

Supplementary material 1

Results of the 115 heat flow sites acquired with the multi-penetration MCHF device during the WestMedflux cruise in 2016: Tw is temperature of near-bottom water; Zpen is penetration depth of lowest sensor; nK is amount of thermal conductivity (TC) measurements; TC is the harmonic mean of the thermal conductivity; nT is amount of temperature measurements in the sediments; TG is the average thermal gradient; and HF is the calculated heat flow.

MCHF site	Latitude (nord)	Longitude (east)	Tilt (°)	Tw (°C)	Zpen (m)	nK	TC (W/m/K)	σTC	nT	TG (mK/m)	σTG	HF (mW/m ²)	σHF
HF-01-01	42°19.630'	5°51.86'	1.6	13.34	5.01	0	1.327	0.150	7	41.1	1.1	54.5	6.3
HF-01-02	42°16.317'	5°45.534'	1.8	13.33	5.01	0	1.327	0.150	7	45.8	1.4	60.8	7.1
HF-01-03	42°9.418'	5°34.882'	1.0	13.33	5.02	6	1.308	0.042	7	43.9	3.5	57.4	4.9
HF-01-04	42°6.61'	5°29.677'	1.6	13.32	5.01	6	1.346	0.043	7	44.9	2.9	60.4	4.4
HF-02-01	41°8.397'	5°44.315'	2.3	13.37	3.32	6	1.221	0.096	6	50.4	3.4	61.5	6.4
HF-03-01	38°38.400'	5°12.239'	4.1	13.41	5.00	6	1.167	0.075	6	61.2	3.0	71.4	5.8
HF-03-02	38°41.678'	5°6.648'	2.8	13.4	5.01	6	1.204	0.047	7	59.7	2.2	71.9	3.9
HF-03-03	38°44.934'	5°1.115'	5.3	13.39	4.99	6	1.149	0.081	6	70.8	3.3	81.3	6.9
HF-03-04	38°48.181'	4°55.615'	1.4	13.38	5.01	6	1.666	0.108	6	83.7	4.6	139.4	11.9
HF-03-05	38°51.313'	4°50.277'	0.7	13.39	5.01	6	1.273	0.048	6	82.8	2.4	105.4	5.0
HF-03-06	38°51.321'	4°50.286'	1.5	13.37	5.01	6	1.292	0.055	7	83.1	16.6	107.4	21.9
HF-03-07	39°11.193'	3°54.233'	1.1	13.26	5.02	6	1.024	0.040	7	73.0	2.0	74.8	3.6
HF-03-08	39°4.410'	3°49.869'	1.5	13.26	5.01	6	1.004	0.026	7	67.1	1.0	67.4	2.0
HF-03-09	39°1.530'	3°45.503'	1.3	13.28	5.01	6	0.975	0.016	7	89.1	1.2	86.9	1.8
HF-03-10	38°58.411'	3°41.77'	1.4	13.31	5.01	6	1.065	0.035	7	81.4	1.2	86.7	3.1
HF-03-12	38°52.828'	3°35.122'	10.5	13.33	2.07	4	0.954	0.037	4	111.5	6.4	106.4	7.4
HF-04-01	39°6.889'	4°23.597'	2.3	13.29	5.01	6	1.072	0.040	7	73.1	2.4	78.4	3.9
HF-04-02	39°3.607'	4°29.244'	8.2	13.32	4.97	6	1.134	0.034	7	49.8	1.4	56.5	2.3
HF-04-03	39°0.559'	4°34.489'	5.3	13.35	4.99	6	1.156	0.025	7	42.6	0.9	49.2	1.5
HF-04-04	38°57.377'	4°40.120'	6.9	13.35	4.98	6	1.137	0.036	7	60.8	0.8	69.1	2.4
