 2002)

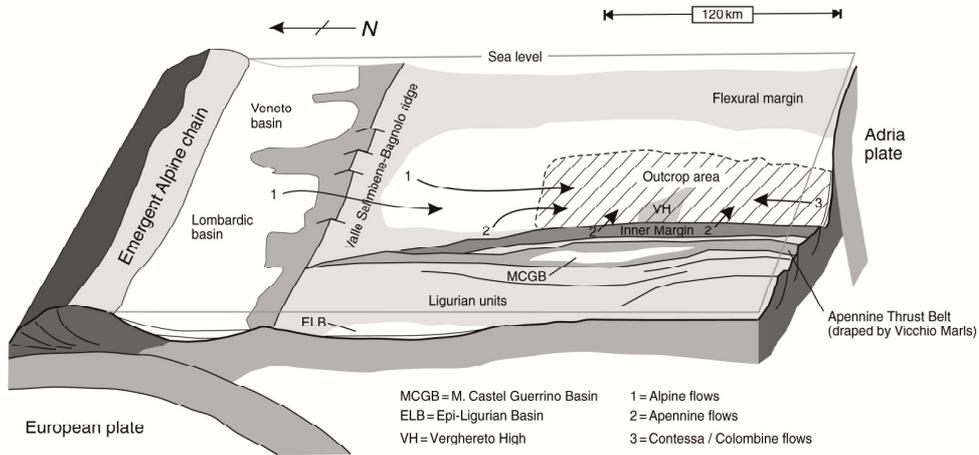


Figure DR6. Marnoso-arenacea Formation. (A) Photo of Cabelli section, (B) Palaeogeographic reconstruction with flow sources arrowed

