熊本,阿蘇およびくじゅう地域の地下水および河川水の化学・同位体組成

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Chemical and isotopic compositions of groundwaters and river waters in Kumamoto, Aso and Kuju area, southwest Japan

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熊本県熊本,阿蘇地域および大分県くじゅう地域を含む北緯 32.5°～33.3°,東経 130.3°～131.7°の範囲において,温泉水などの深井戸,水道水用の浅井戸など坑井から得られる地下水や湧出地点の特定されている湧水を含む地下水試料および河川水試料の採取を行った.採取した試料数は,地下水試料 322 試料および河川水試料 268 試料である.なお,同一地点で異なる時期に採取した試料もそれぞれ1試料として数えている.試料採取地点を図1に示した.

各試料は,現地で水温,pH の測定を行った.水温の測定は湧出部や井戸吐出部,河川に直接センサーを水没させ実施したが,これが難しい場合は採取した水試料にセンサーを水没させ速やかに測定した.pH の測定は採取した水試料にセンサーを水没させ実施し,機器表示値の安定を確認してから測定値とした.測定に用いた機器は以下の通り.

水温: -ebro®TFX410 (分解能:0.1℃)

pH: HORIBA 社製 LAQUA act D-74(分解能:0.01pH)

各試料はイオンクロマトグラフ分析を行う前に,アドバンテック東洋社製 DISMIC® 0.2 μm PTFE フィルターで濾過を行った.Thermo Fisher Scientific 社製イオンクロマトグラフ ICS-

2100 および Integrion RFIC により，陽イオン Na^+, K^+, Mg^{2+}, Ca^{2+}, Li^+および NH_4^+の 6 成分，および陰イオン Cl^-, SO_4^{2-}, F^-, NO_3^-, NO_2^-, PO_4^{3-}および Br^-の 7 成分の分析を行った．陽イオン分析用の溶離液は 20 mmol のメタンスルホン酸溶液，陰イオン分析用の溶離液は水酸化カリウム溶液で，1–30 mmol に変化させるグラディエント分析である．

陰イオンのうち，HCO_3^-および CO_3^{2-}の値は，pH 4.8 アルカリ度および pH 8.3 アルカリ度から変換した．アルカリ度は，京都電子社製自動滴定装置 AT-510 を用いて測定した．ここで示した HCO_3^-および CO_3^{2-}は，水試料の塩濃度の違いによる炭酸種の存在比の変化を考慮していない．そこで，塩濃度をパラメータに加えて計算した炭酸種の存在比と後述の溶存無機炭素（DIC）濃度を用いて，塩濃度を考慮した HCO_3^-および CO_3^{2-}を求め，別に示した（表 1 中の HCO_3^-*および CO_3^{2-}*）．炭酸種の存在比に対する塩濃度の影響評価は，Millero et al.（2007）に従って行った．ただし，Millero et al.（2007）では，NaCl 濃度がパラメータとして用いられているが，本報で報告する水試料には，NaCl 以外にも濃度が高い成分があるため，陽イオンと陰イオンの全量をパラメータとした計算を行った．塩濃度の高い水試料においては，HCO_3^-*および CO_3^{2-}*を用いることを推奨する．

水試料の水素同位体比（δD）は，キャビティリングダウン分光法を用いる Picarro 社製水同位体比アナライザーL2120-i および L2130-i を用いて測定を行い，測定誤差は±0.6‰である．ただし，KYU_13_A024, KYU_13_A025, KYU_13_F013 および KYU_13_F015 については，800℃の金属クロム反応炉を用いた水-水素自動還元（H-device）法を前処理とする質量分析法により測定した．用いた測定機器は Thermo Fisher Scientific 社製 Delta V Advantage で，分析誤差は±1‰である．また，酸素同位体比（$\delta^{18}O$）は二酸化炭素-水自動平衡法を前処理とする質量分析法により測定した．用いた測定機器は Thermo Fisher Scientific 社製 Delta plus で，分析誤差は±0.1‰である．

水試料の I 濃度は，誘導結合プラズマ質量分析法（Agilent Technologies 社製 ICP-MS, Agilent 7700x）を用いて測定した．試料は，アドバンテック東洋社製 DISMIC® 0.2 μm または 0.45 μm PTFE フィルターで濾過を行った後，0.5%Tetramethyl ammonium hydroxide（TMAH）溶液で適切な濃度に希釈して測定に供した．一部の試料では，TMAH溶液と混合することで沈殿が生じたため，測定前にアドバンテック東洋社製 DISMIC® 0.2 μm PTFE フィルターまたは Merck 社製Amicon® Ultra 遠心式フィルター（3K）を用いて濾過を行った．測定の内標準元素にはReを用いた．なお，I濃度の分析は2017年以降に行った．

水試料の DIC 濃度と炭素同位体比（$\delta^{13}C$）は，連続フロー型の軽元素質量分析計を用いて測定した（Takahashi et al., 2019）．用いた分析機器は Thermo Fisher Scientific 社製 Delta-V Advantage と GasBench II で，DIC 濃度の分析誤差は 2%，$\delta^{13}C$ の分析誤差は±0.04‰である．

希ガス分析用の水試料は，焼きなました銅管（外径 3/8 インチ，長さ 30 cm）に採取した．希ガス濃度と He 同位体比は，希ガス質量分析計 MM5400（Micromass 社製）を用いて測定した．空気平衡水（ASW）の繰り返し分析から，$^3He/^4He$ と希ガス存在度の再現性は約 3%である（n

= 10, 1 σ）. 溶存希ガスの抽出と精製方法を含む分析操作の詳細は, Morikawa et al. (2008) に記述されている. 表中で, corrected $^{3}He/^{4}He$ (Ra)は, 次式により大気成分の寄与を取り除いた除いた値を示す.

corrected $^{3}He/^{4}He$ (Ra) = $[(^{3}He/^{4}He)_{sam} - r]/(1-r)$

$R = (^{4}He/^{20}Ne)_{ASW}/(^{4}He/^{20}Ne)_{sam}$

ここで, $(^{3}He/^{4}He)_{sam}$, $(^{4}He/^{20}Ne)_{sam}$ は分析値, $(^{4}He/^{20}Ne)_{ASW}$ は大気成分（Air Saturated water）の $^{4}He/^{20}Ne$ 比（ここでは 0.266 で計算）を示す. なお, 大気成分の寄与が大きい試料（$^{4}He/^{20}Ne$ < 1 の試料）については corrected 値の誤差が大きくなるため記載していない. また, Ra は大気中の $^{3}He/^{4}He$ 値で規格化した値（1 Ra = 1.4×10^{-6}）を意味する.

分析結果を表1に示した. 表1には Sample ID, 試料採取日, Category（地下水(G)および河川水(R)の別）および試料採取地点の緯度経度を同時に示した.

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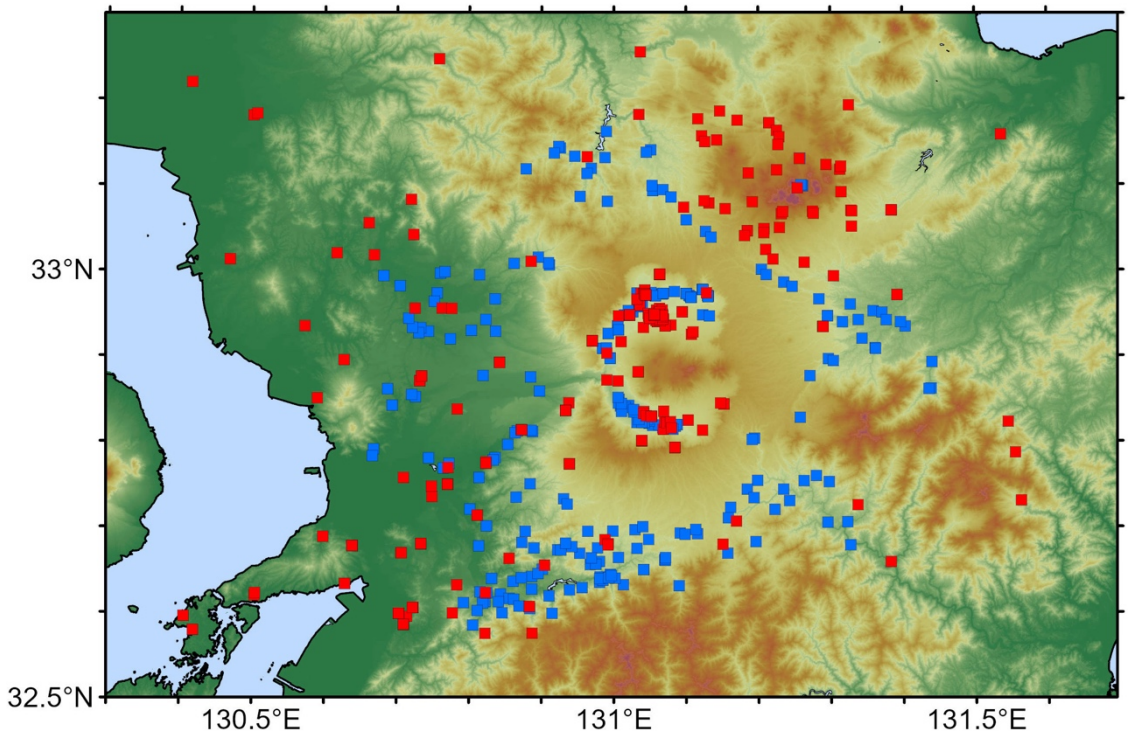

図 1：熊本，阿蘇およびくじゅう地域の地下水および河川水の試料採取地点
地下水：赤　河川水：青

表1：熊本，阿蘇およびくじゅう地域の地下水および河川水の化学・同位体組成．
*：水試料の塩濃度をパラメータに加えて計算した HCO_3^-および CO_3^{2-}の濃度
#: 水温，pH，Na^+，K^+，Mg^{2+}，Ca^{2+}，NH_4^+，Cl^-，SO_4^{2-}，HCO_3^-，NO_3^-，NO_2^-，および水の水素・酸素同位体比は Sato et al. (2020)による．
$: 水温，pH，$Na^+$，$K^+$，$Mg^{2+}$，$Ca^{2+}$，$Cl^-$，$SO_4^{2-}$，$HCO_3^-$，および NO_3^-は Kawabata et al. (2020)による．

Sample_ID	Sample_Date	Category	latitude	longitude	Temperature	pH	Na^+	K^+	Mg^{2+}	Ca^{2+}	Li^+	NH_4^+
			(°)	(°)	(°C)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_13_A024	2013/10/28	G	32.66	131.38	33.4	8.5	212	1.45	0.49	2.46	0.16	0.41
KYU_13_A025	2013/10/28	G	32.73	131.34	20.9	7.3	15.3	0.92	8.45	25.8	0.02	0.04
KYU_13_F013	2013/12/17	G	32.67	130.71	31.0	8.9	93.6	0.25	0.15	5.05	0.05	0.03
KYU_13_F015	2013/12/18	G	32.58	130.42	41.8	6.8	1870	38.0	39.0	44.5	2.64	3.59
KYU_14_A001	2014/10/26	G	32.62	130.50	20.5	5.8	25.5	4.22	19.4	63.0	0.01	0.04
KYU_14_E001	2014/11/16	G	32.73	131.56	27.8	8.7	71.9	0.52	0.03	5.50	0.05	0.00
KYU_14_E003	2014/11/17	G	32.82	131.55	15.8	7.9	3.11	0.69	1.78	21.1	0.00	0.00
KYU_14_E004	2014/11/17	G	32.79	131.56	15.4	8.3	87.7	0.69	0.52	7.94	0.08	0.00
KYU_14_E005	2014/11/18	G	33.07	131.38	47.8	6.6	425	84.9	312	233	0.56	1.46
KYU_14_E006	2014/11/18	G	33.07	131.38	29.9	6.8	169	30.4	114	79.7	0.24	0.00
KYU_14_E007	2014/11/18	G	33.07	131.38	45.4	6.6	376	73.9	269	191	0.51	1.15
KYU_14_E008	2014/11/18	G	32.93	131.29	33.9	6.3	357	5.74	64.0	121	0.64	0.38
KYU_14_E009	2014/11/18	G	32.97	131.39	40.1	8.4	431	5.83	0.13	35.1	0.57	0.01
KYU_14_E010	2014/11/19	G	33.19	131.33	51.6	8.8	150	1.64	0.01	3.67	0.19	0.00
KYU_14_E012	2014/11/19	G	33.26	131.04	96.8	8.9	377	29.0	0.17	1.92	1.00	0.40
KYU_14_E018	2014/11/21	G	33.13	130.96	33.3	8.7	85.5	0.52	0.16	238	0.02	0.01
KYU_14_E019	2014/11/21	G	32.99	131.30		8.3	239	1.00	0.53	5.83	0.04	0.07
KYU_14_E020	2014/11/21	G	33.01	131.26		7.9	391	24.6	26.1	29.0	0.23	0.22
KYU_14_F002	2014/11/17	G	33.08	131.13	69.5	6.8	253	61.7	28.5	45.1	0.79	0.05
KYU_14_F003	2014/11/17	G	33.16	131.12	96.7	8.2	854	107	0.14	20.4	3.95	0.27
KYU_14_F004	2014/11/17	G	32.97	131.04	43.2	7.4	273	30.5	87.0	135	0.19	2.05
KYU_14_F005	2014/11/17	G	32.94	131.07	58.0	6.9	466	49.5	111	83.3	0.53	0.36
KYU_14_F006	2014/11/17	G	33.18	131.03	98.7	8.4	584	25.3	0.19	40.3	1.17	0.30
KYU_14_F007	2014/11/18	G	32.80	131.04	39.6	7.4	339	7.17	12.5	16.4	0.40	0.19
KYU_14_F008	2014/11/18	G	33.01	130.89	45.3	8.8	98.1	0.88	0.50	2.39	0.03	0.00
KYU_14_F009	2014/11/18	G	32.96	130.72	53.2	8.6	271	2.62	0.03	0.82	0.29	0.36
KYU_14_F010	2014/11/18	G	32.87	130.73	48.8	8.1	185	9.67	0.68	5.52	0.26	0.27
KYU_14_F011	2014/11/18	G	32.88	130.73	61.1	7.5	323	11.0	3.19	17.2	0.67	0.72
KYU_14_F012	2014/11/18	G	32.85	130.59	39.5	8.1	77.2	15.7	1.79	8.07	0.02	0.00
KYU_14_F013	2014/11/19	G	32.89	130.84	45.3	7.9	414	6.30	10.1	27.5	0.16	0.71
KYU_14_F014	2014/11/19	G	33.06	130.66	48.3	9.5	78.6	0.43	0.02	0.71	0.03	0.06
KYU_14_F015	2014/11/19	G	32.94	130.57	43.6	8.3	529	0.78	2.85	13.4	0.14	0.01
KYU_14_F016	2014/11/19	G	33.01	130.47	30.9	9.8	69.9	0.33	0.01	0.71	0.02	0.00
KYU_14_F017	2014/11/19	G	32.87	130.99	40.4	7.4	212	35.5	96.2	117	0.18	0.00
KYU_14_F018	2014/11/20	G	32.68	130.99	23.3	8.6	31.3	1.94	2.21	7.27	0.01	0.00
KYU_14_F019	2014/11/20	G	32.61	130.88	29.2	9.3	32.2	0.23	0.02	3.64	0.02	0.04
KYU_15_E009	2015/12/14	G	33.18	130.50	32.6	6.8	552	41.3	395	370	2.98	1.08
KYU_15_E010	2015/12/14	G	33.18	130.51	19.4	5.7	70.5	5.10	49.5	36.7	0.03	0.14
KYU_15_E012	2015/12/15	G	33.25	130.76	30.9	9.2	32.0	0.67	0.07	3.20	0.04	0.09
KYU_15_E017	2015/12/16	G	33.22	130.42	11.9	7.8	345	20.5	8.72	10.2	0.18	26.6
KYU_16_A001	2016/03/06	G	32.60	130.78	13.9	7.9	5.46	0.43	4.40	18.8	0.00	0.00
KYU_16_A002#	2016/03/06	G	32.59	130.71	17.7	7.4	12.1	0.63	4.02	23.9	0.01	0.00
KYU_16_A003#	2016/03/06	G	32.61	130.72	17.0	7.9	7.46	1.48	8.70	39.3	0.00	0.00
KYU_16_A004	2016/03/06	G	32.63	130.78	16.0	7.5	4.05	0.55	3.10	68.3	0.00	0.00
KYU_16_A005	2016/03/06	G	32.58	130.82	14.9	7.9	14.7	0.68	1.75	14.6	0.02	0.00
KYU_16_A006	2016/03/06	G	32.58	130.89	11.6	8.0	3.26	0.26	1.56	9.97	0.00	0.00
KYU_16_A007	2016/03/07	R	32.62	130.82	13.5	8.4	6.47	1.40	3.55	17.9	0.00	0.01
KYU_16_A008	2016/03/07	R	32.61	130.82	13.1	8.2	6.14	0.99	4.56	27.2	0.00	0.03
KYU_16_A009	2016/03/07	R	32.61	130.82	13.9	8.5	5.84	1.02	3.98	22.5	0.00	0.01
KYU_16_A010	2016/03/07	R	32.60	130.81	15.4	8.9	5.65	0.88	3.83	21.8	0.00	0.01
KYU_16_A011	2016/03/07	R	32.61	130.79	17.0	7.9	7.43	1.83	4.27	23.0	0.00	0.00
KYU_16_A012	2016/03/07	R	32.59	130.81	15.8	8.5	4.82	0.69	3.64	16.5	0.00	0.01
KYU_16_A013	2016/03/07	R	32.62	130.82	15.2	8.3	5.80	1.65	3.25	15.2	0.00	0.01
KYU_16_A014	2016/03/07	R	32.62	130.84	21.9	8.1	9.67	4.78	4.35	20.3	0.00	0.02
KYU_16_A015	2016/03/07	R	32.62	130.86	18.1	8.0	5.00	0.79	2.81	12.4	0.00	0.01
KYU_16_A016	2016/03/07	R	32.62	130.86	17.2	8.5	4.75	0.69	2.78	12.1	0.00	0.02
KYU_16_A017	2016/03/07	R	32.61	130.88	12.9	8.2	3.48	0.42	2.70	11.8	0.00	0.00
KYU_16_A018	2016/03/08	R	32.63	130.96	11.5	8.5	3.68	0.46	2.32	21.3	0.00	0.00
KYU_16_A019	2016/03/08	R	32.63	130.94	12.0	8.1	3.31	0.36	3.16	13.1	0.00	0.00
KYU_16_A020	2016/03/08	R	32.60	130.91	11.9	8.1	3.07	0.41	1.58	9.23	0.00	0.01
KYU_16_A021	2016/03/08	R	32.62	130.91	13.7	8.1	3.57	0.44	1.87	10.5	0.00	0.00
KYU_16_A022	2016/03/08	R	32.61	130.87	12.4	8.0	4.26	0.40	3.98	10.4	0.00	0.00
KYU_16_A023	2016/03/08	R	32.60	130.85	12.2	8.0	3.61	0.36	2.87	11.8	0.00	0.00
KYU_16_A024	2016/03/08	R	32.61	130.84	14.1	7.8	3.82	0.45	2.89	15.2	0.00	0.01
KYU_16_A025	2016/03/08	R	32.64	130.83	17.0	7.8	5.81	1.31	5.34	31.8	0.00	0.00
KYU_16_A026	2016/03/08	R	32.64	130.86	16.5	7.7	8.50	2.22	4.77	25.2	0.00	0.00
KYU_16_A027	2016/03/08	R	32.63	130.89	15.4	7.9	5.58	1.49	1.81	12.1	0.00	0.01
KYU_16_A028	2016/03/09	G	33.05	131.18	13.3	7.8	5.17	2.57	1.97	7.95	0.00	0.00
KYU_16_A029	2016/03/09	G	33.05	131.21	13.9	7.3	6.59	2.67	3.65	11.1	0.01	0.00
KYU_16_A030	2016/03/09	G	33.02	131.21	14.0	7.2	6.14	4.19	2.22	7.63	0.00	0.00