HF-04-05	38°54.460'	4°45.196'	4.4	13.36	5.00	6	1.074	0.047	7	64.0	0.7	68.7	3.1
HF-05-01	38°46.194'	6°14.600'	3.4	13.41	5.01	6	1.442	0.074	7	66.1	3.3	95.3	6.8
HF-05-02	38°48.198'	6°21.440'	3.4	13.42	5.01	6	1.115	0.050	7	64.4	3.6	71.8	5.1
HF-05-03	38°50.224'	6°27.904'	4.4	13.44	5.00	6	1.569	0.067	7	60.1	3.6	94.3	6.9
HF-05-04	38°52.155'	6°34.510'	2.2	13.42	5.01	6	1.520	0.083	7	57.0	3.5	86.6	7.1
HF-05-05	38°56.543'	6°48.391'	3.7	13.44	5.01	6	1.192	0.057	7	60.8	6.4	72.5	8.4
HF-05-06	38°59.266'	6°56.925'	3.1	13.43	4.36	6	1.145	0.044	5	60.9	0.9	69.7	2.9
HF-05-07	39°12.98'	7°13.724'	2.3	13.44	5.01	6	1.116	0.046	7	79.2	2.9	88.4	4.9
HF-05-08	39°11.610'	7°20.431'	2.0	13.37	4.37	6	1.031	0.026	6	74.2	1.5	76.5	2.5
HF-05-09	39°11.81'	7°28.264'	4.8	13.3	4.35	5	1.139	0.096	6	62.4	1.4	71.1	6.2
HF-05-10	39°10.834'	7°32.392'	2.8	13.34	4.90	6	1.097	0.013	7	60.6	0.8	66.5	1.2
HF-06-01	39°45.778'	7°40.839'	3.2	13.27	4.36	5	1.124	0.019	6	75.4	0.7	84.7	1.6
HF-06-02	39°46.129'	7°36.471'	3.1	13.29	5.01	6	1.065	0.036	7	55.5	1.7	59.1	2.7
HF-06-03	39°46.826'	7°28.780'	3.6	13.36	5.01	6	1.120	0.040	7	81.4	2.5	91.2	4.3
HF-06-06	39°49.691'	6°56.671'	2.2	13.41	5.01	6	1.203	0.083	7	60.2	1.6	72.4	5.4
HF-06-07	39°50.628'	6°45.721'	3.1	13.41	5.01	6	1.105	0.090	7	65.1	1.6	71.9	6.1
HF-06-08	39°50.807'	6°42.959'	21.6	13.41	4.66	6	1.002	0.086	7	71.4	2.5	71.5	6.6
HF-06-09	39°51.302'	6°37.364'	1.8	13.4	5.01	6	1.019	0.089	7	70.6	1.8	71.9	6.5
HF-07-01	38°21.210'	1°59.628'	2.8	13.22	3.88	5	1.046	0.056	6	55.1	1.8	57.6	3.6
HF-07-02	38°18.181'	2°1.966'	1.3	13.21	3.30	5	1.027	0.048	6	12.8	1.3	13.1	1.5
HF-07-03	38°15.198'	2°4.104'	9.8	13.21	4.27	5	1.011	0.038	6	38.2	1.1	38.6	1.8
HF-07-04	38°12.462'	2°6.214'	10.8	13.24	4.22	5	1.010	0.020	6	49.7	1.4	50.2	1.7
HF-07-05	38°9.496'	2°8.336'	7.3	13.27	4.09	5	1.187	0.060	6	70.7	2.0	83.9	4.9
HF-07-06	38°5.322'	2°11.572'	3.2	13.36	4.36	5	1.069	0.023	6	94.4	1.0	100.9	2.4
HF-07-07	38°4.554'	2°12.86'	3.7	13.36	4.36	5	1.052	0.009	6	82.7	1.4	87.0	1.7
HF-07-08	38°3.555'	2°12.843'	2.0	13.37	4.37	5	1.031	0.046	6	86.7	1.0	89.4	4.1
HF-07-09	38°2.335'	2°13.766'	2.9	13.37	4.36	5	1.023	0.052	6	89.1	0.8	91.1	4.7