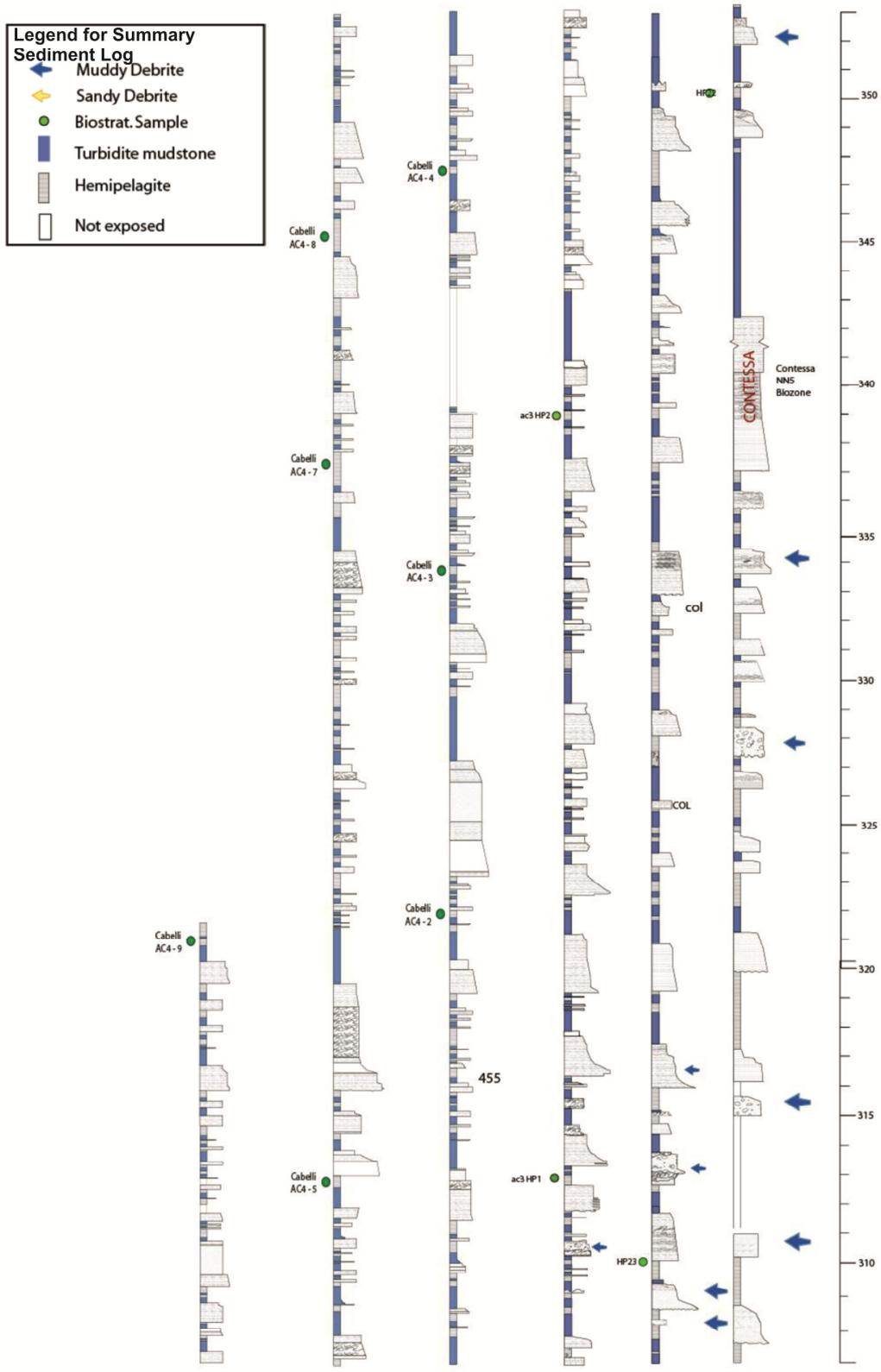


Figure DR7: Summary log at Cabelli showing age control (continued).

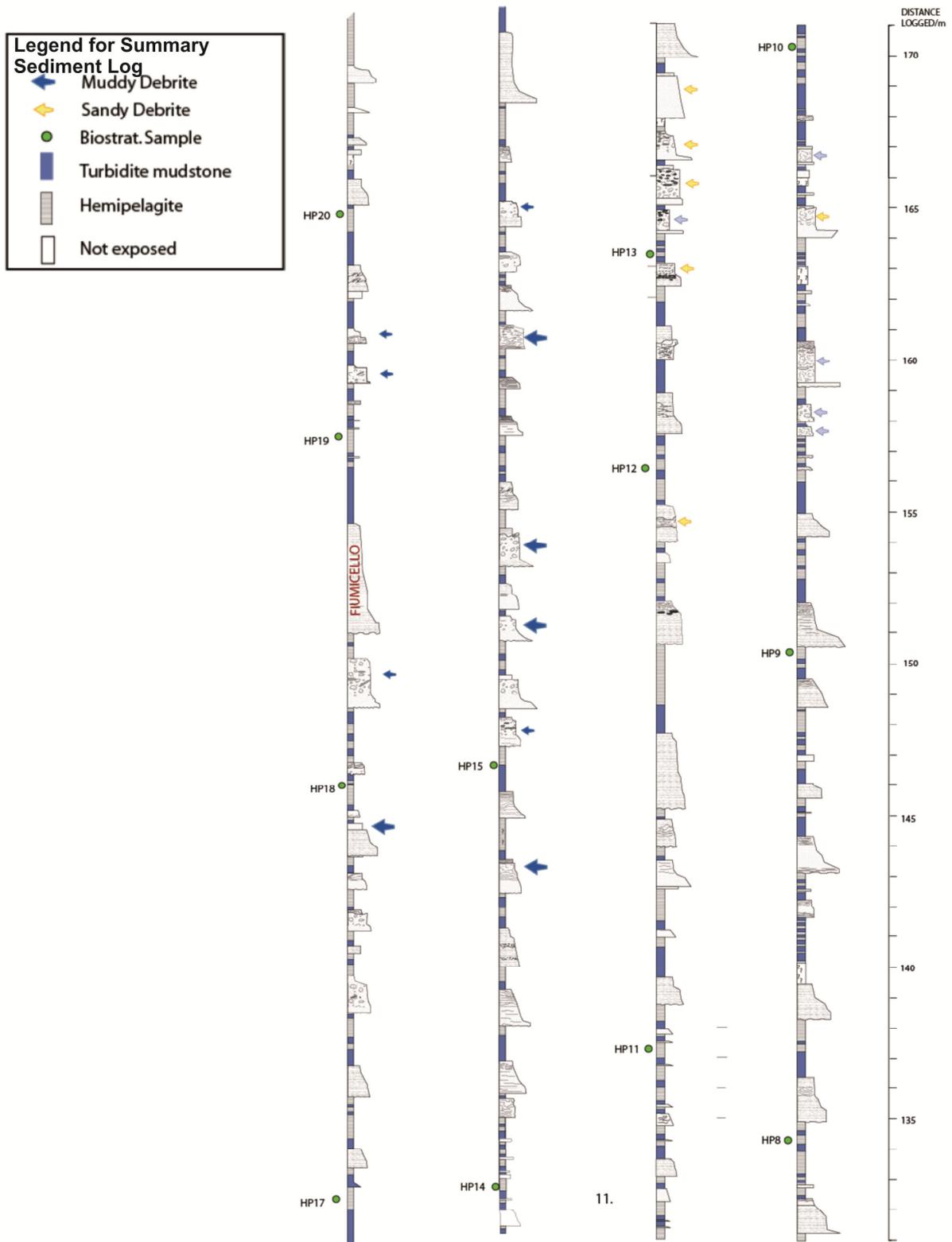


Figure DR7: Summary log at Cabelli showing age control (continued).