Sample_ID	Sample_Date	Category	latitude	longitude	Temperature	pH	Na^+	K^+	Mg^{2+}	Ca^{2+}	Li^+	NH_4^+
			(°)	(°)	(°C)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_16_A031	2016/03/10	G	33.08	130.72	14.8	7.9	3.11	0.17	4.53	9.21	0.00	0.00
KYU_16_A032	2016/03/10	G	33.04	130.72	17.5	8.0	4.56	0.32	6.38	17.0	0.00	0.00
KYU_16_A033	2016/03/10	G	33.02	130.67	18.3	6.4	11.2	7.17	5.76	14.0	0.00	0.00
KYU_16_A034	2016/03/10	G	33.02	130.62	16.6	6.7	10.1	6.13	4.04	11.2	0.00	0.00
KYU_16_A035	2016/03/10	G	32.90	130.63	16.8	7.0	6.32	2.36	7.14	14.2	0.00	0.00
KYU_16_A036	2016/03/10	G	32.96	130.76	18.2	7.1	10.1	4.66	6.13	16.8	0.00	0.00
KYU_16_A037	2016/03/10	G	32.96	130.78	18.0	7.0	11.2	4.30	4.71	13.0	0.00	0.00
KYU_16_B001	2016/03/06	G	32.66	130.86	16.5	7.5	4.11	0.50	1.94	62.5	0.00	0.00
KYU_16_B002	2016/03/06	G	32.66	130.90	16.6	7.2	10.3	5.31	4.69	31.8	0.00	0.00
KYU_16_B003	2016/03/06	G	32.69	130.99	16.8	6.9	7.16	3.71	3.68	10.3	0.00	0.00
KYU_16_B004#	2016/03/06	G	32.75	130.77	18.7	7.0	12.9	4.93	8.95	17.2	0.00	0.00
KYU_16_B005	2016/03/07	R	32.64	130.98	10.6	7.7	3.55	0.61	6.83	27.9	0.00	0.00
KYU_16_B006	2016/03/07	R	32.64	130.98	12.8	8.1	7.98	3.13	3.33	17.1	0.00	0.01
KYU_16_B007	2016/03/07	R	32.64	130.98	11.8	7.9	4.09	0.92	2.04	13.2	0.00	0.00
KYU_16_B008	2016/03/07	R	32.65	131.00	13.0	7.7	4.96	1.81	3.14	9.25	0.00	0.00
KYU_16_B009	2016/03/07	R	32.64	130.99	12.5	7.6	6.71	0.41	1.89	17.4	0.01	0.01
KYU_16_B010	2016/03/07	R	32.63	131.09	12.0	8.3	3.08	0.52	1.74	8.01	0.00	0.00
KYU_16_B011	2016/03/07	R	32.66	131.07	12.8	8.5	3.47	0.82	2.30	7.93	0.00	0.00
KYU_16_B012	2016/03/07	R	32.65	131.04	12.5	7.7	2.73	0.33	4.72	9.28	0.00	0.00
KYU_16_B013	2016/03/07	R	32.63	131.01	11.8	7.5	2.85	0.31	3.39	8.72	0.00	0.00
KYU_16_B014	2016/03/07	R	32.64	131.00	12.0	7.8	3.19	0.35	3.52	9.17	0.00	0.00
KYU_16_B015	2016/03/08	R	32.70	130.88	13.2	7.7	4.24	0.87	2.36	12.8	0.00	0.00
KYU_16_B016	2016/03/08	R	32.68	130.87	13.4	7.6	5.36	1.33	2.89	13.6	0.00	0.01
KYU_16_B017	2016/03/08	R	32.68	130.89	13.1	7.7	5.39	1.52	2.90	14.3	0.00	0.00
KYU_16_B018	2016/03/08	R	32.67	130.92	12.5	8.3	3.68	0.89	4.04	17.2	0.00	0.00
KYU_16_B019	2016/03/08	R	32.65	130.90	13.6	7.7	5.40	1.77	3.39	24.4	0.00	0.00
KYU_16_B020	2016/03/08	R	32.64	130.89	14.8	8.3	5.79	1.86	3.60	24.3	0.00	0.00
KYU_16_B021	2016/03/08	R	32.67	130.95	16.9	7.8	5.90	1.28	2.63	21.6	0.00	0.00
KYU_16_B022	2016/03/08	R	32.68	130.94	12.6	8.0	5.89	1.89	3.48	23.9	0.00	0.00
KYU_16_B023	2016/03/08	R	32.67	130.93	14.3	7.8	4.73	1.42	2.83	18.1	0.00	0.00
KYU_16_B024	2016/03/08	R	32.68	130.93	16.8	8.3	4.64	1.31	2.77	16.5	0.00	0.00
KYU_16_B025	2016/03/08	R	32.70	130.96	17.2	7.9	6.94	3.94	3.10	10.5	0.00	0.00
KYU_16_B026	2016/03/08	R	32.68	130.98	17.2	7.9	10.9	3.68	3.52	13.5	0.00	0.00
KYU_16_B027	2016/03/08	R	32.66	130.97	15.5	8.2	6.76	2.17	3.28	19.6	0.00	0.00
KYU_16_B028	2016/03/09	G	32.71	131.17	14.7	7.7	6.59	3.64	2.90	8.74	0.00	0.00
KYU_16_B029	2016/03/09	G	32.68	131.15	14.0	7.2	6.02	2.97	2.22	6.63	0.00	0.00
KYU_16_B030	2016/03/10	G	32.77	130.77	18.6	7.1	12.9	4.86	9.51	17.7	0.00	0.00
KYU_16_B031#	2016/03/10	G	32.68	130.73	18.0	6.7	12.3	9.04	5.43	15.5	0.00	0.00
KYU_16_B032#	2016/03/10	G	32.77	130.94	13.7	6.9	4.64	1.95	2.59	6.87	0.00	0.00
KYU_16_B033#	2016/03/10	G	32.81	130.87	16.9	6.8	5.90	2.98	4.09	9.50	0.00	0.00
KYU_16_B034#	2016/03/10	G	32.84	130.93	15.2	7.5	4.68	2.03	2.28	7.58	0.00	0.00
KYU_16_B035	2016/03/10	G	32.85	130.94	15.0	7.4	4.62	2.14	2.15	6.79	0.00	0.00
KYU_16_J001$	2016/04/23	G	32.68	130.64	16.4	8.5	6.53	2.22	3.42	10.6	0.00	0.00
KYU_16_J002	2016/04/23	G	32.67	130.71	31.0	9.0	85.8	0.30	0.14	4.68	0.06	0.00
KYU_16_J005	2016/04/23	G	32.69	130.60	24.2	9.2	27.6	0.15	0.79	6.34	0.00	0.00
KYU_16_J006	2016/04/24	G	32.89	130.84	46.7	7.8	386	6.23	11.2	31.2	0.18	0.54
KYU_16_J007#	2016/04/24	G	32.84	130.93	15.3	8.3	4.64	1.98	2.23	7.51	0.00	0.00
KYU_16_J008	2016/04/24	G	32.74	130.75	39.9	7.4	3660	7.37	52.5	377	1.85	0.96
KYU_16_J009#	2016/04/24	G	32.75	130.77	18.7	7.8	12.9	4.89	9.04	17.4	0.00	0.00
KYU_16_J010	2016/04/25	G	32.60	130.70	36.9	7.5	1970	21.5	47.1	226	0.62	1.11
KYU_16_J011	2016/04/25	G	32.60	130.70	23.6	7.2	1060	8.83	906	2250	0.01	0.00
KYU_16_J012#	2016/04/25	G	32.61	130.72	17.4	7.9	7.45	1.40	7.77	34.5	0.00	0.00
KYU_16_J013	2016/04/25	G	32.62	130.82	35.4	9.5	107	0.39	0.03	2.06	0.06	0.02
KYU_16_J014#	2016/04/25	G	32.68	130.73	18.1	7.4	11.8	8.74	5.19	15.0	0.00	0.00
KYU_16_J015	2016/04/25	G	32.76	130.71	22.9	8.2	57.3	6.22	5.43	7.11	0.00	0.36
KYU_16_J016	2016/04/25	G	32.87	130.73	50.4	8.1	198	10.9	1.07	7.37	0.30	0.09
KYU_16_J017	2016/04/25	G	32.88	130.73	62.2	7.6	323	11.7	3.64	18.9	0.72	0.66
KYU_16_J018	2016/05/12	G	32.63	130.63	33.4	6.9	2590	12.5	495	2260	0.44	2.40
KYU_16_J019	2016/05/12	G	32.62	130.50	18.8	5.8	28.8	3.25	39.0	88.5	0.10	0.31
KYU_16_J020	2016/05/12	G	32.60	130.41	44.6	6.8	3090	93.0	143	257	5.43	7.23
KYU_16_J021	2016/05/12	G	32.60	130.41	32.7	7.8	230	5.22	2.62	6.14	0.36	0.49
KYU_16_J022$	2016/05/12	G	32.68	130.64	16.4	7.8	6.43	2.22	3.43	10.6	0.00	0.00
KYU_16_J023#	2016/05/12	G	32.61	130.72	17.4	7.3	7.45	1.35	7.67	33.8	0.00	0.00
KYU_16_J024#	2016/05/12	G	32.59	130.71	18.2	6.7	11.5	0.64	3.99	23.8	0.01	0.00
KYU_16_J025	2016/05/13	G	32.71	130.81	39.8	8.6	161	0.83	0.11	2.82	0.18	0.07
KYU_16_J026#	2016/05/13	G	32.75	130.77	18.7	7.7	12.4	4.90	8.79	17.1	0.00	0.00
KYU_16_J027#	2016/05/13	G	32.81	130.87	17.1	7.9	5.87	2.90	3.79	9.07	0.00	0.00
KYU_16_J028#	2016/05/13	G	32.84	130.93	15.4	7.8	4.59	2.00	2.25	7.68	0.00	0.00
KYU_16_J029	2016/05/14	G	32.80	131.04	37.6	7.3	339	7.30	12.9	17.8	0.41	0.23
KYU_16_J030#	2016/05/14	G	32.83	131.05	15.2	7.1	10.2	4.45	5.35	16.8	0.00	0.00

Sample_ID	Sample_Date	Category	latitude	longitude	Temperature	pH	Na^+	K^+	Mg^{2+}	Ca^{2+}	Li^+	NH_4^+
			(°)	(°)	(°C)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_16_J031	2016/05/14	G	32.84	131.15	41.3	8.8	84.9	0.56	0.41	2.34	0.02	0.20
KYU_16_J032	2016/05/14	G	32.95	131.09	14.3	7.9	15.8	4.96	10.7	29.3	0.00	0.00
KYU_16_J033#	2016/05/15	G	32.77	130.94	13.9	8.1	4.65	1.95	2.62	7.02	0.00	0.00
KYU_16_J034	2016/05/15	G	32.68	130.99	30.4	9.5	39.5	0.19	0.02	1.88	0.03	0.02
KYU_16_J035	2016/05/15	G	32.61	130.88	29.3	9.1	29.9	0.26	0.04	5.37	0.02	0.04
KYU_16_J039$	2016/05/31	G	32.96	131.04	23.6	6.7	138	19.7	83.8	167	0.11	6.33
KYU_16_J040	2016/05/31	G	32.97	131.03	38.1	6.9	311	47.1	162	196	0.30	4.28
KYU_16_J041#	2016/05/31	G	32.95	131.09	14.3	7.5	15.6	4.84	10.5	28.3	0.00	0.00
KYU_16_J042	2016/06/01	G	32.97	131.04	36.8	7.7	131	5.23	5.98	24.0	0.07	0.81
KYU_16_J043	2016/06/01	G	32.97	131.04	32.7	7.4	101	15.2	34.3	47.1	0.09	0.68
KYU_16_J044	2016/06/01	R	32.96	131.04	18.2	7.1	68.3	11.8	50.5	99.1	0.05	0.22
KYU_16_J045	2016/06/01	G	32.95	131.01	15.4	7.3	3.70	2.40	1.47	5.73	0.00	0.00
KYU_16_J046	2016/06/01	G	32.92	130.97	15.1	7.7	3.61	1.27	1.62	4.31	0.00	0.00
KYU_16_J047#	2016/06/01	G	32.84	130.93	15.3	7.5	4.43	1.98	2.19	7.46	0.00	0.00
KYU_16_J048#	2016/06/01	G	32.81	130.87	17.1	6.9	5.85	2.88	3.82	9.08	0.00	0.00
KYU_16_J049#	2016/06/01	G	32.75	130.77	18.9	7.1	12.3	4.75	8.88	16.7	0.00	0.00
KYU_16_J050#	2016/09/26	G	32.81	130.87	17.1	8.7	5.94	2.97	3.80	9.51	0.00	0.00
KYU_16_J051#	2016/09/26	G	32.84	130.93	15.4	8.4	4.56	1.96	1.89	7.51	0.00	0.00
KYU_16_J052#	2016/09/26	G	32.77	130.94	13.9	8.0	4.48	1.88	2.31	6.89	0.00	0.00
KYU_16_J053#	2016/09/26	G	32.75	130.77	18.7	7.5	12.6	4.85	9.49	16.9	0.00	0.00
KYU_16_J054#	2016/09/26	G	32.61	130.72	17.4	8.2	7.28	1.30	7.93	33.9	0.00	0.00
KYU_16_J055#	2016/09/26	G	32.59	130.71	19.1	7.7	11.6	0.59	3.98	24.7	0.01	0.00
KYU_16_J056$	2016/09/26	G	32.68	130.64	16.5	7.7	6.34	2.20	3.19	10.4	0.00	0.00
KYU_16_J057#	2016/09/26	G	32.68	130.73	19.8	7.3	12.0	8.76	5.29	14.5	0.00	0.00
KYU_16_J058$	2016/09/27	G	32.96	131.04	23.9	7.1	154	20.5	104	178	0.08	6.44
KYU_16_J059	2016/09/27	G	32.93	131.11	47.4	7.1	245	16.7	44.7	75.9	0.80	0.43
KYU_16_J060$	2016/09/27	G	32.95	131.02	16.7	7.1	60.1	11.0	78.0	117	0.04	0.05
KYU_16_J061	2016/09/27	G	32.95	131.02	16.9	6.7	60.9	10.7	67.6	101	0.04	0.25
KYU_16_J062	2016/09/27	G	32.92	131.01	46.5	6.9	643	60.4	228	206	0.44	0.00
KYU_16_J063	2016/09/27	G	32.93	131.11	19.0	7.6	62.5	8.11	32.5	34.8	0.04	0.00
KYU_16_J064	2016/09/27	G	32.97	131.03	38.0	6.9	319	46.8	190	193	0.23	2.36
KYU_16_J065	2016/09/28	G	32.84	131.15	39.9	8.8	85.0	0.51	0.28	1.96	0.02	0.15
KYU_16_J066	2016/09/28	G	32.85	131.15	37.1	8.4	131	1.17	0.18	2.38	0.02	0.15
KYU_16_J067#	2016/09/28	G	32.83	131.05	15.1	8.0	9.57	4.36	5.88	16.0	0.00	0.00
KYU_16_J068	2016/09/28	G	32.84	131.07	52.2	7.3	317	14.4	7.65	13.3	0.18	0.68
KYU_16_J069	2016/09/28	G	32.80	131.04	30.5	7.3	339	7.07	13.3	15.7	0.38	0.17
KYU_16_J070	2016/09/28	G	32.87	131.01	49.9	7.3	182	34.9	24.1	25.3	0.13	0.60
KYU_16_J071	2016/09/29	G	32.97	131.04	45.8	7.2	332	41.1	108	125	0.17	2.96
KYU_16_J072	2016/09/29	G	32.98	131.04	43.9	7.5	149	22.5	29.2	30.3	0.14	0.97
KYU_16_J073	2016/09/29	G	32.98	131.04	37.5	7.2	191	23.8	67.6	60.5	0.00	12.2
KYU_16_J074	2016/09/29	G	32.97	131.04	45.0	7.0	300	34.2	90.5	128	0.20	1.95
KYU_16_J075#	2016/09/29	G	32.95	131.09	14.3	8.0	14.3	4.66	10.2	26.1	0.00	0.00
KYU_16_J076	2016/09/29	G	32.94	131.08	54.7	7.2	420	61.3	106	86.3	0.50	0.21
KYU_16_J077	2016/09/29	G	32.97	131.13	50.5	8.1	226	2.71	0.52	4.36	0.08	0.00
KYU_16_J078	2016/09/30	G	33.01	131.22	46.8	7.2	167	22.7	49.3	41.5	0.12	0.18
KYU_16_J079	2016/09/30	G	33.04	131.18	45.8	7.6	218	6.72	17.8	16.2	0.04	0.00
KYU_16_J080	2016/09/30	G	33.05	131.18	13.4	8.1	4.91	2.48	1.78	7.44	0.00	0.00
KYU_16_J081	2016/09/30	G	33.04	131.21	14.1	7.9	6.40	2.55	3.57	11.0	0.00	0.00
KYU_16_K001	2016/09/26	R	32.95	131.12	16.8	8.1	12.2	7.53	12.6	27.3	0.00	0.00
KYU_16_K002	2016/09/26	R	32.95	131.13	19.8	7.8	7.89	5.18	6.40	16.2	0.00	0.00
KYU_16_K003	2016/09/26	R	32.97	131.13	21.3	8.0	10.6	5.72	7.67	14.8	0.00	0.00
KYU_16_K004	2016/09/26	R	32.97	131.13	23.0	8.0	10.1	6.07	8.85	19.3	0.00	0.00
KYU_16_K005	2016/09/26	R	32.97	131.13	21.4	8.0	13.3	7.11	11.3	24.9	0.00	0.00
KYU_16_K006	2016/09/26	R	32.98	131.12	16.5	7.7	6.03	3.57	3.22	8.34	0.00	0.00
KYU_16_K007	2016/09/26	R	32.98	131.12	18.8	7.3	8.60	4.77	5.65	12.7	0.00	0.00
KYU_16_K008	2016/09/27	R	32.96	131.04	19.4	7.5	52.7	11.1	49.3	93.2	0.02	0.05
KYU_16_K009	2016/09/27	R	32.96	131.04	19.3	7.4	21.0	7.19	20.0	39.8	0.01	0.00
KYU_16_K010	2016/09/27	R	32.96	131.04	20.3	7.2	53.4	11.1	49.9	94.6	0.02	0.00
KYU_16_K011	2016/09/27	R	32.96	131.03	19.7	7.4	24.2	6.80	19.5	38.7	0.01	0.00
KYU_16_K012	2016/09/27	R	32.97	131.11	24.0	9.0	12.2	6.10	11.0	25.6	0.00	0.00
KYU_16_K013	2016/09/27	R	32.97	131.10	19.5	8.0	9.32	4.78	6.25	14.5	0.00	0.00
KYU_16_K014	2016/09/27	R	32.97	131.10	18.9	7.8	12.3	5.23	10.4	25.1	0.00	0.00
KYU_16_K015	2016/09/27	R	32.97	131.11	19.5	7.8	12.8	5.70	11.5	26.2	0.00	0.00
KYU_16_K016	2016/09/27	R	32.98	131.08	20.4	7.8	13.0	5.62	10.8	24.1	0.00	0.00
KYU_16_K017	2016/09/27	R	32.97	131.07	20.1	7.5	16.2	6.32	13.2	29.1	0.00	0.00
KYU_16_K018	2016/09/27	R	32.97	131.07	20.7	7.6	10.6	5.05	7.87	17.8	0.00	0.00
KYU_16_K019	2016/09/27	R	32.97	131.06	23.5	7.5	30.2	9.53	32.6	63.4	0.01	0.00
KYU_16_K020	2016/09/28	R	32.97	131.05	17.6	7.7	10.6	5.34	8.48	18.4	0.00	0.00
KYU_16_K021	2016/09/28	R	32.97	131.03	18.7	7.7	7.09	2.84	2.90	7.27	0.00	0.00
KYU_16_K022	2016/09/28	R	32.95	131.03	19.3	7.6	36.9	6.59	13.7	24.0	0.02	0.00