HF-07-10	38°1.205'	2°14.581'	2.3	13.37	4.37	5	1.046	0.033	6	95.8	2.1	100.2	3.8
HF-07-11	38°0.665'	2°14.976'	2.5	13.38	4.37	5	1.036	0.065	6	90.5	0.7	93.8	5.9
HF-07-12	37°59.593'	2°15.774'	3.3	13.39	4.36	5	1.048	0.054	5	81.5	1.5	85.4	4.7
HF-07-14	37°57.949'	2°17.7'	2.3	13.4	4.37	5	1.120	0.046	6	113.2	1.1	126.8	5.4
HF-07-15	37°56.926'	2°17.828'	3.6	13.4	4.36	5	1.150	0.036	6	90.1	1.2	103.6	3.5
HF-07-16	37°56.93'	2°18.403'	3.1	13.39	4.36	5	1.112	0.112	5	78.1	2.7	86.8	9.2
HF-07-17	37°55.243'	2°19.27'	3.5	13.4	4.36	5	1.108	0.044	5	56.8	1.9	62.9	3.3
HF-07-18	37°54.802'	2°19.336'	1.6	13.4	4.37	5	1.152	0.054	5	68.1	2.4	78.5	4.6
HF-07-19	37°54.104'	2°19.972'	1.8	13.4	4.37	5	0.997	0.066	6	90.0	2.8	89.7	6.6
HF-07-20	37°52.750'	2°20.892'	1.8	13.43	4.37	5	1.059	0.046	6	92.1	1.6	97.5	4.6

Continuation of table (see explanation on previous page)

MCHF site	Latitude (nord)	Longitude (east)	Tilt (°)	Tw (°C)	Zpen (m)	nK	TC (W/m/K)	σTC	nT	TG (mK/m)	σTG	HF (mW/m ²)	σHF
HF-07-21	37°51.627'	2°21.756'	1.9	13.41	4.37	5	1.022	0.077	6	89.3	2.8	91.3	7.4
HF-07-22	37°50.798'	2°22.328'	3.8	13.41	4.36	5	1.150	0.109	6	101.6	3.6	116.8	11.8
HF-07-23	37°50.236'	2°22.702'	2.6	13.4	4.37	5	1.168	0.075	6	90.5	3.0	105.7	7.6
HF-07-24	37°49.684'	2°23.142'	1.1	13.39	3.62	5	1.246	0.180	5	80.0	5.5	99.7	15.9
HF-07-25	37°49.180'	2°23.533'	2.2	13.4	4.37	5	1.116	0.082	6	85.1	2.1	95.0	7.4
HF-07-26	37°48.209'	2°24.193'	1.9	13.4	4.37	5	0.996	0.045	6	91.6	3.9	91.2	5.7
HF-08-01	37°43.860'	1°22.831'	1.7	13.39	5.01	6	1.102	0.034	5	94.2	1.4	103.8	3.6
HF-08-02	37°44.928'	1°25.623'	3.3	13.39	5.01	6	1.053	0.011	6	98.8	1.5	104.0	1.9
HF-08-03	37°46.335'	1°28.635'	1.9	13.39	5.01	6	1.170	0.021	6	108.9	1.1	127.4	2.6
HF-08-04	37°47.766'	1°31.572'	2.3	13.4	5.01	6	1.114	0.042	7	94.7	2.9	105.5	5.1
HF-08-05	37°48.975'	1°34.542'	2.1	13.39	5.01	6	1.112	0.048	7	102.8	1.2	114.3	5.1
HF-08-06	37°50.404'	1°37.804'	2.6	13.38	5.01	6	1.116	0.037	6	99.9	4.3	111.5	6.1
HF-08-07	37°52.805'	1°43.367'	3.4	13.38	5.01	6	1.201	0.040	7	81.8	2.0	98.2	4.1
HF-08-08	37°54.751'	1°48.152'	2.3	13.38	5.01	6	1.151	0.026	7	89.6	1.1	103.1	2.7
HF-08-09	37°57.316'	1°53.961'	3.9	13.38	5.00	6	1.188	0.055	7	89.7	5.8	106.6	8.5
HF-08-10	37°58.717'	1°57.804'	2.5	13.36	2.31	4	1.113	0.016	4	104.2	7.9	116.0	8.9
