Supplementary Notes:

Table DR1

U/Th dating:

The U-Th isotope measurements were performed on a VG Elemental AXIOM MC-ICP-MS (multi collector – inductively coupled plasma – mass spectrometer) at the IFM-GEOMAR in Kiel. The method used is published by Fietzke et al. (2005) as multi-static MIC (multi-ion-counting) –ICP-MS approach, developed for high precision measurement on small sample amounts. For isotope dilution measurements a combined $^{233/236}$U / ^{229}Th-spike was used, with stock solutions calibrated for concentration using NIST-SRM 3164 (U) and NIST-SRM 3159 (Th), as combi-spike calibrated against CRM-145 uranium standard solution (also known as NBL-112A) for U-isotope composition and against a secular equilibrium standard (HU-1, uranium ore solution) for determination of ^{230}Th/^{234}U activity ratio.
Whole procedure blank values of this sample set were measured around 2 pg for Th and between 4 and 8 pg for U, which are in the typical range of this method and lab. Calculation of geochronological data and activity ratios are based on the decay constants given by Cheng et al. (2000).
All sub-samples were taken as powder with a micro-driller from fresh cutted surfaces of solid precipitates, after discarding first drill steps as surface cleaning procedure. Element separation procedure was based on eichrom-UTEVA resin.

Special Acknowledgement:
We grateful acknowledge Prof. A. Eisenhauer for support of the project and fruitful discussion about cold seep carbonate isotope systematic. Dr. J. Fietzke is especially acknowledged for maintaining the Axiom MC-ICP-MS on high performance for U-Th measurements and A. Kolevica as well as D. Mikschl for clean-lab support.

Table DR2

^{14}C dating:

Samples of wood fragments and surrounding carbonate sediment were analyzed at the Leibniz Laboratory for Radiometric Dating and Isotope Research at Kiel University. The samples were checked and mechanically cleaned under the microscope, afterwards sieved, and the dark organic-looking material < 250 µm was selected for further treatment. Conventional 14C ages were calculated following procedures described by Stuiver and Polach (1977) with a d13C correction for isotopic fractionation based on the ^{13}C/^{12}C ratio measured by the Accelerator Mass Spectrometer (AMS) system simultaneously with the ^{14}C/^{12}C ratio. The alkali extraction of the organic fraction (humic acid fraction) was precipitated with HCl, washed and dried, and afterwards also measured by the AMS-system. In addition to analytical uncertainty, there is some uncertainty due to possible sample contamination. Thus, the analyzed solid fraction of soil and sediment samples may be mixed with older carbon particles of methan hydrate.

Table DR3

Tephra correlation:

All tephra acronyms, belonging volcanic centers and ages that are used in this study are given in Table S3. Additionally, in Table S3 all marine and onshore tephra compositions are given which are used for correlations. Data are compiled from Kutterolf et al. (2008) and new data which have been obtained by the analytical procedure described in Kutterolf et al.(2008).

Special Acknowledgement:
We especially thank all members of the scientific parties of RV METEOR cruises M66/3 and M54/2 as well as RV SONNE cruise SO173/3 for the good and successful working atmosphere. We grateful acknowledge the professional work by Eric Steen and Mark Schmidt which did the coring. We also thank Ulrike Schacht, Oliver Bardtoff, Cosima Burkert, Kristina Bernoth, Emelina Cordero, Joana Deppe, Yann Lahaye, Julia Mahlke, Dagmar Rau and Mario Thöner who assisted sampling on board, sample preparation and analytical work.

Figure DR1a-c:
Figures a to c showing the composite sediment successions of all investigated cores and include the core descriptions as well as the „acticity zones" after the sediment description made in-house and on cruises M54/2, SO173/3 and M66/3 (cf. Brückmann and et, 2008; Flüh et al., 2004; Söding et al., 2003).

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In: J. Anal. At. Spectrom. 20 (2005), S. 395-401, DOI: 10.1039/b415958f: J Anal At Spectrom, v. 20, p. 395-401.

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Söding, E., Wallmann, K., Suess, E., and Flüh, E., 2003, Cruise Report M54/2+3: Fluids and Subduction, Costa Rica 2002, GEOMAR Report: Kiel, IFM-GEOMAR, p. 366.