Sample_ID	Sample_Date	Category	latitude	longitude	Temperature	pH	Na^+	K^+	Mg^{2+}	Ca^{2+}	Li^+	NH_4^+
			(°)	(°)	(°C)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_16_K023	2016/09/28	R	32.95	131.02	18.6	7.5	19.7	6.41	16.1	30.4	0.01	0.00
KYU_16_K024	2016/09/28	R	32.97	131.03	18.4	7.6	14.2	5.66	10.7	21.5	0.00	0.00
KYU_16_K025	2016/09/28	R	32.95	131.02	18.8	7.4	19.6	6.37	15.8	29.9	0.01	0.00
KYU_16_K026	2016/09/28	R	32.94	131.01	19.0	7.6	20.2	6.37	16.3	30.4	0.01	0.00
KYU_16_K027	2016/09/28	R	32.93	131.01	17.9	7.5	9.34	3.22	5.29	13.2	0.00	0.00
KYU_16_K028	2016/09/28	R	32.93	130.99	19.1	7.4	19.9	6.21	16.1	29.6	0.01	0.00
KYU_16_K029	2016/09/28	R	32.91	130.98	19.0	7.4	19.9	6.17	15.7	28.8	0.01	0.00
KYU_16_K030	2016/09/28	R	32.91	130.99	19.7	7.4	6.39	3.61	3.95	9.90	0.00	0.00
KYU_16_K031	2016/09/28	R	32.90	130.99	17.1	7.4	13.1	4.55	6.85	13.1	0.02	0.00
KYU_16_K032	2016/09/29	G	32.82	131.08	15.7	7.2	9.21	5.04	7.30	21.8	0.00	0.00
KYU_16_K033	2016/09/29	G	32.81	131.07	14.8	6.8	5.51	2.94	3.81	8.62	0.00	0.00
KYU_16_K034	2016/09/29	G	32.84	131.04	16.2	6.7	11.0	6.05	6.34	16.7	0.00	0.00
KYU_16_K035	2016/09/29	G	32.83	131.04	16.5	6.2	11.8	6.06	6.77	18.6	0.00	0.00
KYU_16_K036	2016/09/29	G	32.83	131.04	16.1	6.3	11.1	5.75	6.20	18.4	0.00	0.00
KYU_16_K037	2016/09/29	G	32.81	131.12	14.3	7.4	6.21	3.29	5.90	13.5	0.00	0.00
KYU_16_K038	2016/09/30	G	32.82	131.07	15.7	6.5	14.6	4.75	11.2	35.7	0.00	0.00
KYU_16_K039	2016/09/30	G	32.82	131.07	14.9	6.7	11.8	4.34	8.84	28.4	0.00	0.00
KYU_16_K040	2016/09/30	G	32.82	131.08	15.2	6.7	10.4	4.66	7.70	25.1	0.00	0.00
KYU_16_K041	2016/09/30	G	32.83	131.10	16.4	6.7	9.10	6.37	6.75	24.5	0.00	0.00
KYU_16_K042	2016/09/30	R	32.82	131.03	19.8	7.7	3.08	1.22	1.16	5.58	0.00	0.00
ASO_16_K018	2016/10/25	G	32.94	131.07	16.5	5.8	30.1	7.31	25.3	50.4	0.00	0.00
ASO_16_K019	2016/10/25	G	32.95	131.07	18.1	5.7	80.4	12.6	86.3	166	0.01	0.00
ASO_16_K020	2016/10/25	G	32.95	131.07	17.1	6.6	50.7	11.0	57.0	115	0.01	0.00
KYU_16_J082#	2016/11/27	G	32.59	130.71	18.7	7.0	11.3	0.57	3.26	23.6	0.01	0.00
KYU_16_J083#	2016/11/27	G	32.61	130.72	17.4	7.4	7.18	1.30	7.63	34.3	0.00	0.00
KYU_16_J084$	2016/11/27	G	32.68	130.64	16.4	7.4	6.24	2.15	2.78	10.1	0.00	0.00
KYU_16_J085#	2016/11/27	G	32.75	130.77	18.7	7.0	12.5	4.79	9.34	16.7	0.00	0.00
KYU_16_J086#	2016/11/28	G	32.81	130.87	17.0	7.3	5.86	2.92	3.71	9.23	0.00	0.00
KYU_16_J087#	2016/11/28	G	32.84	130.93	15.3	7.5	4.55	1.95	1.88	7.55	0.00	0.00
KYU_16_J088#	2016/11/28	G	32.77	130.94	13.9	7.3	4.45	1.87	2.22	6.74	0.00	0.00
KYU_16_J089$	2016/11/28	G	32.96	131.04	23.9	6.6	155	20.7	105	177	0.08	6.43
KYU_16_J090$	2016/11/28	G	32.95	131.02	16.7	6.6	59.0	11.0	82.0	120	0.04	0.16
KYU_16_L007	2016/11/29	R	32.97	131.13	10.8	7.1	11.2	6.30	11.4	19.3	0.00	0.00
KYU_16_L008	2016/11/29	R	32.98	131.12	12.4	7.3	7.26	4.05	4.93	10.1	0.00	0.00
KYU_16_L009	2016/11/29	R	32.97	131.10	12.3	7.4	10.6	5.20	9.78	19.2	0.00	0.00
KYU_16_L010	2016/11/29	R	32.97	131.07	12.2	7.6	11.1	5.20	9.91	19.5	0.00	0.00
KYU_16_L011	2016/11/29	R	32.97	131.05	12.4	7.5	11.9	5.35	10.9	20.6	0.00	0.00
KYU_16_L012	2016/11/29	R	32.97	131.03	13.4	7.3	15.0	5.60	12.4	22.5	0.00	0.00
KYU_16_L013	2016/11/29	R	32.96	131.04	14.0	7.2	23.2	6.71	21.1	36.4	0.01	0.00
KYU_16_L014	2016/11/29	R	32.95	131.02	14.1	7.1	20.4	6.41	18.7	30.9	0.01	0.00
KYU_16_L015	2016/11/29	R	32.95	131.01	14.2	7.2	20.7	6.42	18.9	30.8	0.01	0.00
KYU_16_L016	2016/11/29	R	32.94	131.01	14.1	6.8	21.5	6.48	15.5	31.9	0.01	0.00
KYU_16_L017	2016/11/29	R	32.93	130.99	14.1	7.1	21.3	6.38	15.4	31.4	0.01	0.00
KYU_16_L018	2016/11/29	R	32.91	130.98	13.7	7.1	21.7	6.53	15.3	31.3	0.01	0.00
KYU_16_L019	2016/11/30	R	32.90	130.99	13.8	7.3	13.8	4.57	6.37	13.4	0.02	0.00
KYU_16_L020	2016/11/30	R	32.91	130.99	13.5	7.0	7.76	3.85	4.32	11.3	0.00	0.00
KYU_16_L021	2016/11/30	R	32.93	131.01	11.4	7.1	8.37	3.00	4.20	11.8	0.00	0.00
KYU_16_L022	2016/11/30	R	32.95	131.03	14.2	7.1	53.9	8.13	15.7	29.1	0.02	0.00
KYU_16_L023	2016/11/30	R	32.95	131.02	14.5	7.3	16.1	4.59	8.99	17.8	0.01	0.00
KYU_16_L024	2016/11/30	R	32.96	131.04	12.7	7.0	22.4	7.47	20.4	44.1	0.01	0.09
KYU_16_L025	2016/11/30	R	32.96	131.04	14.4	6.8	51.9	11.0	49.1	92.0	0.02	0.00
KYU_16_L026	2016/11/30	R	32.97	131.03	13.2	7.4	8.86	2.94	3.01	7.39	0.00	0.00
KYU_16_L027	2016/11/30	R	32.97	131.06	16.2	7.2	41.9	10.6	32.1	68.4	0.00	0.00
KYU_16_L028	2016/11/30	R	32.97	131.07	14.3	7.3	15.4	6.03	12.4	28.4	0.00	0.00
KYU_16_L029	2016/11/30	R	32.97	131.10	14.9	7.1	12.3	5.30	10.4	25.0	0.00	0.00
KYU_16_L030	2016/11/30	R	32.97	131.11	14.5	7.2	12.9	5.75	11.8	26.7	0.00	0.00
KYU_16_L031	2016/11/30	R	32.97	131.11	16.6	7.1	12.6	5.53	10.7	27.1	0.00	0.00
KYU_16_L032	2016/11/30	R	32.98	131.12	14.1	7.5	5.98	3.56	2.83	8.09	0.00	0.00
KYU_16_L033	2016/11/30	R	32.97	131.13	14.7	7.3	11.0	5.91	8.33	16.8	0.00	0.00
KYU_16_L034	2016/11/30	R	32.97	131.13	15.1	7.4	13.6	7.23	12.4	28.4	0.00	0.00
KYU_16_L035	2016/12/01	G	32.78	130.82	17.7	7.4	8.08	4.46	5.49	10.8	0.00	0.00
KYU_16_K043	2016/11/29	R	32.82	131.08	12.3	7.9	9.91	4.64	6.89	24.6	0.00	0.00
KYU_16_K044	2016/11/29	R	32.82	131.07	13.2	8.1	8.88	4.45	6.48	20.4	0.00	0.00
KYU_16_K045	2016/11/29	R	32.82	131.05	13.3	7.6	9.96	4.50	6.85	22.0	0.00	0.00
KYU_16_K046	2016/11/29	R	32.83	131.03	13.4	7.6	10.1	4.47	6.49	20.5	0.00	0.00
KYU_16_K047	2016/11/29	R	32.84	131.03	13.6	7.7	10.2	4.47	6.81	20.2	0.00	0.00
KYU_16_K048	2016/11/29	R	32.84	131.02	14.4	7.8	14.3	4.98	7.86	20.7	0.00	0.00
KYU_16_K049	2016/11/29	R	32.84	131.01	14.3	7.5	13.2	4.75	7.44	19.6	0.00	0.00
KYU_16_K050	2016/11/29	R	32.85	131.01	15.0	8.0	13.9	4.88	7.78	19.3	0.00	0.00
KYU_16_K051	2016/11/30	R	32.83	131.10	15.2	7.8	9.28	5.75	6.67	24.6	0.00	0.00

Sample_ID	Sample_Date	Category	latitude	longitude	Temperature	pH	Na^+	K^+	Mg^{2+}	Ca^{2+}	Li^+	NH_4^+
			(°)	(°)	(°C)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_16_K052	2016/11/30	R	32.82	131.09	14.3	7.8	9.66	4.50	6.52	21.1	0.00	0.00
KYU_16_K053	2016/11/30	R	32.82	131.09	13.5	7.8	10.4	4.90	7.79	29.7	0.00	0.00
KYU_16_K054	2016/11/30	R	32.81	131.08	13.7	7.9	6.08	3.42	4.78	11.7	0.00	0.00
KYU_16_K055	2016/11/30	G	32.82	131.08	15.7	7.0	8.96	4.95	7.30	19.8	0.00	0.00
KYU_16_K056	2016/11/30	R	32.82	131.05	15.0	7.4	9.04	4.44	6.98	20.1	0.00	0.00
KYU_16_K057	2016/11/30	R	32.82	131.06	15.5	7.5	12.5	4.82	10.2	29.1	0.00	0.00
KYU_16_K058	2016/11/30	R	32.82	131.05	15.6	7.3	21.0	5.68	8.98	26.1	0.00	0.00
KYU_16_K059	2016/11/30	R	32.83	131.05	14.8	7.0	10.3	4.66	5.98	17.7	0.00	0.00
KYU_16_K060	2016/11/30	R	32.82	131.04	15.2	7.6	7.26	3.73	4.62	11.5	0.00	0.00
KYU_16_K061	2016/12/01	R	32.82	131.04	14.9	7.7	6.57	3.51	4.49	13.0	0.00	0.00
KYU_16_K062	2016/12/01	R	32.83	131.03	14.5	7.8	7.68	3.99	5.89	15.9	0.00	0.00
KYU_16_K063	2016/12/01	R	32.83	131.03	14.5	7.8	9.63	4.36	5.92	18.9	0.00	0.00
KYU_16_K064	2016/12/01	R	32.84	131.02	14.5	7.9	7.72	3.87	4.88	15.4	0.00	0.00
KYU_16_K065	2016/12/01	R	32.84	131.01	14.3	7.8	6.06	2.66	3.32	13.0	0.00	0.00
KYU_16_K066	2016/12/01	R	32.85	131.01	14.4	7.9	6.92	3.54	4.24	14.3	0.00	0.00
KYU_16_K067	2016/12/01	R	32.84	131.03	16.2	7.5	25.4	6.64	10.5	21.0	0.01	0.00
KYU_16_K068	2016/12/01	R	32.85	131.01	18.3	7.3	24.9	7.32	15.6	23.7	0.01	0.00
KYU_16_K069	2016/12/01	R	32.85	131.01	13.5	7.2	9.99	4.82	5.75	16.8	0.00	0.00
ASO_16_K025	2016/11/29	G	32.94	131.07	16.4	6.6	30.1	7.31	25.2	50.2	0.00	0.00
ASO_16_K027	2016/11/30	G	32.95	131.07	18.1	5.7	80.1	12.5	85.9	166	0.01	0.00
ASO_16_K028	2016/12/02	G	32.95	131.05	15.5	5.9	29.0	6.87	22.2	39.8	0.00	0.00
ASO_16_K029	2016/12/02	G	32.95	131.06	13.7	6.6	10.3	5.13	8.51	20.1	0.00	0.00
ASO_16_K030	2016/12/02	G	32.94	131.06	15.4	5.6	18.2	5.58	14.2	28.5	0.00	0.00
ASO_16_K031	2016/12/02	G	32.94	131.06	16.8	6.6	11.5	7.73	7.33	20.9	0.00	0.00
ASO_16_K032	2016/12/02	G	32.94	131.07	14.7	6.4	26.4	7.89	19.4	33.0	0.00	0.00
ASO_17_K001	2017/01/24	G	32.95	131.06	26.9	6.8	272	17.9	119	198	0.17	0.32
ASO_17_K002	2017/01/24	G	32.96	131.06	22.8	7.0	164	12.8	103	178	0.14	1.01
ASO_17_K003	2017/01/24	G	32.95	131.07	15.7	7.1	54.2	5.67	39.7	92.1	0.04	0.63
ASO_17_K004	2017/01/24	G	32.95	131.07	18.3	6.0	84.2	12.9	90.7	174	0.01	0.00
ASO_17_K005	2017/01/24	G	32.95	131.07	17.8	5.8	113	12.0	138	279	0.01	0.00
ASO_17_K006	2017/01/24	G	32.94	131.06	16.7	6.7	11.9	7.73	7.41	20.4	0.00	0.00
ASO_17_K007	2017/01/25	G	32.95	131.06	17.0	6.4	85.9	12.8	59.4	121	0.08	0.00
ASO_17_K008	2017/01/25	G	32.94	131.06	18.4	6.4	139	22.2	151	349	0.05	0.02
ASO_17_K009	2017/01/25	G	32.94	131.06	18.4	6.0	91.2	15.0	80.4	189	0.02	0.03
ASO_17_K010	2017/01/25	G	32.95	131.05	12.1	5.4	63.0	12.0	58.6	122	0.02	0.00
ASO_17_K012	2017/01/26	G	32.95	131.06	17.2	6.3	48.8	9.80	38.7	94.1	0.05	0.00
ASO_17_K013	2017/01/26	G	32.95	131.06	20.7	6.4	208	40.4	174	338	0.14	1.37
ASO_17_K014	2017/01/26	G	32.95	131.05	16.0	6.3	29.7	7.04	22.8	40.6	0.00	0.00
ASO_17_K015	2017/01/26	G	32.94	131.05	13.9	6.7	32.9	5.19	25.7	41.1	0.00	0.00
ASO_17_K016	2017/01/26	G	32.94	131.06	17.0	5.7	42.4	11.5	40.8	84.5	0.02	0.00
ASO_17_K017	2017/01/31	G	33.00	131.06	11.4	6.7	3.41	0.99	1.47	5.12	0.00	0.00
ASO_17_K018	2017/01/31	G	32.95	131.06	21.5	6.5	206	39.8	172	335	0.14	1.34
ASO_17_K019	2017/01/31	G	32.92	130.97	10.5	7.0	3.76	1.05	1.68	4.45	0.00	0.00
ASO_17_K020	2017/01/31	G	32.97	131.04	45.8	7.2	318	47.5	120	147	0.36	2.67
ASO_17_K021	2017/02/01	G	32.93	131.29	34.1	6.5	360	5.31	57.9	16.5	0.71	0.48
ASO_17_K022	2017/02/01	G	32.79	131.08	13.5	8.6	2.77	0.99	0.91	3.93	0.00	0.00
KYU_17_J091$	2017/03/23	G	32.95	131.02	16.8	6.9	57.8	11.3	67.2	122	0.06	0.15
KYU_17_J092$	2017/03/23	G	32.96	131.04	24.0	6.8	149	21.0	89.1	170	0.14	6.03
KYU_17_J093#	2017/03/24	G	32.81	130.87	17.2	7.3	5.88	3.02	3.93	9.08	0.00	0.00
KYU_17_J094#	2017/03/24	G	32.84	130.93	15.4	8.1	4.55	2.07	2.28	7.64	0.00	0.00
KYU_17_J095#	2017/03/24	G	32.77	130.94	14.0	7.9	4.51	2.00	2.66	6.92	0.00	0.00
KYU_17_J096#	2017/03/24	G	32.75	130.77	18.8	7.3	12.4	4.89	8.71	16.6	0.00	0.00
KYU_17_J097$	2017/03/24	G	32.68	130.64	16.4	7.9	6.29	2.28	3.35	10.2	0.00	0.00
KYU_17_J098#	2017/03/24	G	32.59	130.71	17.9	7.3	11.5	0.65	4.09	24.5	0.01	0.00
KYU_17_J099#	2017/03/24	G	32.61	130.72	16.9	7.8	6.95	1.50	8.36	37.9	0.00	0.00
KYU_17_J100#	2017/03/25	G	32.83	131.05	15.2	6.9	9.89	4.55	5.34	16.8	0.00	0.00
KYU_17_J101#	2017/03/25	G	32.95	131.09	14.3	7.3	13.6	4.62	9.37	25.4	0.00	0.00
ASO_17_K023	2017/04/12	G	33.00	131.06	12.0	7.5	3.18	0.96	1.32	4.76	0.00	0.00
ASO_17_K024	2017/04/12	G	32.95	131.06	20.5	6.8	208	40.2	174	339	0.14	1.42
ASO_17_K025	2017/04/12	G	32.97	131.04	43.5	7.4	318	47.4	120	156	0.36	0.00
ASO_17_K026	2017/04/12	G	32.92	130.97	13.7	8.0	3.68	1.17	1.66	4.50	0.00	0.00
ASO_17_K027	2017/04/13	G	32.93	131.29	36.6	6.6	361	4.83	53.8	26.8	0.65	0.42
ASO_17_K028	2017/04/13	G	32.79	131.08	12.9	7.5	2.72	1.11	0.82	3.44	0.00	0.00
KYU_17_T001	2017/03/07	G	32.60	130.71			25.7	3.19	16.0	41.3	0.00	0.00
ASO_17_K029	2017/07/11	G	32.93	131.29	36.9	6.4	371	4.96	58.7	41.9	0.68	0.53
ASO_17_K030	2017/07/11	G	32.97	131.04	44.5	7.0	326	49.0	127	165	0.36	2.68
ASO_17_K031	2017/07/11	G	32.92	130.97	15.8	7.9	3.83	1.18	1.79	4.76	0.00	0.00
ASO_17_K032	2017/07/12	G	33.00	131.06	15.1	6.7	3.15	0.98	1.33	4.79	0.00	0.00
ASO_17_K033	2017/07/13	G	32.79	131.08	12.8	6.8	2.72	0.99	1.05	4.30	0.00	0.00
ASO_17_K034	2017/07/13	G	32.95	131.06	20.8	6.7	197	38.3	162	317	0.13	1.29