HF-08-11	37°59.514'	2°0.766'	1.8	13.34	5.01	6	1.234	0.036	7	81.5	1.7	100.6	3.6
HF-08-12	37°59.709'	2°5.858'	1.7	13.34	5.01	6	1.175	0.040	7	80.5	0.7	94.6	3.3
HF-08-13	37°56.377'	2°8.254'	2.2	13.4	5.01	6	1.069	0.028	6	149.3	2.6	159.6	5.0
HF-08-14	37°58.692'	2°11.566'	1.9	13.39	4.98	6	1.202	0.035	7	113.3	1.9	136.2	4.6
HF-08-15	38°13.740'	2°0.383'	2.2	13.23	3.95	6	1.073	0.050	7	6.3	1.1	6.8	1.2
HF-08-16	38°16.981'	2°2.896'	2.6	13.21	4.87	6	1.067	0.043	6	30.5	1.6	32.5	2.2
HF-08-17	38°19.354'	2°4.390'	20.0	13.21	4.55	6	1.093	0.020	7	149.3	3.1	163.2	4.5
HF-08-18	38°19.759'	2°0.810'	21.0	13.2	4.46	6	1.049	0.027	7	50.2	1.4	52.7	2.0
HF-09-01	40°25.948'	3°8.955'	1.6	13.24	5.01	6	1.204	0.033	7	82.1	3.5	98.8	5.0
HF-09-02	40°29.664'	3°12.883'	2.6	13.26	4.54	6	1.118	0.039	7	54.8	0.6	61.3	2.2
HF-09-04	40°35.195'	3°19.27'	?	13.29	5.02	6	1.184	0.045	7	13.2	2.8	15.6	3.4
HF-09-05	40°38.806'	3°23.338'	2.6	13.3	5.01	6	1.112	0.052	7	38.7	1.3	43.0	2.5
HF-09-06	40°36.812'	3°29.926'	2.0	13.3	5.01	6	1.145	0.060	7	15.0	1.6	17.2	2.0
HF-09-07	40°34.222'	3°30.175'	?	13.29	3.63	6	1.180	0.029	7	0.6	5.4	0.7	6.4
HF-09-07b	40°34.222'	3°30.178'	?	13.29	2.99	6	1.166	0.036	7	-2.7	6.8	-3.1	7.9
HF-09-08	41°4.978'	3°52.670'	2.9	13.34	5.01	6	1.215	0.052	7	55.9	1.4	67.9	3.4
HF-09-09	41°7.847'	3°55.903'	5.5	13.34	4.99	6	1.146	0.033	7	54.6	1.3	62.6	2.3
HF-09-10	41°10.254'	3°58.641'	3.4	13.35	5.01	6	1.351	0.068	7	58.6	2.5	79.2	5.2
HF-09-11	41°12.699'	4°1.630'	6.7	13.34	4.98	6	1.127	0.049	6	38.8	2.8	43.7	3.7
HF-09-12	41°14.938'	4°4.758'	5.2	13.35	5.00	6	1.191	0.072	7	51.3	0.9	61.1	3.8
HF-09-13	41°17.296'	4°7.12'	4.5	13.35	5.00	6	1.125	0.039	7	38.3	1.4	43.1	2.2
HF-09-14	41°16.2'	4°15.910'	10.0	13.36	2.50	4	1.413	0.281	4	56.8	10.4	80.3	21.7
HF-10-01	42°14.331'	4°3.12'	8.4	13.21	4.96	6	1.136	0.066	7	45.3	0.9	51.5	3.2
HF-10-02	42°12.336'	4°5.658'	9.4	13.22	4.95	7	1.374	0.019	7	45.4	1.1	62.4	1.7
HF-10-03	42°9.899'	4°9.906'	2.6	13.23	5.01	7	1.326	0.042	7	39.0	0.8	51.7	2.0
HF-10-04	42°7.914'	4°12.899'	3.5	13.25	5.01	7	1.267	0.048	7	43.0	0.8	54.5	2.3
HF-10-05	42°6.52'	4°15.952'	4.6	13.26	5.00	7	1.282	0.042	7	42.3	0.7	54.2	2.0