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Figure DR1a

DR2008178

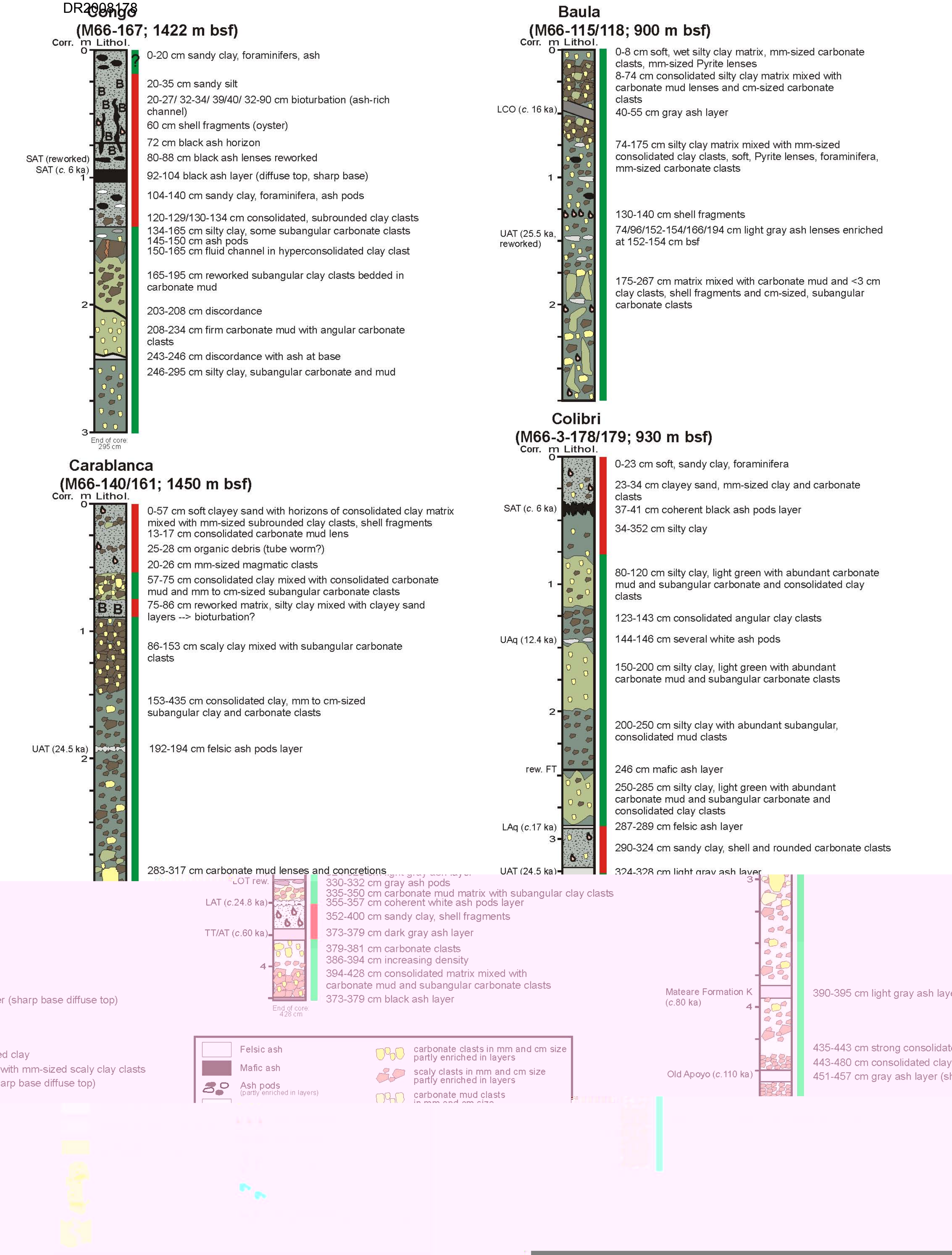

Figure DR1b

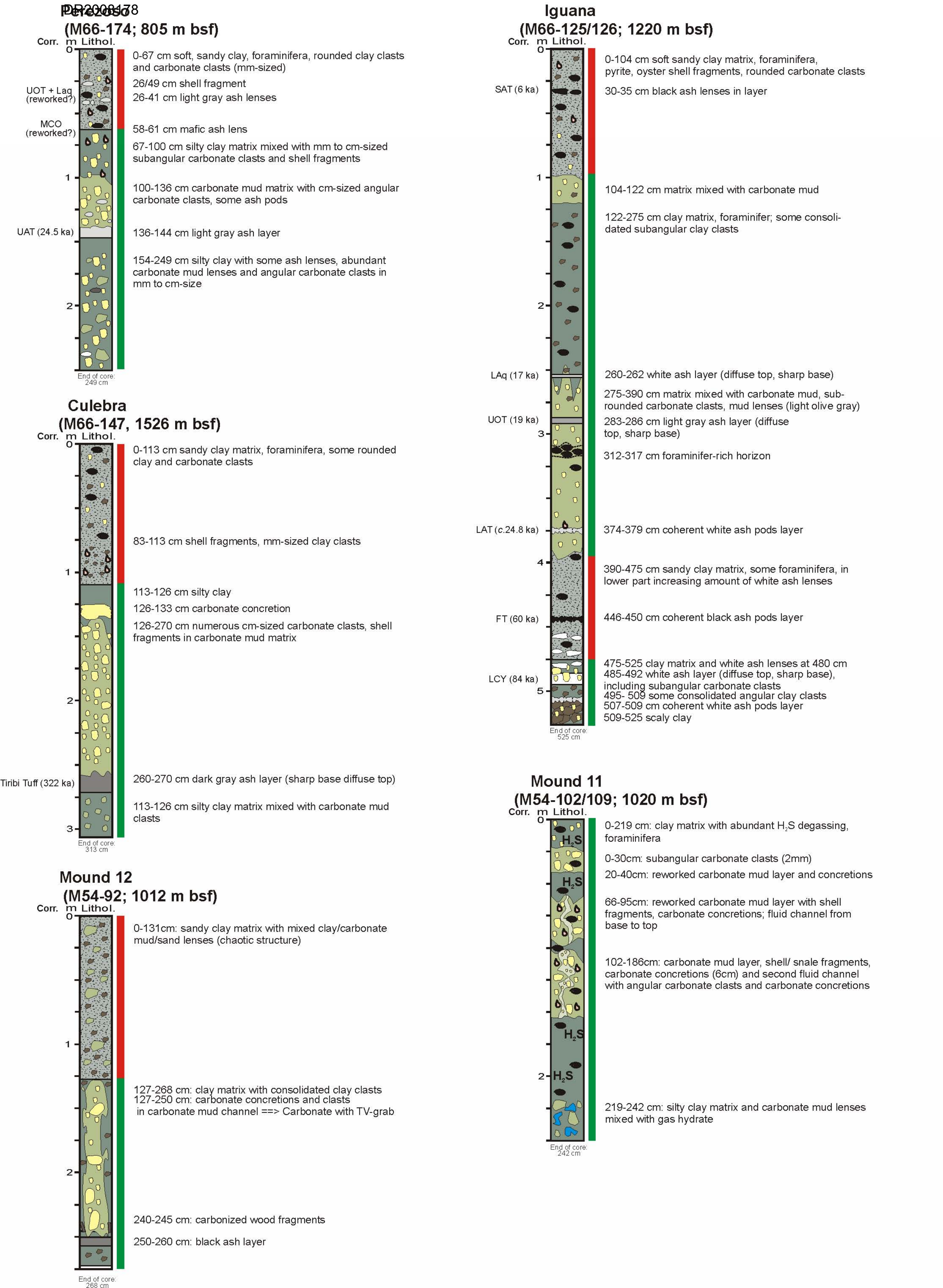
DR2008178
Perezoso
(M66-174; 805 m bsf)
Corr. m Lithol.
UOT + Laq (reworked?)
MCO (reworked?)
UAT (24.5 ka)
0-67 cm soft, sandy clay, foraminifera, rounded clay clasts and carbonate clasts (mm-sized)
26/49 cm shell fragment
26-41 cm light gray ash lenses
58-61 cm mafic ash lens
67-100 cm silty clay matrix mixed with mm to cm-sized subangular carbonate clasts and shell fragments
100-136 cm carbonate mud matrix with cm-sized angular carbonate clasts, some ash pods
136-144 cm light gray ash layer
154-249 cm silty clay with some ash lenses, abundant carbonate mud lenses and angular carbonate clasts in mm to cm-size
End of core: 249 cm
Culebra
(M66-147, 1526 m bsf)
Corr. m Lithol.
Tiribi Tuff (322 ka)
0-113 cm sandy clay matrix, foraminifera, some rounded clay and carbonate clasts
83-113 cm shell fragments, mm-sized clay clasts
113-126 cm silty clay
126-133 cm carbonate concretion
126-270 cm numerous cm-sized carbonate clasts, shell fragments in carbonate mud matrix
260-270 cm dark gray ash layer (sharp base diffuse top)
113-126 cm silty clay matrix mixed with carbonate mud clasts
End of core: 313 cm
Mound 12
(M54-92; 1012 m bsf)
Corr. m Lithol.
0-131cm: sandy clay matrix with mixed clay/carbonate mud/sand lenses (chaotic structure)
127-268 cm: clay matrix with consolidated clay clasts
127-250 cm: carbonate concretions and clasts
in carbonate mud channel ==> Carbonate with TV-grab
240-245 cm: carbonized wood fragments
250-260 cm: black ash layer
End of core: 268 cm
Iguana