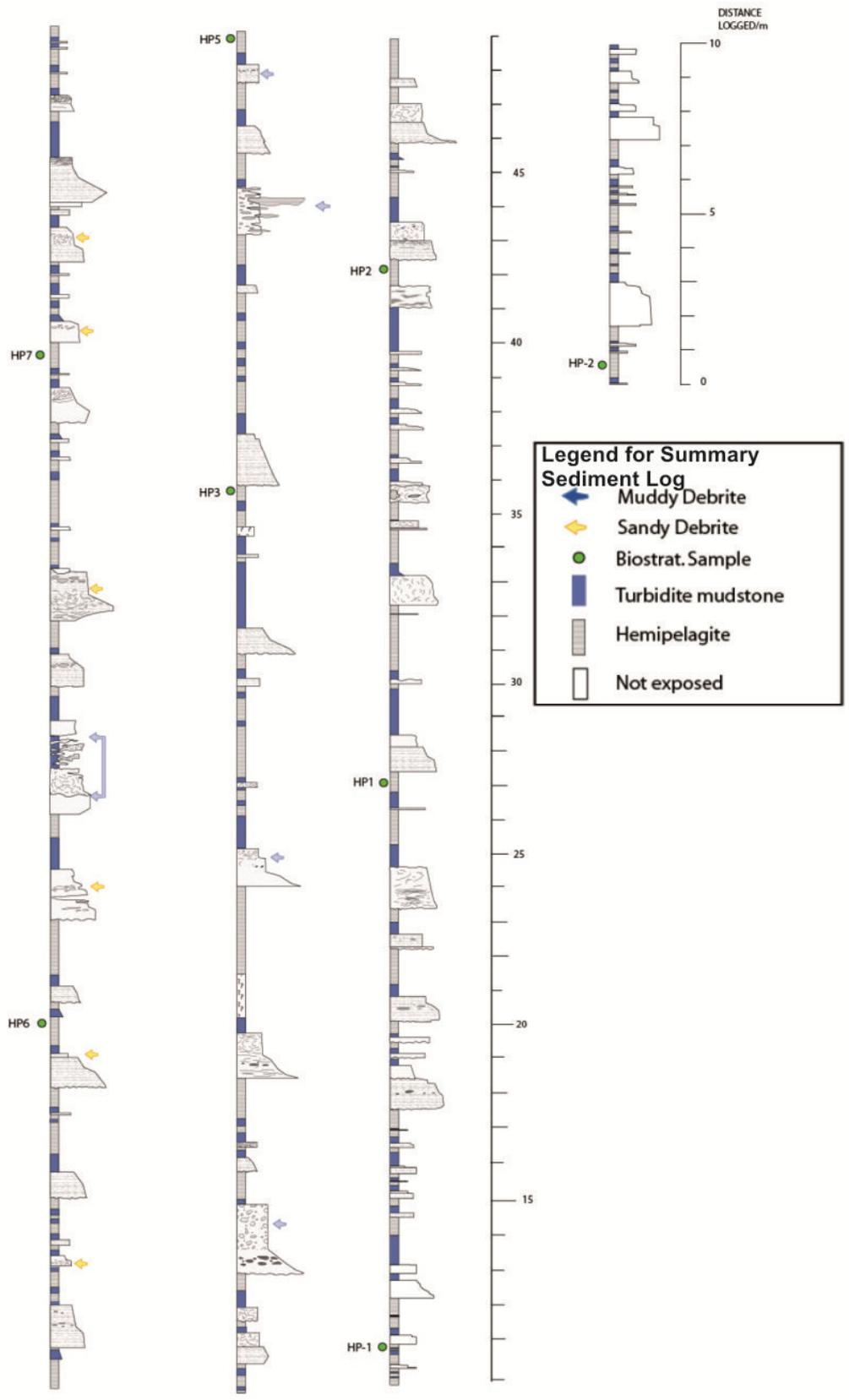


Figure DR7: Summary log at Cabelli showing age control