HF-10-06	42°3.578'	4°19.776'	2.9	13.28	5.01	7	1.132	0.027	7	42.9	0.8	48.6	1.5
HF-10-07	42°1.990'	4°22.425'	7.0	13.29	4.98	7	1.338	0.069	7	45.1	0.6	60.3	3.2
HF-10-08	42°0.114'	4°25.429'	4.8	13.31	5.00	7	1.115	0.057	7	45.2	0.6	50.4	2.7
HF-10-09	41°58.962'	4°27.268'	6.7	13.32	4.98	7	1.073	0.035	7	55.8	0.8	59.9	2.1
HF-10-10	41°57.511'	4°29.493'	5.9	13.32	4.99	7	1.241	0.052	7	46.0	0.8	57.1	2.6
HF-10-11	41°56.784'	4°30.829'	6.2	13.33	4.99	6	1.317	0.023	7	47.6	1.9	62.7	2.7
HF-10-12	41°31.360'	5°1.348'	6.2	13.35	4.99	6	1.239	0.022	6	48.9	1.6	60.6	2.3
HF-10-13	41°32.605'	5°3.334'	5.0	13.34	5.00	6	1.051	0.050	6	51.5	1.3	54.1	2.9
HF-10-14	41°33.898'	5°4.874'	5.8	13.34	4.99	7	1.115	0.037	7	50.1	1.0	55.9	2.2
HF-10-15	41°34.573'	5°7.423'	6.5	13.34	3.92	7	1.250	0.045	7	44.6	1.1	55.8	2.4
HF-10-17	41°37.277'	5°10.501'	5.3	13.34	4.99	7	1.249	0.049	6	43.1	0.4	53.8	2.2
HF-10-18	41°36.740'	5°14.127'	6.4	13.33	4.98	6	1.120	0.021	6	35.8	0.8	40.1	1.2
HF-10-19	41°36.978'	5°16.939'	5.2	13.34	5.00	7	1.159	0.039	7	39.2	0.9	45.4	1.9

Supplementary material 2

Results of the 35 thermal measurements made using autonomous NKE temperature loggers on a gravity core during the Medsalt cruise (prefix GC) and on a Kullenberg corer during WestMedflux cruise (prefix KF & GF): Tw is temperature of near-bottom water; Zpen is penetration depth of lowest sensor; nK is amount of thermal conductivity (TC) measurements; TC is the harmonic mean of the thermal conductivity; nT is amount of temperature measurements in the sediments; TG is the average thermal gradient; and HF is the calculated heat flow.

Core	Latitude (nord)	Longitude (east)	Tilt (°)	Tw (°C)	Zpen (m)	nK	TC (W/m/K)	σTC	nT	TG (mK/m)	σTG	HF (mW/m ²)	σHF
GC-01	37°44.55'	2°11.57'	18.1	13.35	4.5	0	0.991	0.057	5	111.7	0.1	110.7	6.5
GC-02	37°52.08	2°11.3'	17.4	13.35	5.0	11	0.991	0.057	5	86.8	0.0	86.0	5.0
GC-03	38°2.38'	2°13.77'	20.7	13.33	4.7	41	1.023	0.051	5	83.4	0.0	85.3	4.2
GC-06	38°16.79'	1°58.69'	26.9	13.13	4.8	15	1.064	0.084	5	27.8	0.0	29.6	2.3
GC-07	38°41.67'	2°5.97'	40.7	13.11	3.1	11	1.080	0.057	5	84.4	1.4	91.1	6.3
GC-09	38°47.01'	2°14.62'	16	13.10	5.0	11	1.025	0.090	5	59.1	0.0	60.6	5.3
GC-10	38°54.81'	2°16.69'	17.7	13.11	4.8	13	1.036	0.190	5	69.8	2.4	72.3	15.8