Sample_ID	Sample_Date	Category	latitude	longitude	Temperature	pH	Na^+	K^+	Mg^{2+}	Ca^{2+}	Li^+	NH_4^+
			(°)	(°)	(°C)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_17_A003	2017/08/01	G	33.16	131.54	20.0	6.5	7810	340	335	338	31.9	28.8
KYU_17_A005	2017/08/01	G	32.97	131.39	39.8	8.4	413	5.56	0.04	33.5	0.57	0.15
KYU_17_A006	2017/08/01	G	33.07	131.15	62.3	6.9	324	78.0	41.7	57.3	0.94	0.75
KYU_17_A007	2017/08/01	G	33.08	131.13	55.1	6.8	210	50.5	26.5	40.4	0.63	0.00
KYU_17_A008	2017/08/01	G	33.07	131.10	43.8	6.7	142	34.4	24.3	32.7	0.46	0.00
KYU_17_A009	2017/08/02	G	32.78	130.82	17.8	7.6	8.03	4.18	5.69	11.0	0.00	0.00
KYU_17_A010#	2017/08/02	G	32.75	130.77	18.7	7.3	12.4	4.77	8.69	16.5	0.00	0.00
KYU_17_A011	2017/08/02	G	32.68	130.64	16.9	7.5	6.26	2.14	3.24	10.2	0.00	0.00
KYU_17_A012	2017/08/02	G	32.63	130.63	33.7	7.1	2530	9.51	474	2220	0.30	2.68
KYU_17_A013	2017/08/02	G	32.58	130.42	41.9	6.9	1890	37.8	32.8	40.9	2.60	3.16
KYU_17_A014	2017/08/02	G	32.89	130.84	46.0	7.7	410	6.13	10.3	27.6	0.16	0.76
KYU_17_A015	2017/08/03	G	32.87	130.73	51.0	7.9	205	10.7	0.80	6.87	0.30	0.00
KYU_17_A016	2017/08/03	G	32.88	130.73	61.6	7.6	322	11.0	3.19	17.3	0.69	0.62
KYU_17_A017	2017/08/03	G	32.75	130.75	38.1	7.4	3580	4.98	47.3	366	1.58	1.67
KYU_17_A018	2017/08/03	G	32.71	130.81	40.8	8.5	160	0.67	0.05	2.06	0.17	0.10
KYU_17_A019#	2017/08/03	G	32.59	130.71	19.0	7.4	11.6	0.59	3.86	23.8	0.01	0.00
KYU_17_A020	2017/08/03	G	32.60	130.70	37.1	7.2	2040	21.2	45.7	233	0.51	1.66
KYU_17_A021	2017/08/04	G	32.80	131.04	41.5	7.6	339	6.99	11.1	14.2	0.41	0.24
KYU_17_A022	2017/08/04	G	32.94	131.07	40.6	7.2	262	23.3	73.8	64.5	0.21	0.36
KYU_17_A023	2017/08/04	G	32.96	131.04	24.0	7.0	154	20.7	92.8	177	0.10	6.27
KYU_17_A024	2017/08/04	G	32.95	131.02	16.7	6.9	55.1	10.3	58.5	105	0.04	0.12
KYU_17_A025	2017/08/04	G	32.97	131.04	46.3	7.1	316	39.6	90.0	127	0.21	2.77
ASO_17_K035	2017/08/10	G	32.94	131.07	16.4	5.7	30.7	7.55	26.0	51.3	0.00	0.00
ASO_17_K036	2017/08/10	G	32.95	131.07	18.2	5.8	77.4	12.7	82.9	161	0.01	0.00
ASO_17_K037	2017/08/10	G	32.95	131.07	20.0	5.7	111	12.1	135	275	0.01	0.00
ASO_17_K039	2017/08/10	G	32.94	131.06	16.9	6.7	11.2	7.55	7.90	20.9	0.00	0.00
ASO_17_K040	2017/10/31	G	33.00	131.06	12.8	6.8	3.87	1.20	1.93	6.67	0.00	0.00
ASO_17_K041	2017/10/31	G	32.95	131.06	20.8	6.7	205	39.8	170	333	0.13	1.37
ASO_17_K042	2017/11/01	G	32.93	131.29	34.4	6.6	348	4.81	54.6	104	0.61	0.41
ASO_17_K043	2017/11/01	G	32.79	131.08	13.6	7.5	2.93	1.13	1.10	4.55	0.00	0.00
ASO_17_K044	2017/11/01	G	32.97	131.04	43.8	7.1	332	49.4	128	167	0.36	2.42
ASO_17_K045	2017/11/02	G	32.92	130.97	14.6	7.4	3.86	1.46	1.78	4.75	0.00	0.00
KYU_17_B001	2017/12/07	R	32.72	130.80	8.5	8.3	7.92	2.13	3.66	12.0	0.00	0.00
KYU_17_B002	2017/12/07	R	32.75	130.88	10.3	8.2	4.65	1.64	2.53	7.19	0.00	0.00
KYU_17_B003	2017/12/07	R	32.74	130.87	9.7	7.3	4.82	1.74	2.64	7.33	0.00	0.00
KYU_17_B004	2017/12/08	R	32.71	131.32	9.5	7.6	4.65	1.64	2.10	7.91	0.00	0.00
KYU_17_B005	2017/12/08	R	32.68	131.33	9.9	7.2	3.34	0.68	1.24	16.8	0.00	0.00
KYU_17_B006	2017/12/08	R	32.71	131.30	8.0	7.3	5.00	1.31	2.71	7.55	0.00	0.00
KYU_17_B007	2017/12/08	R	32.75	131.30	9.2	7.0	3.68	0.83	1.34	6.54	0.00	0.00
KYU_17_B008	2017/12/08	R	32.76	131.28	9.7	6.8	4.40	1.12	2.05	10.9	0.00	0.00
KYU_17_B009	2017/12/08	R	32.75	131.26	8.2	6.7	5.95	3.07	3.32	9.68	0.00	0.00
KYU_17_B010	2017/12/09	R	32.73	130.93	5.2	8.5	3.72	0.91	2.05	5.68	0.00	0.00
KYU_17_B011	2017/12/09	R	32.73	130.94	6.0	8.0	4.52	1.65	2.61	7.34	0.00	0.00
KYU_17_B012	2017/12/09	R	32.70	130.82	7.5	8.0	5.13	1.76	2.60	8.36	0.00	0.00
KYU_17_B013	2017/12/09	R	32.68	130.81	10.8	7.6	7.43	2.08	4.73	19.9	0.00	0.00
KYU_17_B014	2017/12/09	R	32.64	130.87	10.4	7.5	5.45	1.48	3.62	25.0	0.00	0.00
KYU_17_B015	2017/12/09	R	32.64	130.98	8.5	7.9	7.11	2.77	3.30	17.0	0.00	0.00
KYU_17_B016	2017/12/09	R	32.64	130.99	8.8	7.5	9.01	0.36	2.05	20.9	0.01	0.00
KYU_17_B017	2017/12/09	R	32.64	131.00	6.7	7.2	3.93	0.32	4.03	11.8	0.00	0.00
KYU_17_B018	2017/12/09	R	32.66	131.01	7.7	7.9	5.20	2.33	2.87	7.90	0.00	0.00
KYU_17_B019	2017/12/10	R	32.80	131.19	12.0	7.7	6.26	3.86	4.24	11.8	0.00	0.00
KYU_17_B020	2017/12/10	R	32.80	131.19	11.3	7.5	6.27	3.73	4.15	11.6	0.00	0.00
KYU_17_B021	2017/12/10	R	32.74	131.23	12.5	7.6	6.45	3.62	4.26	11.4	0.00	0.00
KYU_17_B022	2017/12/10	R	32.76	131.20	7.2	8.1	5.69	2.80	3.56	9.93	0.00	0.00
KYU_17_B023	2017/12/10	R	32.74	131.18	7.1	8.0	5.28	2.63	3.05	8.93	0.00	0.00
KYU_17_B024	2017/12/10	R	32.72	131.16	5.9	8.0	4.61	1.91	2.74	8.40	0.00	0.00
KYU_17_B025	2017/12/10	R	32.71	131.16	5.3	7.1	4.90	2.24	2.59	8.02	0.00	0.00
KYU_17_B026	2017/12/10	R	32.68	131.20	8.4	7.5	3.95	1.11	1.54	8.50	0.00	0.00
KYU_17_B027	2017/12/11	R	32.66	131.07	8.7	7.6	3.49	0.79	2.79	9.13	0.00	0.00
KYU_17_B028	2017/12/11	R	32.66	131.07	7.6	8.0	5.53	3.27	2.31	7.17	0.00	0.00
KYU_17_B029	2017/12/11	R	32.66	131.07	8.5	7.3	6.02	3.32	2.53	9.34	0.00	0.00
KYU_17_B030	2017/12/11	R	32.65	131.04	10.3	7.7	2.79	0.29	4.94	10.9	0.00	0.00
KYU_17_B031	2017/12/11	R	32.68	131.03	9.7	7.4	5.73	3.13	2.89	8.43	0.00	0.00
KYU_17_B032	2017/12/11	R	32.70	131.00	10.0	7.6	4.73	2.09	2.65	6.79	0.00	0.00
KYU_17_B033	2017/12/11	R	32.70	131.03	9.5	7.5	4.41	1.94	2.45	6.91	0.00	0.00
KYU_17_B034	2017/12/11	R	32.69	131.05	9.7	7.5	5.89	3.30	2.83	8.54	0.00	0.00
KYU_17_B035	2017/12/11	R	32.70	131.04	8.9	6.6	4.95	2.09	2.86	7.67	0.00	0.00
KYU_17_B036	2017/12/12	R	32.69	131.09	8.8	7.7	6.50	3.88	3.06	9.41	0.00	0.00
KYU_17_B037	2017/12/12	R	32.69	131.10	6.8	7.9	4.90	2.23	2.18	6.56	0.00	0.00
KYU_17_B038	2017/12/12	R	32.69	131.12	7.8	8.0	6.75	3.79	2.56	8.27	0.00	0.00

