Supplemental Material

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Deep-Water Warming in the Gulf of Mexico from 2003 to 2019
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Deep-water warming in the Gulf of Mexico from 2003 to 2019

Table S.1. The thermistor used in the SBE41 and SBE41-CP has a manufacturer's stated accuracy of 0.002°C and stability of 0.0002°C yr^{-1}, or 2 m°C $decade^{-1}$

Mooring	Serial Number	Record start	Record end	Recording time	Bottom depth	mab
PER						
	5612	21-Sep-2008 17:00	11-Jul-2009 18:00	293d 01h	3528	8
	6620	12-Jul-2009 04:00	22-Jul-2010 10:00	375d 06h	3519	11
	6776	22-Jul-2010 19:00	20-Aug-2011 18:00	393d 23h	3510	11
	6777	21-Aug-2011 03:00	10-Sep-2012 12:00	386d 09h	3513	11
	6177	10-Sep-2012 19:00	19-Sep-2013 11:00	373d 16h	3530	11
	2018	19-Sep-2013 19:00	26-Aug-2014 21:00	341d 02h	3488	11
	6182	27-Aug-2014 06:00	28-Sep-2015 16:00	397d 10h	3504	11
	6174	29-Sep-2015 01:00	04-Apr-2017 11:00	553d 10h	3504	11
LMP						
	5616	22-Sep-2008 05:00	12-Jul-2009 11:00	293d 06h	3534	7
	5611	13-Jul-2009 00:00	23-Jul-2010 10:00	375d 10h	3513	11
	6179	23-Jul-2010 22:00	21-Aug-2011 10:00	393d 12h	3512	11
	5618	22-Aug-2011 01:00	11-Sep-2012 20:00	386d 19h	3524	11
	6777	12-Sep-2012 06:00	23-Sep-2013 21:00	376d 15h	3523	11

	6177	24-Sep-2013 05:00	28-Aug-2014 20:00	338d 15h	3495	11
	6170	29-Aug-2014 05:00	30-Sep-2015 11:00	397d 06h	3494	11
	6175	30-Sep-2015 18:00	06-Apr-2017 15:00	553d 21h	3503	11
	6168	07-Apr-2017 03:00	08-Jul-2018 15:00	457d 12h	3504	10
ARE						
	6174	14-Jul-2008 23:00	15-Jul-2009 11:00	365d 12h	3483	7
	6183	16-Jul-2009 01:00	26-Jul-2010 11:00	375d 10h	3489	11
	5615	26-Jul-2010 19:00	25-Aug-2011 10:00	394d 15h	3494	11
	5613	25-Aug-2011 19:00	14-Sep-2012 10:00	385d 15h	3503	11
	6179	14-Sep-2012 18:00	24-Sep-2013 10:00	374d 16h	3497	11
	6776	24-Sep-2013 19:00	31-Aug-2014 11:00	340d 16h	3475	11
	6927	31-Aug-2014 19:00	30-Sep-2015 19:00	395d 00h	3466	11
	6215	01-Oct-2015 04:00	07-Apr-2017 10:00	554d 06h	3478	11
	6174	07-Apr-2017 20:00	08-Jul-2018 08:00	456d 12h	3465	10
LNK						
	5615	19-Nov-2007 18:00	15-Jul-2008 10:00	238d 16h	3528	7
	6167	15-Jul-2008 23:00	15-Jul-2009 05:00	364d 06h	3534	7
	6181	16-Jul-2009 22:00	28-Jul-2010 15:00	376d 17h	3537	11
	5616	29-Jul-2010 01:00	25-Aug-2011 22:00	392d 21h	3548	11
	5611	26-Aug-2011 08:00	14-Sep-2012 21:00	385d 13h	3550	11

	5612	15-Sep-2012 05:00	05-Oct-2013 10:00	385d 05h	3561	11
	5617	05-Oct-2013 18:00	31-Aug-2014 22:00	330d 04h	3520	11
	6777	Record lost	malfunction	0	3529	11
	6775	02-Oct-2015 19:00	07-Apr-2017 21:00	553d 02h	3532	11
	5613	08-Apr-2017 07:00	22-Oct-2018 08:00	562d 01h	3531	11

Table S.2. Cruise information of 37 CTD profiles used in temperature trend calculations.