GC-11	38°10.71'	2°8.65'	18.7	13.13	4.5	12	1.158	0.109	5	58.1	2.9	67.3	9.7
KF-01	42°1.447'	5°22.785'	0.9	13.25	9.2	31	1.315	0.110	7	44.3	1.7	58.3	5.5
KF-03	38°56.833'	4°6.955'	1	13.23	10.0	29	1.093	0.090	7	86.3	1.5	94.3	7.6
KF-04	38°44.686'	6°9.178'	0.9	13.35	10.0	26	1.072	0.140	5	63.7	1.5	68.3	9.1
KF-05	39°45.382'	7°45.43'	0.7	13.21	5.0	16	1.038	0.190	4	59.6	1.8	61.9	11.0
KF-06	38°56.577'	4°5.76'	1.2	13.24	5.9	20	1.090	0.100	5	96.6	2.4	105.3	9.7
KF-07	39°18.598'	3°41.309'	1.1	13.17	5.9	19	1.130	0.100	5	79.1	2.9	89.4	8.7
KF-08	38°24.624'	2°39.285'	0.7	13.33	5.9	19	1.095	0.070	5	84.6	2.6	92.7	6.8
KF-09	38°27.367'	2°35.989'	1.8	13.33	5.9	16	1.117	0.190	5	90.3	4.6	100.8	18.0
KF-10	37°52.797'	2°20.882'	0.9	13.34	5.9	21	1.049	0.080	5	91	2.0	95.4	7.7
KF-11	37°49.108'	2°23.578'	0.7	13.34	5.9	19	1.043	0.140	5	84.7	2.2	88.3	12.0
KF-12	37°41.737'	2°14.234'	1.4	13.34	5.9	20	0.953	0.050	4	87.4	2.2	83.3	5.1
KF-13	37°41.360'	2°14.744'	1.2	13.33	5.9	20	1.045	0.050	5	78.5	1.8	82.0	4.4
KF-14	37°41.107'	2°14.926'	1.4	13.34	5.9	19	1.066	0.070	5	122.3	1.5	130.3	8.1
KF-15	37°50.512'	2°18.79'	2	13.33	5.9	19	1.087	0.090	5	113.9	2.9	123.9	11.0
KF-16	38°17.486'	2°0.599'	1.5	13.13	10.0	39	1.134	0.110	6	18.8	0.6	21.3	2.1
KF-17	38°19.299'	2°4.468'	1.7	13.14	9.8	37	1.119	0.090	7	131.1	2.2	146.7	12.0
KF-18	37°57.160'	2°9.733'	1.2	13.33	10.0	38	1.072	0.140	7	152.1	2.6	163.1	21.0
GF-19	38°35.84'	3°12.996'	5.7	13.32	5.9	0	1.100	0.150	5	72.6	2.2	79.9	11.0
KF-20	40°25.854'	3°29.943'	0.9	13.23	5.9	17	1.217	0.100	5	1.9	0.8	2.3	1.0
KF-21	41°35.15'	4°54.490'	6.2	13.28	9.2	25	1.232	0.080	7	46.5	0.8	57.3	3.8
KF-22	41°45.963'	4°59.973'	4.8	13.27	10.0	30	1.212	0.130	7	43.3	1.2	52.5	5.6
KF-23	42°18.785'	3°55.513'	1.1	13.13	5.9	13	1.212	0.150	5	36.8	0.6	44.6	5.7
KF-24	41°49.724'	5°5.742'	1.2	13.25	5.9	15	1.180	0.120	5	44.8	0.6	52.9	5.3
KF-25	41°36.978'	5°12.559'	1.3	13.26	5.9	15	1.259	0.100	5	121.8	0.8	153.4	12.0
KF-26	41°23.939'	5°23.800'	1.4	13.29	5.9	15	1.162	0.060	5	111.5	0.9	129.6	7.0
KF-27	41°20.700'	5°29.103'	1.4	13.3	5.9	15	1.129	0.110	5	44.3	0.9	50.0	5.0
KF-28	41°12.503'	5°36.234'	1.3	13.31	5.9	14	1.180	0.130	5	45.5	1.2	53.7	6.0