(M66-125/126; 1220 m bsf)
Corr. m Lithol.
SAT (6 ka)
LAq (17 ka)
UOT (19 ka)
LAT (c.24.8 ka)
FT (60 ka)
LCY (84 ka)
0-104 cm soft sandy clay matrix, foraminifera, pyrite, oyster shell fragments, rounded carbonate clasts
30-35 cm black ash lenses in layer
104-122 cm matrix mixed with carbonate mud
122-275 cm clay matrix, foraminifer; some consolidated subangular clay clasts
260-262 white ash layer (diffuse top, sharp base)
275-390 cm matrix mixed with carbonate mud, subrounded carbonate clasts, mud lenses (light olive gray)
283-286 cm light gray ash layer (diffuse top, sharp base)
312-317 cm foraminifer-rich horizon
374-379 cm coherent white ash pods layer
390-475 cm sandy clay matrix, some foraminifera, in lower part increasing amount of white ash lenses
446-450 cm coherent black ash pods layer
475-525 cm clay matrix and white ash lenses at 480 cm
485-492 white ash layer (diffuse top, sharp base), including subangular carbonate clasts
495- 509 some consolidated angular clay clasts
507-509 cm coherent white ash pods layer
509-525 scaly clay
End of core: 525 cm
Mound 11
(M54-102/109; 1020 m bsf)
Corr. m Lithol.
H2S
0-219 cm: clay matrix with abundant H2S degassing, foraminifera
0-30cm: subangular carbonate clasts (2mm)
20-40cm: reworked carbonate mud layer and concretions
66-95cm: reworked carbonate mud layer with shell fragments, carbonate concretions; fluid channel from base to top
102-186cm: carbonate mud layer, shell/ snale fragments, carbonate concretions (6cm) and second fluid channel with angular carbonate clasts and carbonate concretions
219-242 cm: silty clay matrix and carbonate mud lenses mixed with gas hydrate
End of core: 242 cm