Sample_ID	Sample_Date	Category	latitude	longitude	Temperature	pH	Na^+	K^+	Mg^{2+}	Ca^{2+}	Li^+	NH_4^+
			(°)	(°)	(°C)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_17_B039	2017/12/12	R	32.70	131.11	6.8	7.3	5.07	2.48	2.79	8.22	0.00	0.00
KYU_17_B040	2017/12/12	R	32.67	131.16	6.7	7.9	3.34	0.78	1.65	9.93	0.00	0.00
KYU_17_B041	2017/12/13	R	32.83	131.26	7.4	7.5	4.90	2.85	2.21	6.70	0.00	0.00
KYU_17_B042	2017/12/13	R	32.73	131.24	7.3	7.9	3.71	1.05	3.96	9.11	0.00	0.00
KYU_17_B043	2017/12/13	R	32.72	131.22	7.2	7.7	3.41	0.60	3.65	6.52	0.00	0.00
KYU_17_B044	2017/12/13	R	32.73	131.19	3.4	7.5	5.27	2.61	3.11	9.09	0.00	0.00
KYU_17_B045	2017/12/13	R	32.66	130.98	7.7	7.7	8.58	3.59	3.41	13.6	0.00	0.00
KYU_17_B046	2017/12/13	R	32.66	130.98	8.9	7.3	6.24	1.92	3.27	21.5	0.00	0.00
KYU_17_B047	2017/12/13	R	32.66	130.97	6.6	7.4	6.44	2.18	3.30	15.6	0.00	0.00
KYU_17_B048	2017/12/14	R	32.88	130.82	8.7	7.1	21.3	6.30	13.2	27.6	0.01	0.00
KYU_17_B049	2017/12/14	R	32.65	130.90	9.2	7.7	5.34	1.52	3.48	24.4	0.00	0.00
KYU_17_C001	2017/12/10	R	33.08	130.99	7.1	8.3	4.19	1.04	1.94	11.0	0.00	0.00
KYU_17_C002	2017/12/10	R	33.09	131.05	6.9	8.1	4.21	2.28	1.93	5.43	0.00	0.00
KYU_17_C003	2017/12/10	R	33.10	131.05	6.6	7.8	6.43	2.01	2.21	24.2	0.00	0.00
KYU_17_C004	2017/12/10	R	33.09	131.07	11.6	8.0	4.26	2.12	2.26	5.98	0.00	0.00
KYU_17_C005	2017/12/10	R	33.09	131.08	12.2	7.8	4.83	2.71	2.56	6.63	0.00	0.00
KYU_17_C006	2017/12/11	R	33.13	130.99	8.1	8.0	3.69	1.21	1.92	5.72	0.00	0.00
KYU_17_C007	2017/12/11	R	33.16	130.99	8.8	7.9	3.74	1.59	0.90	3.43	0.00	0.00
KYU_17_C008	2017/12/11	R	33.12	130.97	7.3	7.9	4.17	1.11	1.81	8.96	0.00	0.00
KYU_17_C009	2017/12/11	R	33.11	130.96	7.6	8.2	3.15	0.84	1.16	4.78	0.00	0.00
KYU_17_C010	2017/12/11	R	33.09	130.95	7.6	8.0	3.08	0.91	0.98	4.18	0.00	0.00
KYU_17_C011	2017/12/11	R	33.13	130.95	6.8	8.0	3.76	0.95	1.87	11.0	0.00	0.00
KYU_17_C012	2017/12/11	R	33.14	130.93	7.0	7.9	4.45	1.18	1.73	6.17	0.00	0.00
KYU_17_C013	2017/12/11	R	33.15	130.92	7.3	7.7	3.87	0.67	2.46	17.8	0.00	0.00
KYU_17_C014	2017/12/11	R	33.14	130.92	7.0	7.8	3.52	1.09	1.51	7.92	0.00	0.00
KYU_17_C015	2017/12/11	R	33.12	130.88	8.0	7.4	3.26	0.94	1.11	4.40	0.00	0.00
KYU_17_C016	2017/12/11	R	33.14	131.05	9.0	7.8	5.57	2.64	2.30	8.88	0.00	0.00
KYU_17_C017	2017/12/11	R	33.14	131.04	7.5	7.9	4.73	2.33	1.82	6.14	0.00	0.00
KYU_17_C018	2017/12/12	R	33.06	131.10	12.1	7.9	4.90	2.87	2.52	6.58	0.00	0.00
KYU_17_C019	2017/12/12	R	33.05	131.13	2.8	7.7	4.38	2.07	2.11	6.20	0.00	0.00
KYU_17_C020	2017/12/12	R	33.04	131.13	6.5	8.0	4.02	2.41	2.41	5.84	0.00	0.00
KYU_17_C021	2017/12/12	R	33.00	131.20	6.2	7.8	5.91	4.15	2.66	7.93	0.00	0.00
KYU_17_C022	2017/12/12	R	33.00	131.21	3.4	8.0	5.82	3.46	2.72	9.29	0.00	0.00
KYU_17_C023	2017/12/12	R	32.99	131.24	5.8	8.0	5.80	3.52	2.49	6.85	0.00	0.00
KYU_17_C024	2017/12/12	R	32.98	131.25	8.2	7.9	6.56	3.90	3.94	11.2	0.00	0.00
KYU_17_C025	2017/12/12	R	32.97	131.28	7.0	7.9	7.59	4.81	5.31	14.9	0.00	0.00
KYU_17_C026	2017/12/12	R	32.96	131.33	7.6	7.9	8.87	4.72	7.36	19.3	0.00	0.00
KYU_17_C027	2017/12/12	R	32.95	131.36	9.7	8.0	8.85	4.39	6.19	16.4	0.00	0.00
KYU_17_C028	2017/12/12	R	32.95	131.37	8.9	7.9	7.90	4.14	5.66	15.7	0.00	0.00
KYU_17_C029	2017/12/12	R	32.94	131.38	11.5	8.0	7.25	4.18	5.49	14.3	0.00	0.00
KYU_17_C030	2017/12/12	R	32.93	131.40	7.8	8.2	7.45	3.32	3.90	10.7	0.00	0.00
KYU_17_C031	2017/12/13	R	32.92	131.34	9.9	7.9	6.77	4.12	5.24	14.2	0.00	0.00
KYU_17_C032	2017/12/13	R	32.90	131.30	8.5	8.0	5.93	3.41	4.05	11.6	0.00	0.00
KYU_17_C033	2017/12/13	R	32.89	131.30	8.2	8.1	5.84	3.22	3.82	10.7	0.00	0.00
KYU_17_C034	2017/12/13	R	32.88	131.27	9.7	8.2	5.55	2.91	3.17	8.91	0.00	0.00
KYU_17_C035	2017/12/13	R	32.91	131.36	8.2	7.9	6.24	2.87	3.63	10.5	0.00	0.00
KYU_17_C036	2017/12/13	R	32.91	131.36	7.4	8.1	4.52	1.46	2.51	8.16	0.00	0.00
KYU_17_C037	2017/12/13	R	32.89	131.44	6.2	7.7	3.16	0.61	1.64	7.81	0.00	0.00
KYU_17_C038	2017/12/13	R	32.86	131.44	5.7	7.6	3.09	0.50	1.76	9.77	0.00	0.00
KYU_17_C039	2017/12/13	R	32.86	131.44	5.2	7.6	3.15	0.49	1.28	4.30	0.00	0.00
KYU_17_C040	2017/12/14	R	32.94	131.40	10.2	7.7	7.10	3.41	4.80	12.8	0.00	0.00
KYU_17_C041	2017/12/14	R	32.94	131.34	8.6	8.0	7.41	3.90	5.90	16.5	0.00	0.00
KYU_17_C042	2017/12/14	R	32.94	131.32	7.9	8.2	8.16	4.36	6.62	18.0	0.00	0.00
KYU_17_C043	2017/12/14	R	32.95	131.30	6.5	8.3	8.16	4.28	6.23	16.2	0.00	0.00
KYU_17_C044	2017/12/14	R	32.95	131.30	8.7	8.2	7.50	4.27	6.34	17.2	0.00	0.00
KYU_17_D001	2017/12/10	R	32.86	130.90	11.5	8.1	5.25	2.53	2.73	8.94	0.00	0.00
KYU_17_D002	2017/12/10	R	32.93	130.84	12.1	8.0	5.05	2.49	2.91	9.27	0.00	0.00
KYU_17_D003	2017/12/11	R	32.81	130.89	12.6	8.1	4.61	2.18	2.31	6.36	0.00	0.00
KYU_17_D004	2017/12/11	R	32.81	130.89	11.2	8.0	4.31	1.62	2.73	8.11	0.00	0.00
KYU_17_D005	2017/12/11	R	32.81	130.87	13.5	8.0	12.8	5.83	4.26	9.10	0.00	0.00
KYU_17_D006	2017/12/11	R	32.81	130.86	11.1	7.9	4.56	1.99	2.51	7.13	0.00	0.00
KYU_17_D007	2017/12/11	R	32.80	130.85	9.7	8.2	5.00	1.24	4.72	9.41	0.00	0.00
KYU_17_D008	2017/12/11	R	32.78	130.84	8.2	8.1	5.17	1.63	7.65	7.61	0.00	0.00
KYU_17_D009	2017/12/11	R	32.78	130.83	9.3	8.0	7.79	1.24	3.93	10.3	0.00	0.00
KYU_17_D010	2017/12/11	R	32.76	130.81	8.7	8.1	9.42	0.95	3.46	12.2	0.00	0.00
KYU_17_D011	2017/12/12	R	33.01	130.91	12.5	8.1	4.42	1.62	2.53	6.08	0.00	0.00
KYU_17_D012	2017/12/12	R	33.01	130.91	8.8	8.1	3.60	1.31	1.54	4.92	0.00	0.00
KYU_17_D013	2017/12/12	R	33.02	130.90	9.9	7.4	4.70	1.64	1.97	6.36	0.00	0.00
KYU_17_D014	2017/12/12	R	33.01	130.86	13.4	7.4	5.97	2.94	2.65	7.60	0.00	0.00
KYU_17_D015	2017/12/12	R	33.00	130.81	10.0	8.0	4.81	1.68	1.85	7.12	0.00	0.00
KYU_17_D016	2017/12/12	R	32.94	130.82	12.6	7.8	5.61	1.98	3.12	9.38	0.00	0.00

Sample_ID	Sample_Date	Category	latitude	longitude	Temperature	pH	Na^+	K^+	Mg^{2+}	Ca^{2+}	Li^+	NH_4^+
			(°)	(°)	(°C)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_17_D017	2017/12/12	R	32.93	130.80	8.9	7.7	267	7.78	7.97	66.0	0.00	6.89
KYU_17_D018	2017/12/12	R	32.92	130.77	10.8	7.2	10.9	15.8	6.12	18.3	0.00	0.00
KYU_17_D019	2017/12/13	R	32.97	130.84	5.4	7.5	7.02	3.62	4.42	12.1	0.00	0.00
KYU_17_D020	2017/12/13	R	32.97	130.76	8.9	7.7	5.62	2.17	2.39	8.36	0.00	0.00
KYU_17_D021	2017/12/13	R	32.96	130.75	10.9	7.2	7.74	2.83	3.55	10.0	0.00	0.00
KYU_17_D022	2017/12/13	R	32.93	130.74	11.4	7.3	26.9	8.25	8.08	30.9	0.00	0.00
KYU_17_D023	2017/12/13	R	32.93	130.73	11.0	8.3	18.3	3.50	4.16	13.1	0.01	0.00
KYU_17_D024	2017/12/13	R	32.93	130.73	13.4	7.3	168	7.43	9.66	64.1	0.00	0.00
KYU_17_D025	2017/12/13	R	32.93	130.72	11.1	7.7	13.9	6.69	6.34	21.2	0.00	0.00
KYU_17_D026	2017/12/13	R	32.94	130.72	11.1	7.5	16.2	7.35	6.26	21.1	0.00	0.00
KYU_17_D027	2017/12/13	R	32.98	130.70	11.6	7.7	12.5	7.23	5.62	16.5	0.00	0.00
KYU_17_D028	2017/12/14	R	32.85	130.73	6.2	7.9	29.0	7.41	13.2	27.8	0.00	0.00
KYU_17_D029	2017/12/14	R	32.86	130.72	9.9	7.9	26.4	7.84	6.75	23.1	0.00	0.00
KYU_17_D030	2017/12/14	R	32.86	130.69	10.3	7.2	14.0	6.76	6.34	16.8	0.00	0.00
KYU_17_D031	2017/12/14	R	32.84	130.69	9.6	7.1	10.2	5.14	4.50	13.3	0.00	0.00
KYU_17_D032	2017/12/14	R	32.79	130.67	9.0	7.2	15.3	6.22	5.66	18.8	0.00	0.00
KYU_17_D033	2017/12/14	R	32.78	130.67	13.6	7.5	36.9	7.95	8.84	26.2	0.01	0.00
KYU_17_D034	2017/12/14	R	32.78	130.74	18.8	7.3	12.5	4.75	8.75	18.4	0.00	0.00
KYU_17_D035	2017/12/14	R	32.77	130.77	15.5	6.8	15.7	3.63	6.27	15.5	0.00	0.00
KYU_17_D036	2017/12/14	R	32.77	130.76	14.2	6.7	14.2	3.22	6.18	14.9	0.00	0.00
KYU_17_D037	2017/12/15	R	32.99	130.68	10.3	7.4	12.6	7.51	5.70	17.7	0.00	0.00
KYU_17_D038	2017/12/15	R	33.00	130.76	7.4	7.8	5.43	1.92	1.87	7.39	0.00	0.00
KYU_17_D039	2017/12/15	R	33.00	130.77	9.9	7.3	11.0	2.20	2.71	12.6	0.00	0.00
KYU_17_D040	2017/12/15	R	32.88	130.89	10.8	8.0	21.5	6.07	13.2	27.4	0.01	0.00
KYU_17_E001#	2017/12/15	G	32.84	130.93	15.3	7.6	4.50	1.91	2.31	7.75	0.00	0.00
KYU_17_E002#	2017/12/15	G	32.81	130.87	16.9	7.5	5.91	2.91	4.04	9.43	0.00	0.00
KYU_17_E003	2017/12/15	G	32.84	130.78	11.4	7.4	7.41	0.55	2.15	5.59	0.00	0.00
KYU_17_E004	2017/12/15	G	32.78	130.82	17.6	7.1	7.79	4.34	5.70	11.1	0.00	0.00
KYU_17_E005#	2017/12/15	G	32.75	130.77	18.6	7.3	12.5	4.73	8.85	16.7	0.00	0.00
KYU_17_E006#	2017/12/15	G	32.59	130.71	18.1	6.8	11.8	0.53	4.21	25.5	0.00	0.00
KYU_17_E007$	2017/12/16	G	32.96	131.04	24.5	6.6	151	20.2	91.3	174	0.08	6.22
KYU_17_E008$	2017/12/16	G	32.95	131.02	16.6	6.6	56.3	10.6	65.5	122	0.04	0.14
ASO_18_K001	2018/01/30	G	32.92	130.97	6.8	8.1	3.78	1.04	1.73	4.64	0.00	0.00
ASO_18_K002	2018/01/30	G	33.00	131.06	8.3	8.0	3.39	0.93	1.46	5.00	0.00	0.00
ASO_18_K003	2018/01/31	G	32.79	131.08	11.7	7.9	2.87	1.13	0.95	4.17	0.00	0.00
ASO_18_K004	2018/01/31	G	32.93	131.29	30.7	6.6	351	5.24	63.5	116	0.70	0.56
ASO_18_K005	2018/02/01	G	32.95	131.06	20.5	6.8	207	40.2	172	332	0.14	1.35
ASO_18_K006	2018/02/01	G	32.97	131.04	43.1	7.0	332	49.9	128	166	0.36	2.86
ASO_18_K007	2018/05/09	G	33.00	131.06	12.8	7.8	2.80	0.92	1.16	4.24	0.00	0.00
ASO_18_K008	2018/05/09	G	32.97	131.04	42.8	7.1	305	44.5	113	144	0.36	2.73
ASO_18_K009	2018/05/09	G	32.92	130.97	14.3	8.0	3.57	1.18	1.65	4.51	0.00	0.00
ASO_18_K010	2018/05/10	G	32.79	131.08	12.2	7.8	2.29	0.89	0.79	3.20	0.00	0.02
ASO_18_K011	2018/05/10	G	32.93	131.29	30.7	6.7	360	5.53	59.3	114	0.67	0.43
KYU_18_A001	2018/07/09	G	32.90	130.99	47.8	7.2	403	73.2	219	247	0.27	0.17
KYU_18_A002	2018/07/09	G	32.93	131.04	58.9	7.3	586	60.1	124	182	0.44	1.75
KYU_18_A003$	2018/07/09	G	32.96	131.04	23.8	6.9	152	20.5	92.3	181	0.14	6.36
KYU_18_A004$	2018/07/09	G	32.95	131.02	16.5	6.6	55.9	10.7	64.9	127	0.07	0.15
KYU_18_A005	2018/07/11	G	32.88	131.03	59.0	5.9	18.5	14.8	10.5	23.0	0.01	4.76
KYU_18_A006	2018/07/11	G	32.88	131.03	95.7	7.3	19.5	1.67	0.07	2.62	0.01	21.0
KYU_18_A008#	2018/07/11	G	32.83	131.05	15.2	6.9	10.3	4.56	5.33	17.4	0.00	0.00
KYU_18_A012#	2018/07/12	G	32.95	131.09	14.0	7.7	13.0	4.41	8.96	25.2	0.00	0.00
KYU_18_A013#	2018/07/12	G	32.84	130.93	15.2	7.8	4.57	2.02	2.32	8.02	0.00	0.00
KYU_18_A014#	2018/07/12	G	32.81	130.87	17.0	7.5	5.99	3.00	4.01	9.53	0.00	0.00
KYU_18_A015#	2018/07/13	G	32.75	130.77	18.6	7.5	12.5	4.86	8.91	17.2	0.00	0.00
KYU_18_A016#	2018/07/13	G	32.61	130.72	17.0	7.5	7.19	1.36	8.14	40.8	0.00	0.00
KYU_18_A017#	2018/07/13	G	32.59	130.71	18.4	7.1	11.1	0.60	3.32	20.5	0.01	0.00
ASO_18_K012	2018/07/10	G	33.00	131.06	14.5	7.6	3.37	1.08	1.52	5.38	0.00	0.00
ASO_18_K013	2018/07/10	G	32.97	131.04	45.3	7.0	337	51.5	129	170	0.38	2.72
ASO_18_K014	2018/07/11	G	32.92	130.97	15.6	8.0	3.78	1.21	1.71	4.63	0.00	0.00
ASO_18_K015	2018/07/10	G	32.79	131.08	12.8	6.5	2.58	0.97	0.96	3.96	0.00	0.00
ASO_18_K016	2018/07/12	G	32.93	131.29	36.8	6.5	357	5.99	57.8	110	0.65	0.44
ASO_18_K017	2018/07/10	G	32.95	131.06	20.8	6.8	198	40.9	160	324	0.17	1.34
KYU_18_B001	2018/10/21	G	33.12	131.23	49.3	6.4	57.5	15.3	44.7	160	0.06	0.05
KYU_18_B002	2018/10/21	G	33.09	131.31	10.5	5.4	7.73	1.97	3.42	26.7	0.02	0.00
KYU_18_B003	2018/10/22	G	33.12	131.31	9.3	5.1	8.86	1.15	2.50	23.5	0.01	0.00
KYU_18_B004	2018/10/22	G	33.07	131.28	30.1	6.2	109	20.3	116	184	0.17	0.14
KYU_18_B005	2018/10/22	G	33.07	131.28	30.3	6.6	276	45.9	195	180	0.48	0.19
KYU_18_B006	2018/10/22	G	33.12	131.31	11.3	5.0	7.60	1.27	1.59	17.8	0.01	0.00
KYU_18_B007	2018/10/22	G	33.10	131.25	43.5	7.0	75.8	22.5	48.6	116	0.08	0.09
KYU_18_B008	2018/10/22	G	33.13	131.26	12.5	5.8	11.0	2.67	9.19	37.4	0.02	0.00

Sample_ID	Sample_Date	Category	latitude	longitude	Temperature	pH	Na^+	K^+	Mg^{2+}	Ca^{2+}	Li^+	NH_4^+
			(°)	(°)	(°C)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
ASO_18_K018	2018/10/29	G	33.00	131.06	13.4	8.3	3.86	1.23	1.80	6.27	0.00	0.00
ASO_18_K019	2018/10/29	G	32.79	131.08	13.5	7.7	3.18	1.32	1.27	5.27	0.00	0.00
ASO_18_K020	2018/10/29	G	32.92	130.97	13.1	7.8	3.78	1.20	1.74	4.73	0.00	0.00
ASO_18_K021	2018/10/30	G	32.95	131.06	20.6	6.8	203	41.0	168	338	0.15	1.42
ASO_18_K022	2018/10/30	G	32.97	131.04	43.9	7.1	326	48.8	125	163	0.36	0.00
ASO_18_K023	2018/10/30	G	32.93	131.29	36.0	6.5	352	6.07	62.9	117	0.71	0.46
KYU_19_A001	2019/09/16	G	33.07	131.33	53.8	7.0	406	64.0	288	111	0.89	0.00
KYU_19_A002	2019/09/16	G	33.07	131.33	36.4	6.4	366	65.2	216	191	0.81	0.29
KYU_19_A003	2019/09/16	G	33.05	131.33	40.3	6.6	312	35.5	190	156	0.40	2.30
KYU_19_A004	2019/09/17	G	33.18	131.17	45.4	7.6	46.8	12.1	8.33	17.0	0.07	0.00
KYU_19_A005	2019/09/17	G	33.17	131.22	47.9	6.8	381	11.4	77.6	72.6	0.69	0.05
KYU_19_A006	2019/09/17	G	33.17	131.22	53.0	7.2	354	5.65	17.2	29.1	0.35	0.00
KYU_19_A007	2019/09/17	G	33.18	131.12	94.7	8.1	875	72.3	0.00	47.0	3.87	0.32
KYU_19_A015	2019/09/19	R	33.10	131.26	108.0	6.6	4.89	1.38	2.44	11.3	0.00	0.00
KYU_19_A016	2019/09/19	R	33.10	131.26	14.2	6.1	15.8	4.07	9.67	32.8	0.02	0.01
KYU_19_A017	2019/09/19	R	33.10	131.26	13.1	6.6	12.4	3.23	7.47	25.8	0.01	0.00
KYU_19_A019	2019/09/20	G	33.11	131.19	55.0	6.8	284	46.9	0.43	4.65	1.74	0.76
KYU_19_A020	2019/09/20	G	33.16	131.23	46.6	6.3	286	70.1	113	169	0.74	0.46
KYU_19_A021	2019/09/20	G	33.19	131.15	76.1	7.2	204	25.9	0.56	8.80	0.85	0.00
KYU_19_A022	2019/09/20	G	33.07	131.23	23.1	5.6	48.2	8.98	41.3	402	0.02	0.06
KYU_19_A023	2019/09/20	G	33.07	131.23	13.1	6.7	2.94	1.83	0.75	3.10	0.00	0.00
KYU_19_A024	2019/09/20	G	33.05	131.23	15.4	6.3	9.60	3.44	4.59	31.7	0.00	0.00
KYU_19_C001	2019/11/11	G	33.12	131.29	12.5	6.0	9.07	2.54	7.13	31.7	0.01	0.00
KYU_19_C002	2019/11/12	R	33.13	131.26	10.2	7.3	16.7	4.00	10.5	36.5	0.02	0.00
KYU_19_C003	2019/11/12	G	33.16	131.23	48.6	6.4	293	72.4	111	186	0.72	0.46
KYU_19_C004	2019/11/12	G	33.15	131.23	57.8	6.7	330	88.4	129	209	0.78	0.45
KYU_19_C005	2019/11/12	G	33.15	131.14	75.0	6.7	625	80.6	0.38	17.7	2.96	0.31
KYU_19_C006	2019/11/12	G	33.08	131.19	34.5	7.3	46.0	6.40	22.1	38.0	0.02	0.00
KYU_19_C007	2019/11/12	G	33.15	131.13	45.1	8.0	17.9	6.61	0.71	8.41	0.01	0.00