Cruise ID	Start Date	End Date	Notes	Funding
CNK_08	11-Aug-2003	30-Aug-2003	Cruises within the 'Canek Measuring Program' Recovery and installation of moorings, CTD profiles. PI. Dr. Julio Candela.	CANEK
CNK_09	23-Aug-2004	10-Sep-2004		
XIX_02	2-Jul-2011	16-Jul-2011	CTD profiles. Co-Pi: Dr. Sharon Z Herzka	INECC-SEMARNAT
XIX_03	9-Feb-2013	10-Apr-2013		
XIX_04	8-Aug-2015	16-Sep-2015	CTD profiles. Co-Pi: Dr. Sharon Z Herzka	SENER-CONACYT Hydrocarbon Fund (Consorcio de Investigación del Golfo de México, CIGOM)
XIX_05	10-Jun-2016	25-Jun-2016		
XIX_06	15-Aug-2017	8-Sept-2017		
XIX_07	9-May-2019	9-Jun 2019		

Table S.3. Mean transports below certain depth levels in Yucatan Channel, and corresponding flushing times of volumes (in $10^5 Km^3$) below isopycnals, within the GOM. The last column lists the equivalent degrees of freedom for the time series of transport into the GOM.

Zsill Yuc Str Of sigma0	Zgom Interior Of sigma0	Sigma0	Vol in GOM below Zgom	Area in GOM at Zgom $10^5 Km^2$	Resid flushing Time years	Transp Into GOM at Yuc (Sv)	Transp Outfl at Yuc Sv	*w* vert vel in vol. w/ Area/ cm/day	Neq de Transp into
1490	1512	27.7426	10.18	7.15	31.5±6.6	1.02±0.21	0.01±0.02	12.24±2.78	62.0
1510	1538	27.7442	9.99	7.09	33.1±7.1	0.96±0.21	0.01±0.02	11.53±2.72	61.7
1530	1565	27.7456	9.80	7.03	35.0±7.8	0.89±0.20	0.01±0.02	10.77±2.65	61.5
1550	1593	27.7469	9.61	6.97	37.3±8.6	0.82±0.19	0.01±0.02	9.99±2.57	61.3
1570	1623	27.7482	9.39	6.90	40.1±9.7	0.74±0.18	0.01±0.02	9.16±2.49	61.0
1590	1661	27.7494	9.14	6.82	43.6±11.2	0.66±0.17	0.01±0.02	8.29±2.42	60.5
1610	1705	27.7508	8.84	6.73	47.9±13.2	0.59±0.16	0.01±0.02	7.38±2.34	59.9
1630	1756	27.7522	8.49	6.63	52.8±15.7	0.51±0.15	0.01±0.02	6.51±2.26	59.6
1650	1814	27.7535	8.12	6.52	58.6±19.0	0.44±0.14	0.01±0.02	5.69±2.18	58.8
1670	1879	27.7548	7.70	6.39	65.1±22.9	0.37±0.13	0.01±0.02	4.93±2.09	58.5
1690	1958	27.7562	7.20	6.24	73.0±28.4	0.31±0.12	0.01±0.02	4.19±1.99	58.2
1710	2055	27.7575	6.60	6.04	81.2±35.0	0.26±0.11	0.01±0.02	3.55±1.92	57.4
1730	2165	27.7587	5.95	5.80	91.5±44.8	0.21±0.10	0.01±0.02	2.92±1.85	56.5
1750	2294	27.7598	5.22	5.52	101.0±55.5	0.16±0.09	0.01±0.02	2.41±1.77	56.4
1770	2471	27.7608	4.27	5.18	104.8±64.8	0.13±0.08	0.01±0.02	1.99±1.72	55.8
1790	2702	27.7618	3.13	4.75	100.8±71.3	0.10±0.07	0.01±0.02	1.61±1.69	55.2
1810	3037	27.7629	1.67	3.92	70.1±55.1	0.08±0.06	0.01±0.02	1.45±1.83	55.3
1830	3650	27.7642	0.10	1.17	5.9±5.1	0.06±0.05	0.01±0.02	3.44±5.36	55.6

A note of caution applies to the confidence intervals estimated for the residence time. These intervals follow from $(1+\varepsilon)^{-1} \approx 1-\varepsilon$ (i.e. from the confidence interval of transports in $\tau = Vol/Tr0$), an approximation which loses validity as $|\varepsilon|$ grows. Therefore, the large values are not accurate, nonetheless they have been left as a qualitative remainder of large uncertainties.