Figure DR1c

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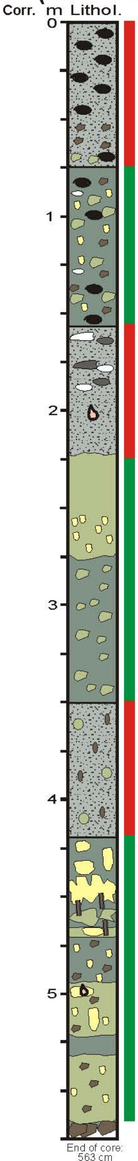
Mound 10

(SO173-40; 2283 m bsf)



0-40 cm top area lost

0-50 cm foraminifera rich sandy clay

50-67 cm few soft clay clasts

67-75 cm few small carbonate mud lenses

75-160 cm clay matrix with abundant carbonate mud lenses, subangular clay clasts, foraminifera and few small ash traces

85/105/107 cm traces of fossil biotubation

160-187 cm silty to sandy clay

160-187 cm light and dark gray cm-sized ash lenses

198 cm shell fragment (oyster)

225-275 carbonate mud matrix

256-275 cm 2-3 mm-sized angular carbonate clasts

275-355 cm clay matrix with abundant carbonate mud lenses, pyrite needles

355-418 cm sandy clay matrix with heterogen mixture of rounded carbonate mud lenses, clay clasts and abundant glauconite, plag, px and feslic as well as mafic glass shards in matrix

418-454 cm silty clay

418-439 cm cm-sized carbonate concretions

439-454 cm carbonate concretion layer

454-460 cm mixed carbonate mud and silty clay

446-475 cm carbonized wood fragments

460-465 cm carbonate mud and carbonate concretion

487-490 cm mm-sized angular clay and carbonate clasts

490-520 cm carbonate mud with few angular clay and carbonate clasts

497-500 cm carbonate concretion with shell fragments

510-520 cm carbonate concretion

520-533 cm firm silty clay

533-563 cm carbonate mud with few 5mm-sized carbonate clasts and some consolidated clay clasts

core catcher with scaly clay

Table DR1: U-series dating of carbonates

Kutterolf et al. Table DR1

U-series dating of carbonates using method after Fietzke et al. (2005) and decay constants after Cheng et al. (2000) at the Low-Temperature-Isotope-Geo-Chemistry-Lab (LTIGC) of IFM-GEOMAR-Kiel