Sample_ID	Cl^-	SO_4^{2-}	HCO_3^-	CO_3^{2-}	F^-	NO_3^-	NO_2^-	PO_4^{3-}	Br^-	I
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_13_A024	75.2	0.24	370	7.0	7.77	0.01			0.14	
KYU_13_A025	3.28	8.62	140	0.0	0.19	0.46	0.00		0.01	
KYU_13_F013	4.31	7.50	190	7.0	4.27	0.09			0.02	
KYU_13_F015	1900	8.89	1800	0.0	1.57	0.28			5.43	
KYU_14_A001	6.94	6.13	300	0.0	0.04	0.01	0.00	0.01	0.02	
KYU_14_E001	38.1	7.49	94	2.6	6.74	0.01	0.00	0.00	0.05	
KYU_14_E003	1.96	4.11	66	0.0	0.04	2.11	0.00	0.04	0.01	
KYU_14_E004	28.6	6.35	170	1.2	6.09	0.01	0.00	0.00	0.04	
KYU_14_E005	195	359	2400	0.0	0.51	0.04	0.00	0.06	0.26	0.034
KYU_14_E006	63.8	128	920	0.0	0.35	0.99	0.64	0.00	0.09	
KYU_14_E007	157	289	2100	0.0	0.46	0.13	0.08	0.04	0.21	0.027
KYU_14_E008	222	0.20	1100	0.0	0.97	0.04	0.00	0.00	0.49	0.047
KYU_14_E009	679	0.58	22	6.5	7.54	0.05	0.00	0.00	1.52	
KYU_14_E010	52.0	43.8	200	7.9	1.37	0.11	0.00	0.03	0.09	
KYU_14_E012	422	80.4	85	25	8.79	0.04	0.00	0.01	0.86	
KYU_14_E018	8.23	725	7.9	1.7	2.10	0.02	0.00	0.00	0.01	
KYU_14_E019	204	11.2	220	2.3	12.9	0.01	0.00	0.00	0.38	
KYU_14_E020	139	227	670	0.0	1.33	5.92	0.06	0.00	0.22	0.022
KYU_14_F002	190	250	380	0.0	0.39	0.04	1.49	0.05	0.46	0.049
KYU_14_F003	1390	61.3	23	6.1	2.83	0.06	0.00	0.00	3.15	0.19
KYU_14_F004	143	953	160	0.0	2.87	0.03	0.39	0.01	0.19	0.019
KYU_14_F005	181	1030	480	0.0	0.22	0.05	0.00	0.02	0.26	0.040
KYU_14_F006	878	123	14	13	5.40	0.05	0.00	0.00	1.86	0.11
KYU_14_F007	6.11	0.06	920	0.0	0.89	0.02	0.00	0.00	0.01	
KYU_14_F008	4.83	0.97	210	6.6	2.96	0.14	0.00	0.00	0.00	
KYU_14_F009	80.0	19.7	390	11	26.5	0.02	0.00	0.00	0.15	
KYU_14_F010	135	10.8	240	0.0	6.78	0.23	0.00	0.00	0.35	0.014
KYU_14_F011	294	27.5	350	0.0	7.51	0.03	0.00	0.00	0.75	0.027
KYU_14_F012	95.8	22.6	52	0.0	3.05	3.07	0.00	0.00	0.26	
KYU_14_F013	508	8.84	310	0.0	0.53	0.04	0.00	0.00	0.98	
KYU_14_F014	43.0	3.44	9.4	21	8.40	0.01	0.00	0.00	0.06	
KYU_14_F015	660	120	120	0.9	4.84	0.03	0.00	0.00	1.74	0.011
KYU_14_F016	40.2	7.11	17	18	5.10	0.01	0.00	0.00	0.10	
KYU_14_F017	98.2	676	380	0.0	0.40	1.02	0.00	0.12	0.13	
KYU_14_F018	7.01	4.52	52	8.8	1.47	4.28	0.00	0.04	0.00	
KYU_14_F019	5.28	20.3	39	4.7	0.29	0.00	0.00	0.00	0.01	
KYU_15_E009	24.3	0.48	4600	0.0	0.59	0.03	0.00	0.00	0.01	
KYU_15_E010	24.3	0.86	480	0.0	0.41	0.01	0.00	0.00	0.03	
KYU_15_E012	1.72	16.0	44	5.4	0.24	0.00	0.00	0.00	0.00	
KYU_15_E017	158	0.15	780	0.0	0.08	0.04	0.23	0.60	0.35	
KYU_16_A001	3.22	4.99	72	0.0	0.07	6.20		0.03	0.01	
KYU_16_A002#	5.27	7.65	91	0.0	0.08	10.3		0.14	0.11	
KYU_16_A003#	4.92	11.1	150	0.0	0.16	3.71		0.02	0.01	
KYU_16_A004	3.02	6.43	200	0.0	0.06	3.16			0.01	
KYU_16_A005	2.79	8.68	69	0.0	0.17	4.18			0.01	
KYU_16_A006	2.32	2.89	35	0.0	0.04	2.80		0.06	0.01	
KYU_16_A007	3.78	7.33	65	0.2	0.10	4.94	0.01	0.06	0.01	
KYU_16_A008	3.08	7.42	97	0.0	0.07	3.95	0.01	0.04	0.00	
KYU_16_A009	3.15	8.11	77	0.6	0.07	4.84	0.01	0.03	0.01	
KYU_16_A010	3.22	7.94	65	2.9	0.07	4.52	0.00	0.04	0.01	
KYU_16_A011	3.52	7.47	88	0.0	0.11	4.54	0.01	0.08	0.03	
KYU_16_A012	3.08	8.03	54	1.1	0.06	3.91	0.00	0.03	0.00	
KYU_16_A013	3.68	7.35	57	0.0	0.06	5.45	0.01	0.09	0.01	
KYU_16_A014	4.40	8.86	85	0.4	0.07	6.27	0.04	0.23	0.01	
KYU_16_A015	3.59	6.38	45	0.0	0.06	3.39	0.05	0.08	0.01	
KYU_16_A016	3.28	6.59	45	0.1	0.06	3.23	0.04	0.06	0.00	
KYU_16_A017	2.65	5.33	42	0.0	0.05	3.46	0.00	0.03	0.00	
KYU_16_A018	2.63	8.96	50	0.0	0.05	3.14	0.00	0.03	0.00	
KYU_16_A019	2.56	6.80	47	0.0	0.05	3.27	0.00	0.03	0.01	
KYU_16_A020	2.38	4.49	32	0.0	0.04	2.61	0.00	0.04	0.01	
KYU_16_A021	2.51	5.76	36	0.0	0.05	2.80	0.00	0.03	0.00	
KYU_16_A022	2.61	7.31	44	0.0	0.06	3.66	0.00	0.03	0.00	
KYU_16_A023	2.53	5.79	43	0.0	0.06	3.86	0.00	0.03	0.00	
KYU_16_A024	2.59	6.35	52	0.0	0.06	4.06	0.00	0.04	0.00	
KYU_16_A025	3.22	8.49	110	0.0	0.12	3.63	0.00	0.10	0.00	
KYU_16_A026	4.06	7.05	100	0.0	0.09	3.64	0.05	0.10	0.01	
KYU_16_A027	3.62	7.37	41	0.0	0.06	4.60	0.01	0.11	0.00	
KYU_16_A028	2.92	8.61	33	0.0	0.07	1.26		0.17	0.00	
KYU_16_A029	2.73	20.9	39	0.0	0.08	1.33		0.18	0.00	
KYU_16_A030	2.69	5.38	39	0.0	0.04	4.35		0.12	0.01	

Sample_ID	Cl^-	SO_4^{2-}	HCO_3^-	CO_3^{2-}	F^-	NO_3^-	NO_2^-	PO_4^{3-}	Br^-	I
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_16_A031	3.61	7.11	40	0.0	0.02	1.56		0.03	0.01	
KYU_16_A032	3.10	8.35	72	0.0	0.05	3.13		0.04	0.01	
KYU_16_A033	6.60	12.2	53	0.0	0.02	27.1		0.09	0.02	
KYU_16_A034	5.30	14.9	30	0.0	0.02	25.2		0.10	0.02	
KYU_16_A035	6.79	10.3	41	0.0	0.03	30.5		0.09	0.02	
KYU_16_A036	6.19	6.57	70	0.0	0.06	21.6		0.17	0.03	
KYU_16_A037	5.11	6.10	67	0.0	0.11	15.1		0.18	0.02	
KYU_16_B001	4.76	7.52	180	0.0	0.09	6.26		0.01	0.01	
KYU_16_B002	5.49	12.9	110	0.0	0.11	10.6		0.09	0.01	
KYU_16_B003	3.90	8.03	49	0.0	0.05	7.36		0.11	0.02	
KYU_16_B004#	9.23	29.4	69	0.0	0.21	15.7		0.16	0.03	
KYU_16_B005	2.71	16.5	95	0.1	0.05	4.76		0.02	0.00	
KYU_16_B006	5.15	6.51	68	0.6	0.06	5.05	0.01	0.10	0.01	
KYU_16_B007	2.98	4.48	48	0.0	0.04	2.62		0.04	0.01	
KYU_16_B008	3.07	4.46	45	0.0	0.05	2.85	0.00	0.06	0.01	
KYU_16_B009	6.15	5.11	59	0.0	0.05	2.76		0.02	0.01	
KYU_16_B010	2.25	4.96	30	0.0	0.04	1.64		0.02	0.00	
KYU_16_B011	2.46	4.68	33	0.0	0.05	2.29		0.03	0.00	
KYU_16_B012	2.68	5.12	44	0.0	0.05	3.98		0.02	0.00	
KYU_16_B013	2.53	4.77	38	0.0	0.04	1.64		0.02	0.00	
KYU_16_B014	2.75	4.79	40	0.0	0.04	1.98		0.01	0.00	
KYU_16_B015	2.88	6.32	45	0.0	0.05	3.42		0.03	0.00	
KYU_16_B016	3.21	6.58	52	0.0	0.06	4.19	0.01	0.04	0.01	
KYU_16_B017	3.26	7.43	53	0.0	0.06	4.80	0.00	0.04	0.00	
KYU_16_B018	3.08	8.69	60	0.0	0.06	4.11		0.02	0.00	
KYU_16_B019	3.42	8.52	79	0.4	0.06	5.10		0.05	0.00	
KYU_16_B020	3.53	8.61	82	0.3	0.07	4.75	0.00	0.05	0.00	
KYU_16_B021	2.67	5.37	78	0.0	0.07	2.10	0.00	0.04	0.01	
KYU_16_B022	3.77	10.2	78	0.7	0.06	4.41		0.04	0.01	
KYU_16_B023	3.28	8.53	59	0.0	0.06	4.66	0.00	0.04	0.00	
KYU_16_B024	3.31	7.45	50	1.3	0.06	4.47	0.01	0.05	0.00	
KYU_16_B025	4.92	3.04	53	0.0	0.05	6.89	0.49	0.05	0.01	
KYU_16_B026	12.5	7.78	55	0.0	0.06	6.10	0.14	0.05	0.02	
KYU_16_B027	3.92	6.31	75	0.0	0.07	4.02	0.01	0.06	0.01	
KYU_16_B028	3.06	3.99	46	0.0	0.04	7.26		0.15	0.01	
KYU_16_B029	2.63	3.04	40	0.0	0.04	2.29		0.23	0.01	
KYU_16_B030	9.23	34.8	68	0.0	0.22	14.1		0.14	0.03	
KYU_16_B031#	4.18	6.65	92	0.0	0.02	9.29		0.06	0.02	
KYU_16_B032#	1.91	1.76	41	0.0	0.04	0.92		0.10	0.00	
KYU_16_B033#	3.09	4.59	51	0.0	0.05	7.52		0.12	0.01	
KYU_16_B034#	1.91	2.33	42	0.0	0.04	0.83		0.09	0.00	
KYU_16_B035	1.94	2.49	38	0.0	0.04	1.29		0.07	0.00	
KYU_16_J001$	4.16	1.65	55	0.0	0.03	4.80	0.00	0.13	0.02	
KYU_16_J002	4.51	7.18	180	6.7	3.97	0.37	0.00	0.02	0.02	
KYU_16_J005	4.49	15.9	49	4.0	0.08	0.03	0.00	0.05	0.01	
KYU_16_J006	520	9.02	290	0.0	0.37	0.02	0.00	0.01	1.14	
KYU_16_J007#	1.89	2.29	41	0.0	0.04	1.01	0.00	0.09	0.00	
KYU_16_J008	6500	0.13	81	0.0	2.59	0.16	0.00	0.04	14.9	
KYU_16_J009#	9.03	29.2	69	0.0	0.20	16.5	0.00	0.17	0.03	
KYU_16_J010	3520	0.10	170	0.0	1.72	0.15	0.00	0.04	7.44	
KYU_16_J011	7830	405	56	0.0	0.07	0.16	0.00	0.07	26.3	
KYU_16_J012#	4.98	11.6	130	0.0	0.18	3.53	0.00	0.02	0.01	
KYU_16_J013	92.9	1.16	28	20	7.65	0.01	0.00	0.01	0.14	
KYU_16_J014#	4.22	6.33	90	0.0	0.02	10.2	0.00	0.06	0.02	
KYU_16_J015	7.23	0.05	190	0.0	0.69	0.00	0.00	2.18	0.02	
KYU_16_J016	154	11.7	270	0.0	7.86	0.01	0.00	0.08	0.43	0.015
KYU_16_J017	313	29.5	360	0.0	8.00	0.01	0.00	0.02	0.89	0.028
KYU_16_J018	8880	612	31	0.0	0.24	0.43	0.00	0.00	28.8	0.017
KYU_16_J019	8.05	10.3	480	0.0	0.02	0.02	0.00	0.00	0.02	
KYU_16_J020	3520	0.16	3600	0.0	0.44	0.21	0.04	0.00	9.55	0.54
KYU_16_J021	34.9	0.03	550	0.0	0.55	0.02	0.00	0.13	0.09	
KYU_16_J022$	4.16	1.69	55	0.0	0.03	6.40	0.00	0.13	0.02	
KYU_16_J023#	4.86	11.6	130	0.0	0.17	4.81	0.00	0.02	0.01	
KYU_16_J024#	4.98	7.46	93	0.0	0.08	12.7	0.00	0.14	0.08	
KYU_16_J025	39.2	0.26	320	4.8	4.42	0.02	0.00	0.00	0.08	
KYU_16_J026#	8.95	29.1	69	0.0	0.21	18.0	0.00	0.17	0.03	
KYU_16_J027#	2.92	4.65	49	0.0	0.05	9.68	0.00	0.12	0.01	
KYU_16_J028#	1.92	2.31	42	0.0	0.04	1.61	0.00	0.09	0.00	
KYU_16_J029	6.38	0.08	930	0.0	0.89	0.02	0.00	0.00	0.01	
KYU_16_J030#	5.75	45.0	37	0.0	0.63	8.50	0.00	0.51	0.01	