LTIGC-lab-code	**project ident**	**sample amount (mg**	**U-Th-ingrowth mean age (ka)**	**+/- ka**	**+/- %**	**δ ^{234}U (t) (Note 2)**	**+/-**	**^{230}Th/^{232}Th act. ratio**	**+/-**	**^{238}U-conc. µg/g**	**+/-**	**^{232}Th conc. ng/g**	**+/-**	**δ ^{234}U (0) (Note 3)**	**+/-**	**sample depht [cm] in continous cores**
1248-06	M. Iguana 1	0,432 [1]	65.6	1.6	2.5	115.5	5.4	1012	27	*29.87*	*3.46*	*46.08*	*5.41*	139.1	6.1	1.5
1249-06	M. Iguana 2	15.53	32.1	0.5	1.6	122.8	3.8	1958	31	7.12	0.04	3.21	0.03	134.5	4.0	26.5
1250-06	M. Perezoso 1	7.60	70.3	1.3	1.9	111.4	5.2	2966	41	5.95	0.05	3.28	0.03	135.8	5.8	6
1252-06	M. Perezoso 2	24.85	55.8	1.6	2.8	111.1	5.4	428	12	1.46	0.01	4.71	0.08	130.1	6.1	61
1253-06	M. Baula 1	10.20	8.3	0.2	2.0	138.9	5.4	163	3	4.16	0.03	6.60	0.07	142.2	5.5	6.5
1255-06	M. Baula 2	45.86	5.6	0.1	1.9	149.9	3.5	1127	27	2.15	0.01	0.34	0.01	152.3	3.6	51
472-03	Mound 10	18.87	16.3	0.3	1.8	144.1	2.9	25.2	0.5	9.25	0.05	184.53	2.28	150.9	3.0	150
467-03-1	Mound 11/1	29.22	3.4	*0.1*	*2.9*	144.7	1.7	12.3	0.2	10.32	0.05	94.70	1.09	146.0	1.8	140
473-03	Mound 11/2	21.37	*9,1* [4]	*0.4*	*4.4*	135.0	2.5	4.1	0.1	28.37	0.14	2348.55	27.65	138.5	2.7	90
468-03	Mound 12	14.01	10.0	0.2	2.0	139.2	1.8	145.4	2.8	2.74	0.02	5.82	0.08	143.2	1.8	245

Note 1: sample weight close to limit of applied balance,
isotope ratios and age reasonable but concentrations are highly uncertain

Note 2: (meas. ^{234}U/^{238}U act. ratio -1) * 1000

Note 3: (^{234}U/^{238}U act. ratio at zero age -1) * 1000
measured ^{234}U/^{238}U back-calculated for ^{234}U decay since precipitation based on the individual U-Th ingrowth age

Note 4: increased uncertainty on age constrains
due to high ^{232}Th concentration combined with low ^{230}Th/^{232}Th activity ratio

Table DR2: 14C ages of clasts using

Kutterolf et al. Table DR2

Sampled core	Mound structure	Sample type	Depth below sea floor	Date BP Alkali	error	d13C(‰)	LAB #	Date BP Humic	error	d13C(‰)	Comments
So 173 40 446 - 475	Mound 10	wood	4.5 m	42490	+1870/-1520	-29.65 ± 0.14	KIA22563	--	--	--	enough C, reliable
So 173 40 446 - 475	Mound 10	carbonate clast	4.5 m	46360	+4680/-2940	-42.61 ± 0.11	KIA22563	--	--	--	reliable
M54 - 92 240 - 245	Mound 12	wood	2.5 m	--	--	--	KIA22564	17220	±160	-24.89 ± 0.06	enough C, reliable
M54 - 92 240 - 245	Mound 12	wood	2.5 m	19360	±90	-24.45 ± 0.08	KIA22564	--	--	--	enough C, reliable
M54 - 92 240 - 245	Mound 12	carbonate clast	2.5 m	22590	+220/-210	-51.90 ± 0.13	KIA22564	--	--	--	reliable

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Table DR3: Tephra correlation — **Kutterolf et al. Table DR3**

acronym	tephra name	eruption center	country	age (ka)	dating method/reference
SAT	San Antonio Tephra,	Masaya Caldera	Nicaragua	6	sedimentation rate (Kutterolf et al. 2007, 2008a)
Uaq	Upper Apoyeque Tephra,	Chiltepe volcanic complex	Nicaragua	12.4	14C (Kutterolf et al 2007)
LCO	Lower Cosigüina Tephra	Cosigüina volcano	Nicaragua	c.16	sedimentation rate
Laq	Lower Apoyeque Tephra,	Chiltepe volcanic complex	Nicaragua	c.17	sedimentation rate (Kutterolf et al. 2008a)
UOT	Upper Ometepe Tephra,	Ometepe Tephra	Nicaragua	c.19	sedimentation rate (Kutterolf et al. 2008a)
UAT	Upper Apoyo Tephra,	Apoyo Caldera	Nicaragua	24.5	14C (Kutterolf et al. 2007)
LAT	Lower Apoyo Tephra,	Apoyo Caldera	Nicaragua	24.8	14C (Kutterolf et al. 2007)
TT/AT	Twins/A-fall Tephra,	Berlin volcanic complex	El Salvador	c.60	sedimentation rate (Kutterolf et al. 2008a)
FT	Fontana Tephra,	Las Sierras Caldera	Nicaragua	c.60	sedimentation rate (Kutterolf et al. 2008a)
MF-K	Mateare Formation K	Chiltepe volcanic complex	Nicaragua	c.80	sedimentation rate
LCY	Los Chocoyos Tephra	Atitlán Caldera	Guatemala	84	delta 18O (Rose et al. 1999)
Old Apoyo	Old Apoyo Tephra	Apoyo Caldera	Nicaragua	c.110	sedimentation rate
Tiribi	Tiribi Tuff	Barva volcanic complex	Costa Rica	322	K/Ar (Perez et al. 2007)

Additional references:

Rose, W. I., F. M. Conway, C. R. Pullinger, A. Deino, and K. McIntosh (1999), An improved age framework for late Quaternary silicic eruptions in nothern Central America, Bull. Volcanol., 61, 106-120.

Pérez, W., G. E. Alvarado, and P. B. Gans (2006), The 322 ka Tiribi Tuff: Stratigraphy, geochronology and mechanisms of deposition of the largest and most recent ignimbrite in the Valle Central, Costa Rica, Bull. Volcanol., 69, 25-40.

correlated tephras per mound: major elements taken from Kutterolf et al. 2008a complemented by additional data