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	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_16_J031	2.72	6.59	180	8.1	1.57	0.12	0.00	0.01	0.00	
KYU_16_J032	14.8	89.2	49	0.0	1.00	6.48	0.00	0.26	0.02	
KYU_16_J033#	1.91	1.75	42	0.0	0.04	1.60	0.00	0.11	0.00	
KYU_16_J034	2.71	1.70	15	20	2.33	0.00	0.00	0.01	0.01	
KYU_16_J035	5.50	20.7	41	4.5	0.26	0.00	0.00	0.00	0.01	
KYU_16_J039$	125	875	72	0.0	5.58	0.03	0.00	0.01	0.20	0.030
KYU_16_J040	225	1410	190	0.0	0.52	0.03	0.00	0.19	0.36	0.050
KYU_16_J041#	14.1	85.7	49	0.0	1.00	3.95	0.00	0.26	0.02	
KYU_16_J042	53.6	173	130	0.0	6.42	0.03	0.19	1.95	0.09	
KYU_16_J043	58.1	335	97	0.0	1.51	0.01	0.00	0.43	0.09	
KYU_16_J044	57.6	492	30	0.0	3.21	1.68	0.25	0.00	0.10	
KYU_16_J045	1.61	2.35	32	0.0	0.06	0.82	0.00	0.03	0.00	
KYU_16_J046	2.36	3.09	23	0.0	0.04	3.78	0.00	0.05	0.00	
KYU_16_J047#	1.87	2.25	42	0.0	0.04	0.80	0.00	0.09	0.00	
KYU_16_J048#	2.88	4.60	50	0.0	0.05	6.57	0.00	0.12	0.01	
KYU_16_J049#	8.81	29.0	69	0.0	0.21	15.2	0.00	0.16	0.03	
KYU_16_J050#	2.95	4.78	53	0.0	0.05	5.49	0.00	0.11	0.01	
KYU_16_J051#	1.88	2.25	43	0.0	0.04	0.59	0.00	0.08	0.00	
KYU_16_J052#	1.88	1.75	43	0.0	0.04	0.66	0.00	0.09	0.00	
KYU_16_J053#	8.95	29.9	69	0.0	0.21	12.8	0.00	0.15	0.03	
KYU_16_J054#	4.75	11.6	130	0.0	0.18	2.01	0.00	0.02	0.01	
KYU_16_J055#	5.22	7.56	97	0.0	0.09	7.63	0.00	0.13	0.09	
KYU_16_J056$	4.13	1.71	56	0.0	0.03	3.12	0.00	0.12	0.02	
KYU_16_J057#	3.89	6.32	91	0.0	0.02	6.93	0.00	0.06	0.02	
KYU_16_J058$	137	945	73	0.0	5.63	0.03	0.00	0.00	0.21	0.023
KYU_16_J059	62.0	326	570	0.0	1.09	0.02	0.00	0.03	0.09	
KYU_16_J060$	161	421	60	0.0	12.7	0.01	0.00	0.00	0.08	0.019
KYU_16_J061	58.8	479	63	0.0	12.7	0.02	0.00	0.00	0.09	
KYU_16_J062	334	2090	260	0.0	0.82	0.05	0.03	0.04	0.51	
KYU_16_J063	27.2	204	110	0.0	0.93	1.26	0.15	0.06	0.04	
KYU_16_J064	226	1390	200	0.0	0.53	0.05	0.06	0.16	0.34	0.050
KYU_16_J065	2.69	6.62	170	8.4	1.59	0.10	0.00	0.01	0.00	
KYU_16_J066	5.34	0.92	300	4.4	2.72	0.01	0.00	0.00	0.01	
KYU_16_J067#	5.66	44.0	36	0.0	0.66	3.88	0.00	0.40	0.01	
KYU_16_J068	35.4	35.2	780	0.0	1.11	0.04	0.01	0.48	0.09	
KYU_16_J069	6.53	0.08	940	0.0	0.95	0.02	0.00	0.00	0.02	
KYU_16_J070	28.8	175	430	0.0	0.46	0.01	0.00	0.08	0.04	
KYU_16_J071	169	1040	220	0.0	2.36	0.03	0.09	0.07	0.25	0.033
KYU_16_J072	45.7	316	170	0.0	1.28	0.04	0.00	0.31	0.07	
KYU_16_J073	90.8	560	190	0.0	1.34	0.01	0.00	4.24	0.13	
KYU_16_J074	152	975	190	0.0	2.78	0.03	0.01	0.05	0.22	0.030
KYU_16_J075#	12.5	76.5	48	0.0	1.00	2.75	0.00	0.23	0.02	
KYU_16_J076	165	943	480	0.0	0.21	0.04	0.01	0.12	0.25	0.038
KYU_16_J077	14.8	33.7	480	0.0	16.1	0.01	0.00	0.02	0.02	
KYU_16_J078	51.7	146	540	0.0	0.24	0.02	0.01	0.02	0.08	
KYU_16_J079	50.3	171	400	0.0	0.79	0.02	0.00	0.01	0.08	
KYU_16_J080	2.76	7.85	34	0.0	0.07	0.88	0.00	0.15	0.00	
KYU_16_J081	2.73	22.1	39	0.0	0.08	0.97	0.00	0.16	0.00	
KYU_16_K001	7.29	33.9	120	0.0	0.43	11.2	0.02	0.15	0.01	
KYU_16_K002	6.25	10.9	77	0.0	0.23	5.79	0.02	0.19	0.01	
KYU_16_K003	4.68	9.05	91	0.0	0.32	5.26	0.18	0.20	0.01	
KYU_16_K004	7.40	14.4	99	0.0	0.40	4.90	0.30	0.17	0.01	
KYU_16_K005	9.15	31.3	110	0.0	0.49	10.9	0.08	0.35	0.02	
KYU_16_K006	2.18	2.52	55	0.0	0.08	1.39	0.00	0.22	0.00	
KYU_16_K007	4.22	7.69	76	0.0	0.23	3.23	0.10	0.25	0.01	
KYU_16_K008	57.1	423	26	0.0	2.46	2.72	0.47	0.00	0.09	
KYU_16_K009	19.2	155	44	0.0	2.52	4.20	0.00	0.00	0.03	
KYU_16_K010	57.5	430	33	0.0	2.45	3.37	0.00	0.00	0.09	
KYU_16_K011	21.9	143	61	0.0	0.98	4.04	0.00	0.09	0.03	
KYU_16_K012	10.2	56.9	49	6.9	0.93	0.68	0.02	0.07	0.02	
KYU_16_K013	4.74	13.9	73	0.0	0.29	4.49	0.00	0.24	0.01	
KYU_16_K014	11.0	63.2	61	0.0	0.80	3.16	0.00	0.20	0.01	
KYU_16_K015	10.6	58.2	74	0.0	0.78	6.24	0.00	0.18	0.02	
KYU_16_K016	10.8	57.7	67	0.0	0.85	3.59	0.00	0.20	0.01	
KYU_16_K017	15.3	77.0	69	0.0	0.94	4.07	0.00	0.23	0.02	
KYU_16_K018	6.96	30.1	70	0.0	0.48	4.24	0.00	0.21	0.01	
KYU_16_K019	40.6	227	72	0.0	1.07	4.13	0.00	0.03	0.06	
KYU_16_K020	6.94	29.5	76	0.0	0.47	4.17	0.00	0.15	0.01	
KYU_16_K021	3.12	7.09	44	0.0	0.12	2.20	0.00	0.09	0.01	
KYU_16_K022	21.8	116	52	0.0	0.64	3.71	0.00	0.08	0.03	

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	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_16_K023	16.3	99.9	67	0.0	0.85	4.22	0.00	0.06	0.03	
KYU_16_K024	10.3	50.1	74	0.0	0.53	4.22	0.00	0.14	0.02	
KYU_16_K025	16.0	98.3	65	0.0	0.84	4.18	0.00	0.06	0.03	
KYU_16_K026	16.4	103	64	0.0	0.93	4.10	0.00	0.05	0.03	
KYU_16_K027	6.72	32.2	39	0.0	0.76	2.18	0.00	0.06	0.01	
KYU_16_K028	15.9	100	63	0.0	0.95	3.92	0.00	0.04	0.03	
KYU_16_K029	15.7	99.1	62	0.0	0.97	3.93	0.00	0.05	0.03	
KYU_16_K030	4.46	18.7	36	0.0	0.64	3.51	0.00	0.09	0.01	
KYU_16_K031	6.05	37.1	47	0.0	2.42	1.99	0.00	0.02	0.01	
KYU_16_K032	5.96	25.9	76	0.0	0.32	10.7	0.00	0.30	0.01	
KYU_16_K033	2.50	4.34	51	0.0	0.10	2.02	0.00	0.19	0.00	
KYU_16_K034	5.44	33.8	57	0.0	0.50	8.10	0.00	0.32	0.01	
KYU_16_K035	6.34	39.9	56	0.0	0.69	8.16	0.00	0.39	0.01	
KYU_16_K036	5.68	35.8	57	0.0	0.56	8.22	0.00	0.38	0.01	
KYU_16_K037	2.79	5.74	75	0.0	0.09	1.99	0.00	0.16	0.00	
KYU_16_K038	9.88	123	26	0.0	0.52	5.34	0.00	0.53	0.01	
KYU_16_K039	8.38	88.4	33	0.0	0.88	3.88	0.00	0.49	0.01	
KYU_16_K040	7.48	66.4	42	0.0	0.94	5.35	0.00	0.46	0.01	
KYU_16_K041	7.23	40.4	63	0.0	0.59	11.2	0.00	0.31	0.01	
KYU_16_K042	1.63	2.42	27	0.0	0.03	0.89	0.00	0.01	0.00	
ASO_16_K018	26.4	246	14	0.0	0.77	2.11	0.00	0.10	0.04	
ASO_16_K019	101	778	15	0.0	3.66	0.64	0.00	0.01	0.15	
ASO_16_K020	73.4	473	43	0.0	10.4	0.20	0.00	0.00	0.11	
KYU_16_J082#	4.97	7.47	90	0.0	0.09	8.11	0.00	0.13	0.09	
KYU_16_J083#	4.76	11.5	130	0.0	0.18	2.10	0.00	0.02	0.01	
KYU_16_J084$	4.09	1.68	55	0.0	0.03	3.12	0.00	0.12	0.02	
KYU_16_J085#	8.94	29.1	68	0.0	0.21	13.1	0.00	0.15	0.03	
KYU_16_J086#	2.89	4.67	51	0.0	0.05	5.24	0.00	0.12	0.01	
KYU_16_J087#	1.87	2.24	42	0.0	0.04	0.60	0.00	0.09	0.00	
KYU_16_J088#	1.87	1.75	42	0.0	0.04	0.63	0.00	0.09	0.00	
KYU_16_J089$	136	949	96	0.0	5.75	0.02	0.00	0.00	0.20	0.024
KYU_16_J090$	178	420	67	0.0	12.7	0.02	0.00	0.00	0.08	0.020
KYU_16_L007	7.87	24.8	97	0.0	0.39	5.04	0.49	0.15	0.01	
KYU_16_L008	3.44	7.14	61	0.0	0.15	2.19	0.06	0.20	0.01	
KYU_16_L009	7.50	34.1	76	0.0	0.49	4.32	0.22	0.16	0.01	
KYU_16_L010	8.07	37.3	75	0.0	0.53	3.95	0.24	0.16	0.01	
KYU_16_L011	8.92	42.7	75	0.0	0.54	3.91	0.25	0.15	0.01	
KYU_16_L012	11.4	58.3	74	0.0	0.56	3.77	0.31	0.15	0.02	
KYU_16_L013	20.9	140	63	0.0	1.03	3.43	0.29	0.04	0.03	
KYU_16_L014	17.3	108	67	0.0	0.88	3.87	0.32	0.07	0.03	
KYU_16_L015	17.2	108	66	0.0	0.93	3.75	0.31	0.06	0.03	
KYU_16_L016	17.6	113	64	0.0	1.03	3.75	0.29	0.05	0.03	
KYU_16_L017	17.2	111	63	0.0	1.06	3.69	0.25	0.02	0.03	
KYU_16_L018	17.2	111	64	0.0	1.08	3.56	0.33	0.06	0.03	
KYU_16_L019	6.17	39.6	47	0.0	2.61	1.80	0.00	0.01	0.01	
KYU_16_L020	5.26	23.1	41	0.0	0.78	3.36	0.34	0.11	0.01	
KYU_16_L021	5.59	27.8	37	0.0	0.83	2.20	0.01	0.04	0.01	
KYU_16_L022	29.1	163	63	0.0	0.64	3.46	0.06	0.11	0.04	
KYU_16_L023	9.78	60.2	56	0.0	0.46	1.00	0.16	0.01	0.02	
KYU_16_L024	19.8	175	44	0.0	2.87	3.28	0.04	0.00	0.03	
KYU_16_L025	55.4	431	31	0.0	2.71	2.40	0.10	0.02	0.09	
KYU_16_L026	3.72	9.22	47	0.0	0.17	1.98	0.31	0.12	0.01	
KYU_16_L027	59.9	248	76	0.0	1.03	3.54	0.15	0.03	0.07	
KYU_16_L028	14.3	76.3	68	0.0	0.94	3.76	0.09	0.20	0.02	
KYU_16_L029	11.0	63.0	64	0.0	0.79	3.00	0.08	0.17	0.01	
KYU_16_L030	11.0	60.3	77	0.0	0.79	5.31	0.23	0.15	0.01	
KYU_16_L031	11.2	70.3	63	0.0	0.95	2.45	0.05	0.09	0.01	
KYU_16_L032	2.24	2.71	54	0.0	0.08	1.54	0.00	0.21	0.00	
KYU_16_L033	6.26	16.3	93	0.0	0.34	5.80	0.00	0.17	0.01	
KYU_16_L034	11.3	43.8	110	0.0	0.54	11.8	0.00	0.23	0.02	
KYU_16_L035	5.52	6.00	64	0.0	0.07	9.18	0.00	0.19	0.02	
KYU_16_K043	6.74	59.4	51	0.0	0.62	5.21	0.00	0.22	0.01	
KYU_16_K044	5.60	38.4	59	0.0	0.44	5.92	0.00	0.23	0.01	
KYU_16_K045	6.20	48.4	57	0.0	0.50	5.65	0.00	0.24	0.01	
KYU_16_K046	5.88	44.2	58	0.0	0.49	5.20	0.01	0.24	0.01	
KYU_16_K047	5.85	43.5	58	0.0	0.49	5.09	0.01	0.25	0.01	
KYU_16_K048	7.01	50.8	66	0.0	0.54	4.65	0.01	0.24	0.01	
KYU_16_K049	6.52	45.7	65	0.0	0.48	4.64	0.01	0.23	0.01	
KYU_16_K050	6.47	44.2	69	0.0	0.48	4.45	0.01	0.23	0.01	
KYU_16_K051	6.53	46.6	58	0.0	0.72	11.2	0.00	0.29	0.01	

Sample_ID	Cl^-	SO_4^{2-}	HCO_3^-	CO_3^{2-}	F^-	NO_3^-	NO_2^-	PO_4^{3-}	Br^-	I
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_16_K052	6.37	46.8	53	0.0	0.55	5.26	0.00	0.30	0.01	
KYU_16_K053	7.17	81.0	44	0.0	0.72	4.76	0.00	0.16	0.01	
KYU_16_K054	2.83	6.79	64	0.0	0.11	2.59	0.00	0.15	0.00	
KYU_16_K055	5.43	20.8	78	0.0	0.26	10.6	0.00	0.33	0.01	
KYU_16_K056	5.61	39.8	58	0.0	0.41	5.65	0.00	0.23	0.01	
KYU_16_K057	8.63	91.7	39	0.0	0.64	5.44	0.00	0.33	0.01	
KYU_16_K058	9.33	84.1	57	0.0	0.78	5.78	0.00	0.45	0.01	
KYU_16_K059	6.00	49.0	40	0.0	0.72	4.18	0.07	0.21	0.01	
KYU_16_K060	3.32	10.8	59	0.0	0.20	2.20	0.05	0.17	0.01	
KYU_16_K061	3.34	13.3	58	0.0	0.16	3.77	0.00	0.13	0.01	
KYU_16_K062	4.44	21.9	61	0.0	0.25	5.22	0.00	0.19	0.01	
KYU_16_K063	5.57	37.3	59	0.0	0.42	4.90	0.01	0.22	0.01	
KYU_16_K064	4.39	21.4	60	0.0	0.25	4.80	0.00	0.19	0.01	
KYU_16_K065	3.63	12.2	52	0.0	0.08	5.19	0.01	0.10	0.00	
KYU_16_K066	4.06	14.5	59	0.0	0.13	5.81	0.00	0.14	0.01	
KYU_16_K067	10.5	75.3	77	0.0	0.90	3.11	0.01	0.23	0.01	
KYU_16_K068	7.65	51.1	140	0.0	0.66	1.24	0.00	0.49	0.01	
KYU_16_K069	5.02	46.8	45	0.0	0.34	3.37	0.00	0.11	0.01	
ASO_16_K025	26.8	247	14	0.0	0.78	2.14	0.00	0.11	0.03	
ASO_16_K027	96.3	738	15	0.0	3.44	0.64	0.00	0.01	0.13	
ASO_16_K028	24.6	206	19	0.0	0.71	0.52	0.00	0.18	0.03	
ASO_16_K029	10.3	59.0	42	0.0	0.93	1.83	0.00	0.05	0.02	
ASO_16_K030	16.5	142	8.8	0.0	0.67	3.05	0.00	0.44	0.02	
ASO_16_K031	8.77	50.0	48	0.0	1.04	11.9	0.00	0.00	0.01	
ASO_16_K032	18.3	170	28	0.0	1.25	0.85	0.00	0.00	0.03	
ASO_17_K001	147	1140	170	0.0	5.81	0.04	0.00	0.02	0.32	
ASO_17_K002	119	926	110	0.0	6.85	0.02	0.00	0.00	0.26	
ASO_17_K003	44.9	381	47	0.0	8.32	0.01	0.00	0.00	0.10	
ASO_17_K004	96.8	770	15	0.0	3.57	0.57	0.00	0.00	0.22	
ASO_17_K005	156	1190	19	0.0	2.18	0.03	0.00	1.66	0.37	
ASO_17_K006	7.98	50.4	48	0.0	1.04	10.3	0.00	0.00	0.03	
ASO_17_K007	56.2	582	43	0.0	9.50	0.01	0.01	0.00	0.13	
ASO_17_K008	168	1450	50	0.0	6.37	0.07	0.01	0.02	0.39	
ASO_17_K009	92.9	828	19	0.0	3.17	0.01	0.00	0.02	0.20	
ASO_17_K010	75.6	556	13	0.0	3.21	0.02	0.00	0.01	0.17	
ASO_17_K012	35.6	391	56	0.0	8.69	0.01	0.00	0.00	0.09	
ASO_17_K013	197	1690	65	0.0	7.88	0.03	0.00	0.00	0.45	
ASO_17_K014	23.8	202	20	0.0	0.77	0.44	0.00	0.14	0.05	
ASO_17_K015	24.5	214	25	0.0	0.51	0.16	0.00	0.99	0.06	
ASO_17_K016	34.4	401	16	0.0	1.30	0.02	0.00	0.00	0.09	
ASO_17_K017	1.61	2.10	28	0.0	0.04	0.42	0.00	0.03	0.00	
ASO_17_K018	206	1710	67	0.0	7.85	0.02	0.00	0.00	0.44	
ASO_17_K019	2.23	3.15	25	0.0	0.04	2.63	0.00	0.04	0.00	
ASO_17_K020	186	1110	260	0.0	0.98	0.02	0.00	0.00	0.39	
ASO_17_K021	233	0.10	1100	0.0	0.92	0.02	0.00	0.02	0.73	
ASO_17_K022	1.37	2.85	21	0.0	0.04	0.04	0.00	0.02	0.00	
KYU_17_J091$	171	412	52	0.0	12.9	0.01	0.00	0.00	0.07	0.018
KYU_17_J092$	126	871	91	0.0	5.61	0.01	0.00	0.00	0.17	0.027
KYU_17_J093#	2.87	4.50	51	0.0	0.04	4.87	0.00	0.12	0.01	
KYU_17_J094#	1.86	2.24	43	0.0	0.03	0.59	0.00	0.09	0.00	
KYU_17_J095#	1.85	1.74	43	0.0	0.04	0.56	0.00	0.09	0.00	
KYU_17_J096#	8.82	27.7	69	0.0	0.20	13.4	0.00	0.16	0.02	
KYU_17_J097$	4.11	1.68	55	0.0	0.02	3.15	0.00	0.12	0.01	
KYU_17_J098#	5.17	7.58	97	0.0	0.08	7.53	0.00	0.13	0.08	
KYU_17_J099#	4.61	10.8	150	0.0	0.15	2.55	0.00	0.02	0.01	
KYU_17_J100#	5.65	44.7	38	0.0	0.60	4.19	0.00	0.44	0.00	
KYU_17_J101#	11.9	73.2	47	0.0	0.97	2.64	0.00	0.25	0.01	
ASO_17_K023	2.21	2.50	24	0.0	0.05	1.60	0.00	0.04	0.00	
ASO_17_K024	210	1690	49	0.0	8.02	0.03	0.00	0.00	0.44	
ASO_17_K025	188	1090	260	0.0	1.13	0.02	0.00	0.02	0.39	
ASO_17_K026	2.39	3.32	24	0.0	0.05	2.81	0.01	0.05	0.00	
ASO_17_K027	252	0.67	1100	0.0	1.10	0.52	0.02	0.00	0.78	
ASO_17_K028	1.73	2.52	18	0.0	0.06	0.14	0.00	0.01	0.00	
KYU_17_T001	51.4	0.83	180	0.0	0.24	7.68	0.00	0.24	0.09	0.007
ASO_17_K029	245	0.07	1500	0.0	1.01	0.02	0.00	0.01	0.75	
ASO_17_K030	193	1140	360	0.0	1.08	0.02	0.00	0.03	0.39	
ASO_17_K031	2.92	3.02	33	0.0	0.05	3.01	0.00	0.05	0.00	
ASO_17_K032	1.56	2.25	35	0.0	0.05	0.50	0.00	0.01	0.00	
ASO_17_K033	1.32	2.27	23	0.0	0.05	0.02	0.00	0.02	0.00	
ASO_17_K034	198	1610	49	0.0	8.15	0.02	0.00	0.00	0.42	