Mound	correlation	Tephra Layer	Na_2O	SiO_2	MgO	FeO_t	Al_2O_3	TiO_2	K_2O	CaO	Na2O+K2O	#
Congo												
	SAT	M66-167/95-105	2.94	52.40	4.24	13.15	15.29	1.21	1.35	9.02	4.28	35
			(0.53)	(0.88)	(0.53)	(1.20)	(0.80)	(0.19)	(0.23)	(0.61)	(0.58)	
Baula												
	LCO	M66-115/40-55	4.21	64.70	1.31	5.59	15.95	1.02	2.59	4.00	6.51	35
			(0.14)	(0.89)	(0.20)	(0.28)	(1.05)	(0.12)	(0.13)	(0.19)	(0.25)	
	UAT	M66-118/152-154	4.25	73.72	0.45	2.09	14.25	0.42	2.74	1.87	6.99	18
			(0.18)	(1.42)	(0.08)	(0.41)	(0.61)	(0.18)	(0.40)	(0.09)	(0.44)	
Carablanca												
	UAT	M66-140/192-194	4.49	73.75	0.38	2.05	14.11	0.46	2.55	2.03	7.04	20
			(0.10)	(0.34)	(0.03)	(0.11)	(0.20)	(0.11)	(0.07)	(0.07)	(0.12)	
	OMF-K	M66-161/390-395	3.28	64.97	1.78	6.59	15.66	0.88	1.37	5.07	4.66	14
			(0.47)	(1.09)	(0.33)	(0.67)	(0.52)	(0.15)	(0.10)	(0.37)	(0.41)	
	Old Apoyo upper	M66-140/451-457	3.31	77.41	0.20	1.46	12.68	0.28	3.06	1.49	6.37	16
			(0.15)	(0.51)	(0.04)	(0.18)	(0.23)	(0.13)	(0.13)	(0.14)	(0.14)	
Colibri												
	SAT	M66-178/37-41	3.02	52.01	4.39	12.41	15.79	1.33	1.36	9.15	4.39	12
			(0.35)	(0.71)	(0.58)	(0.64)	(0.58)	(0.21)	(0.25)	(0.73)	(0.55)	
	UAq (P)	M66-178/287-289	4.19	74.20	0.55	1.93	13.84	0.25	2.58	2.31	6.67	18
			(0.56)	(0.55)	(0.04)	(0.13)	(0.21)	(0.08)	(0.09)	(0.13)	(0.54)	
	LAq (P)	M66-178/287-289	4.00	75.10	0.36	1.88	13.65	0.21	2.77	1.91	6.78	24
			(0.10)	(0.34)	(0.07)	(0.11)	(0.22)	(0.03)	(0.11)	(0.14)	(0.14)	
	MCO (P)	M66-174/58	3.55	57.21	3.09	9.91	15.98	1.08	1.74	6.93	5.30	13
			(0.12)	(0.76)	(0.22)	(0.55)	(0.27)	(0.13)	(0.07)	(0.30)	(0.17)	
	UAT	M66-178/323-329	4.50	73.72	0.44	1.95	14.23	0.43	2.64	1.87	7.14	21
			(0.12)	(0.24)	(0.09)	(0.09)	(0.28)	(0.08)	(0.09)	(0.04)	(0.15)	
	LAT	M66-178/354-355	4.04	75.45	0.31	1.67	13.49	0.31	2.91	1.69	6.95	15
			(0.21)	(0.66)	(0.06)	(0.11)	(0.23)	(0.10)	(0.15)	(0.18)	(0.13)	
	TT/AT	M66-178/373-379	3.91	67.74	1.12	4.46	15.67	0.62	2.64	3.47	6.55	11
			(0.36)	(1.27)	(0.24)	(0.26)	(0.56)	(0.09)	(0.26)	(0.48)	(0.35)	
Perezoso												
	UOT (P)	M66-174/26-41	5.16	68.72	0.92	3.02	16.40	0.02	2.66	2.71	7.81	11
			(0.17)	(1.06)	(0.18)	(0.31)	(0.34)	(0.02)	(0.13)	(0.38)	(0.22)	
	LAq (P)	M66-174/26-41	4.07	75.17	0.35	1.81	13.57	0.19	2.92	1.76	6.99	17
			(0.20)	(0.69)	(0.08)	(0.16)	(0.35)	(0.02)	(0.13)	(0.17)	(0.19)	
	UAT (P)	M66-174/136-144	4.57	73.91	0.45	1.95	13.99	0.32	2.67	1.95	7.24	14
			(0.14)	(0.37)	(0.05)	(0.09)	(0.24)	(0.03)	(0.10)	(0.12)	(0.20)	
Culebra												
	Tiribi	M66-147/260-270	4.39	65.54	0.97	2.87	16.74	0.92	5.95	2.34	10.34	15
			(0.16)	(0.29)	(0.05)	(0.10)	(0.15)	(0.11)	(0.13)	(0.13)	(0.24)	
Iguana												
	SAT	M66-125/30-35	3.00	52.55	4.10	13.79	14.61	1.43	1.49	8.53	4.49	19
			(0.42)	(0.45)	(0.26)	(0.79)	(0.63)	(0.13)	(0.14)	(0.31)	(0.49)	
	LAq	M66-126/260-262	3.94	75.33	0.34	1.86	13.47	0.27	2.73	1.91	6.67	25
			(0.15)	(0.38)	(0.05)	(0.17)	(0.25)	(0.09)	(0.09)	(0.15)	(0.14)	
	UOT	M66-126/284-285	4.88	68.31	0.76	2.77	17.01	0.46	2.58	2.85	7.46	22
			(0.33)	(1.04)	(0.13)	(0.37)	(0.68)	(0.15)	(0.21)	(0.42)	(0.23)	
	LAT	M66-125/178-179	3.89	75.79	0.30	1.69	13.43	0.29	2.82	1.67	6.70	21
			(0.09)	(0.36)	(0.05)	(0.13)	(0.21)	(0.07)	(0.12)	(0.13)	(0.11)	
	FT	M66-125/271-273	3.26	55.66	3.52	11.17	15.49	1.28	1.65	7.41	4.91	20
			(0.40)	(2.82)	(0.83)	(2.31)	(1.06)	(0.30)	(0.22)	(1.11)	(0.58)	
	LCY	M66-125/271-273	3.59	77.96	0.09	0.63	12.89	0.09	4.03	0.64	7.62	15
			(0.15)	(0.25)	(0.02)	(0.12)	(0.09)	(0.04)	(0.16)	(0.06)	(0.23)	
	???	M66-125/cc	3.81	76.47	0.26	1.32	13.39	0.02	3.33	1.26	7.14	21
			(0.14)	(0.19)	(0.04)	(0.11)	(0.10)	(0.02)	(0.11)	(0.08)	(0.13)	

field tephras: major elements taken from Kutterolf et al. 2008a complemented by additional data

Field tephra	Na2O	SiO2	MgO	FeO	Al2O3	TiO2	K2O	CaO	Na2O+K2O
OMF-K (MF-K)	3.53	65.85	1.70	6.52	15.00	0.84	1.31	4.75	5.05
	(0.33)	(1.04)	(0.33)	(0.46)	(1.13)	(0.17)	(0.43)	(0.47)	(0.51)
Old Apoyo upper	3.57	76.76	0.31	1.53	13.02	0.19	2.77	1.66	6.65
	(0.58)	(0.89)	(0.12)	(0.29)	(0.31)	(0.11)	(0.22)	(0.09)	(0.39)
Tiribi Tuff (Tiribi)	4.03	66.37	0.87	3.71	16.33	0.88	4.81	2.41	0.29
	(0.43)	(2.02)	(0.34)	(1.16)	(0.69)	(0.14)	(0.71)	(0.83)	(0.91)
Upper Ometepe Tephra (UOT)	5.16	68.94	0.80	2.79	16.16	0.40	2.75	2.40	7.90
	(0.29)	(0.49)	(0.09)	(0.21)	(0.31)	(0.13)	(0.09)	(0.24)	(0.34)
San Antonio Tephra (SAT)	2.90	52.41	4.59	12.96	14.97	1.23	1.37	9.04	4.28
	(0.38)	(1.61)	(0.89)	(1.27)	(0.82)	(0.16)	(0.30)	(1.01)	(0.57)
Upper Apoyeque Tephra (UAq)	4.09	73.58	0.50	2.15	13.95	0.28	2.54	2.37	6.63
	(0.19)	(1.44)	(0.62)	(1.19)	(0.35)	(0.12)	(0.29)	(0.17)	(0.40)
Lower Apoyeque Tephra (LAq)	3.98	75.01	0.35	2.07	13.53	0.26	2.72	1.95	6.70
	(0.37)	(0.52)	(0.04)	(0.12)	(0.21)	(0.08)	(0.09)	(0.07)	(0.36)
Upper Apoyo Tephra (UAT)	4.43	73.50	0.50	2.10	14.21	0.45	2.70	1.91	7.13
	(0.44)	(0.83)	(0.29)	(0.30)	(0.54)	(0.15)	(0.15)	(0.26)	(0.46)
Lower Upoyo Tephra (LAT)	3.87	75.94	0.33	1.73	13.72	0.30	2.87	1.66	6.65
	(0.48)	(0.69)	(0.07)	(0.14)	(0.35)	(0.12)	(0.10)	(0.12)	(0.50)
Fontana Tephra (FT)	3.07	54.51	3.81	12.11	14.91	1.24	1.56	8.36	4.83
	(0.42)	(4.06)	(1.08)	(2.00)	(0.63)	(0.25)	(0.63)	(1.58)	(0.87)
Lower old cosigüina Tephra (LCO)	4.57	65.23	1.37	5.33	16.22	0.74	1.91	4.18	6.48
	(0.78)	(1.27)	(0.23)	(0.56)	(0.49)	(0.16)	(0.20)	(0.37)	(0.75)
Mafic Cosigüina (MCO)	3.91	58.94	2.68	8.89	16.07	1.00	1.35	6.18	5.26
	(0.42)	(1.49)	(1.15)	(1.60)	(1.63)	(0.21)	(0.45)	(0.69)	(0.61)
Twins/A-Fall Tephra (TT/AT)	4.64	67.72	1.09	4.07	15.90	0.44	2.27	3.53	6.94
	(0.34)	(1.14)	(0.23)	(0.48)	(0.49)	(0.31)	(0.19)	(0.39)	(0.48)
Chocoyos Fall (LCY-F)	3.72	77.92	0.10	0.51	12.93	0.13	3.98	0.42	7.70
	(0.26)	(0.28)	(0.02)	(0.07)	(0.15)	(0.08)	(0.07)	(0.06)	(0.22)