Sample_ID	Cl^-	SO_4^{2-}	HCO_3^-	CO_3^{2-}	F^-	NO_3^-	NO_2^-	PO_4^{3-}	Br^-	I
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_17_A003	11200	0.00	5200	0.0	0.40	0.17	0.00	0.00	20.2	
KYU_17_A005	676	1.03	23	6.7	7.76	0.02	0.00	0.00	1.68	
KYU_17_A006	243	361	490	0.0	0.25	0.02	0.00	0.13	0.65	0.072
KYU_17_A007	174	205	320	0.0	0.32	1.13	0.00	0.03	0.47	0.049
KYU_17_A008	136	118	260	0.0	0.26	1.41	0.00	0.23	0.38	0.040
KYU_17_A009	4.78	6.63	65	0.0	0.07	8.43	0.00	0.21	0.02	
KYU_17_A010#	8.87	28.8	69	0.0	0.21	13.0	0.00	0.17	0.03	
KYU_17_A011	4.07	1.71	55	0.0	0.03	3.29	0.02	0.12	0.02	
KYU_17_A012	8870	612	31	0.0	0.25	0.18	0.00	0.18	28.6	
KYU_17_A013	1980	8.11	1900	0.0	1.32	0.05	0.00	0.00	5.35	
KYU_17_A014	534	6.85	320	0.0	0.53	0.02	0.00	0.00	1.14	
KYU_17_A015	156	11.7	270	0.0	7.73	0.01	0.00	0.04	0.44	0.015
KYU_17_A016	305	27.4	360	0.0	8.08	0.01	0.00	0.01	0.85	0.027
KYU_17_A017	6350	0.03	81	0.0	2.58	0.08	0.00	0.17	13.9	
KYU_17_A018	39.7	0.36	320	4.2	4.42	0.00	0.00	0.00	0.07	
KYU_17_A019#	5.09	7.64	93	0.0	0.08	7.64	0.00	0.15	0.09	
KYU_17_A020	3700	0.08	170	0.0	1.73	0.09	0.00	0.09	7.55	
KYU_17_A021	5.91	0.17	940	0.0	1.04	0.01	0.00	0.00	0.01	
KYU_17_A022	98.6	643	320	0.0	0.64	0.02	0.00	0.02	0.14	
KYU_17_A023	136	955	73	0.0	5.62	0.01	0.00	0.00	0.20	0.031
KYU_17_A024	114	409	59	0.0	13.0	0.01	0.00	0.00	0.07	0.019
KYU_17_A025	161	1020	210	0.0	2.55	0.02	0.00	0.01	0.23	0.036
ASO_17_K035	27.6	245	15	0.0	0.80	1.93	0.00	0.10	0.04	
ASO_17_K036	96.8	734	17	0.0	3.33	0.90	0.00	0.01	0.15	
ASO_17_K037	160	1180	17	0.0	2.22	0.00	0.00	1.47	0.26	
ASO_17_K039	9.39	53.7	43	0.0	1.07	12.9	0.00	0.00	0.02	
ASO_17_K040	1.56	2.00	37	0.0	0.05	0.46	0.00	0.03	0.00	
ASO_17_K041	205	1690	46	0.0	7.89	0.00	0.00	0.00	0.37	
ASO_17_K042	224	0.95	1100	0.0	1.09	0.20	0.00	0.00	0.62	
ASO_17_K043	1.43	2.41	24	0.0	0.05	0.06	0.00	0.02	0.00	
ASO_17_K044	199	1180	270	0.0	1.07	0.00	0.00	0.00	0.36	
ASO_17_K045	2.75	3.17	26	0.0	0.05	2.52	0.00	0.05	0.00	
KYU_17_B001	3.95	6.84	58	0.0	0.10	4.47	0.06	0.08	0.01	
KYU_17_B002	2.19	2.91	40	0.0	0.05	2.24	0.02	0.05	0.01	
KYU_17_B003	2.02	2.74	43	0.0	0.05	1.13	0.00	0.07	0.00	
KYU_17_B004	3.03	6.39	32	0.0	0.07	4.50	0.00	0.02	0.00	
KYU_17_B005	2.40	5.09	53	0.0	0.05	2.46	0.00	0.03	0.00	
KYU_17_B006	3.52	5.75	36	0.0	0.07	2.29	0.00	0.08	0.00	
KYU_17_B007	2.69	5.37	25	0.0	0.08	2.03	0.02	0.03	0.00	
KYU_17_B008	3.10	8.09	39	0.0	0.09	2.71	0.00	0.02	0.00	
KYU_17_B009	3.59	7.67	44	0.0	0.09	5.99	0.00	0.04	0.00	
KYU_17_B010	2.29	2.63	32	0.0	0.03	0.37	0.00	0.01	0.00	
KYU_17_B011	2.25	3.30	42	0.0	0.06	0.96	0.00	0.06	0.00	
KYU_17_B012	2.56	3.83	44	0.0	0.06	1.43	0.00	0.04	0.00	
KYU_17_B013	4.58	8.71	81	0.0	0.08	4.17	0.01	0.18	0.01	
KYU_17_B014	3.38	8.48	89	0.0	0.09	3.56	0.00	0.07	0.01	
KYU_17_B015	4.32	6.06	70	0.0	0.07	4.04	0.01	0.13	0.01	
KYU_17_B016	8.80	5.45	72	0.0	0.07	1.93	0.00	0.03	0.02	
KYU_17_B017	3.41	5.08	52	0.0	0.06	1.38	0.00	0.01	0.00	
KYU_17_B018	2.98	3.65	43	0.0	0.06	2.47	0.01	0.08	0.01	
KYU_17_B019	2.71	5.94	62	0.0	0.15	4.67	0.01	0.30	0.00	
KYU_17_B020	2.88	6.24	60	0.0	0.12	3.94	0.00	0.14	0.00	
KYU_17_B021	2.80	5.76	60	0.0	0.12	4.66	0.01	0.16	0.01	
KYU_17_B022	2.71	4.30	53	0.0	0.09	3.13	0.00	0.07	0.00	
KYU_17_B023	2.18	3.08	51	0.0	0.09	1.62	0.00	0.04	0.00	
KYU_17_B024	2.88	3.12	42	0.0	0.07	3.67	0.00	0.03	0.01	
KYU_17_B025	2.69	3.07	43	0.0	0.06	2.17	0.00	0.02	0.01	
KYU_17_B026	2.52	4.46	34	0.0	0.06	1.70	0.00	0.04	0.00	
KYU_17_B027	2.38	5.01	40	0.0	0.06	1.56	0.00	0.02	0.00	
KYU_17_B028	3.39	4.03	40	0.0	0.05	2.49	0.00	0.03	0.00	
KYU_17_B029	2.81	3.19	51	0.0	0.05	1.33	0.00	0.07	0.00	
KYU_17_B030	2.39	5.43	51	0.0	0.06	2.66	0.00	0.01	0.00	
KYU_17_B031	3.04	3.45	46	0.0	0.06	2.85	0.00	0.09	0.01	
KYU_17_B032	2.66	3.10	39	0.0	0.06	1.83	0.00	0.07	0.00	
KYU_17_B033	2.42	3.02	38	0.0	0.06	1.73	0.00	0.06	0.00	
KYU_17_B034	2.96	3.20	47	0.0	0.06	3.53	0.02	0.09	0.01	
KYU_17_B035	2.97	2.80	41	0.0	0.07	3.37	0.00	0.09	0.01	
KYU_17_B036	2.26	3.20	57	0.0	0.05	1.11	0.00	0.12	0.01	
KYU_17_B037	2.94	3.27	36	0.0	0.05	2.50	0.01	0.02	0.01	
KYU_17_B038	3.30	2.84	45	0.0	0.05	6.54	0.00	0.06	0.01	

Sample_ID	Cl^-	SO_4^{2-}	HCO_3^-	CO_3^{2-}	F^-	NO_3^-	NO_2^-	PO_4^{3-}	Br^-	I
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_17_B039	2.89	2.99	44	0.0	0.06	2.78	0.00	0.08	0.01	
KYU_17_B040	2.34	4.48	37	0.0	0.06	1.12	0.06	0.01	0.00	
KYU_17_B041	2.23	4.36	37	0.0	0.08	2.40	0.00	0.04	0.01	
KYU_17_B042	2.57	5.70	45	0.0	0.08	2.23	0.00	0.03	0.00	
KYU_17_B043	2.56	3.66	37	0.0	0.06	2.39	0.00	0.04	0.00	
KYU_17_B044	2.27	3.09	50	0.0	0.08	1.50	0.00	0.03	0.00	
KYU_17_B045	5.71	6.41	62	0.0	0.06	5.16	0.03	0.16	0.01	
KYU_17_B046	3.39	5.98	81	0.0	0.08	3.38	0.01	0.08	0.01	
KYU_17_B047	4.34	5.88	64	0.0	0.07	3.84	0.00	0.05	0.02	
KYU_17_B048	13.8	88.2	74	0.0	0.75	5.29	0.00	0.33	0.02	
KYU_17_B049	3.30	8.32	85	0.0	0.08	3.64	0.00	0.06	0.00	
KYU_17_C001	2.02	20.8	26	0.0	0.07	0.76	0.00	0.02	0.00	
KYU_17_C002	2.27	2.42	34	0.0	0.05	0.55	0.02	0.02	0.00	
KYU_17_C003	2.05	58.6	27	0.0	0.08	0.82	0.00	0.03	0.00	
KYU_17_C004	2.15	2.01	38	0.0	0.05	0.46	0.00	0.08	0.00	
KYU_17_C005	2.70	2.32	42	0.0	0.06	1.12	0.00	0.13	0.00	
KYU_17_C006	2.44	5.18	28	0.0	0.03	1.00	0.00	0.02	0.00	
KYU_17_C007	2.13	2.43	21	0.0	0.03	0.80	0.00	0.01	0.00	
KYU_17_C008	2.21	15.1	27	0.0	0.05	0.95	0.00	0.02	0.00	
KYU_17_C009	2.04	3.58	23	0.0	0.03	0.87	0.00	0.00	0.00	
KYU_17_C010	2.10	2.91	21	0.0	0.03	0.95	0.00	0.00	0.00	
KYU_17_C011	2.44	22.0	22	0.0	0.08	1.85	0.01	0.12	0.00	
KYU_17_C012	2.39	7.95	27	0.0	0.04	1.37	0.00	0.05	0.00	
KYU_17_C013	2.39	45.6	17	0.0	0.16	0.81	0.00	0.00	0.00	
KYU_17_C014	2.35	10.5	25	0.0	0.05	2.12	0.00	0.24	0.00	
KYU_17_C015	2.09	2.49	24	0.0	0.03	0.66	0.00	0.02	0.00	
KYU_17_C016	2.62	11.3	37	0.0	0.05	1.78	0.01	0.07	0.01	
KYU_17_C017	2.78	3.45	33	0.0	0.04	2.36	0.01	0.09	0.01	
KYU_17_C018	1.88	2.37	42	0.0	0.06	1.43	0.00	0.16	0.01	
KYU_17_C019	2.28	2.64	36	0.0	0.06	1.39	0.00	0.05	0.00	
KYU_17_C020	1.49	1.30	40	0.0	0.08	0.23	0.00	0.19	0.00	
KYU_17_C021	2.93	4.67	48	0.0	0.09	2.42	0.02	0.08	0.01	
KYU_17_C022	5.71	3.95	45	0.0	0.09	2.48	0.00	0.03	0.03	
KYU_17_C023	3.15	4.63	38	0.0	0.11	6.12	0.00	0.02	0.00	
KYU_17_C024	3.94	4.22	56	0.0	0.11	8.55	0.00	0.10	0.01	
KYU_17_C025	5.83	7.56	66	0.0	0.14	15.0	0.00	0.11	0.01	
KYU_17_C026	7.59	13.1	59	0.0	0.12	36.4	0.00	0.13	0.01	
KYU_17_C027	5.93	10.7	73	0.0	0.17	12.3	0.00	0.17	0.01	
KYU_17_C028	4.99	10.5	70	0.0	0.14	10.5	0.01	0.17	0.01	
KYU_17_C029	3.31	7.76	73	0.0	0.17	6.54	0.10	0.24	0.01	
KYU_17_C030	3.23	8.02	56	0.0	0.11	4.56	0.01	0.07	0.01	
KYU_17_C031	3.49	7.84	68	0.0	0.15	9.05	0.30	0.29	0.01	
KYU_17_C032	2.63	5.78	58	0.0	0.13	4.68	0.00	0.09	0.01	
KYU_17_C033	2.42	5.47	55	0.0	0.12	3.71	0.00	0.09	0.01	
KYU_17_C034	2.16	4.81	49	0.0	0.12	2.41	0.00	0.07	0.01	
KYU_17_C035	2.57	6.11	54	0.0	0.12	2.95	0.00	0.07	0.00	
KYU_17_C036	2.44	5.90	38	0.0	0.09	2.10	0.00	0.02	0.00	
KYU_17_C037	2.06	16.9	16	0.0	0.22	0.86	0.00	0.00	0.00	
KYU_17_C038	1.88	25.1	13	0.0	0.15	0.56	0.00	0.00	0.00	
KYU_17_C039	2.07	7.06	16	0.0	0.17	0.51	0.00	0.00	0.00	
KYU_17_C040	3.12	7.55	66	0.0	0.16	4.31	0.00	0.14	0.00	
KYU_17_C041	4.36	11.3	71	0.0	0.13	11.2	0.00	0.14	0.01	
KYU_17_C042	5.19	13.3	76	0.0	0.15	13.2	0.00	0.17	0.01	
KYU_17_C043	5.85	10.8	68	0.0	0.17	14.5	0.00	0.13	0.01	
KYU_17_C044	4.10	12.0	75	0.0	0.16	11.4	0.01	0.13	0.01	
KYU_17_D001	3.10	3.15	47	0.0	0.07	2.68	0.00	0.07	0.01	
KYU_17_D002	3.24	4.17	46	0.0	0.07	4.12	0.00	0.40	0.01	
KYU_17_D003	1.85	2.12	40	0.0	0.05	0.74	0.00	0.11	0.00	
KYU_17_D004	2.00	2.58	44	0.0	0.05	1.12	0.00	0.08	0.00	
KYU_17_D005	11.6	7.08	55	0.0	0.07	6.86	0.00	0.65	0.01	
KYU_17_D006	2.04	2.49	42	0.0	0.05	1.30	0.00	0.11	0.00	
KYU_17_D007	2.97	5.32	53	0.0	0.06	2.19	0.00	0.03	0.01	
KYU_17_D008	4.14	4.59	57	0.0	0.06	6.18	0.00	0.14	0.00	
KYU_17_D009	3.13	5.02	57	0.0	0.09	4.16	0.00	0.07	0.00	
KYU_17_D010	3.43	7.06	62	0.0	0.14	1.77	0.00	0.06	0.01	
KYU_17_D011	2.30	2.53	37	0.0	0.05	1.71	0.00	0.10	0.01	
KYU_17_D012	1.97	3.83	26	0.0	0.03	1.53	0.00	0.03	0.02	
KYU_17_D013	4.60	3.38	27	0.0	0.03	8.10	0.00	0.08	0.02	
KYU_17_D014	3.38	4.72	38	0.0	0.05	6.85	0.00	0.10	0.02	
KYU_17_D015	2.51	4.54	34	0.0	0.05	2.42	0.02	0.02	0.01	
KYU_17_D016	3.27	3.67	44	0.0	0.08	7.00	0.01	0.24	0.01	

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	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
KYU_17_D017	290	332	43	0.0	2.97	43.4	3.32	1.40	0.19	
KYU_17_D018	13.4	14.9	90	0.0	0.06	48.4	0.00	0.75	0.03	
KYU_17_D019	3.67	6.67	57	0.0	0.06	9.37	0.00	0.20	0.01	
KYU_17_D020	3.12	5.04	39	0.0	0.07	4.30	0.00	0.05	0.01	
KYU_17_D021	4.40	5.41	50	0.0	0.11	7.15	0.00	0.18	0.01	
KYU_17_D022	38.5	18.2	100	0.0	0.12	21.0	0.15	1.89	0.04	
KYU_17_D023	11.2	8.36	73	0.0	0.20	8.87	0.00	0.49	0.03	
KYU_17_D024	212	196	42	0.0	0.86	46.6	0.00	1.20	0.13	
KYU_17_D025	11.8	19.4	69	0.0	0.11	27.1	0.14	0.29	0.04	
KYU_17_D026	12.3	18.7	72	0.0	0.07	30.8	0.07	0.42	0.06	
KYU_17_D027	7.99	14.0	57	0.0	0.05	33.8	0.00	0.22	0.10	
KYU_17_D028	26.3	86.5	79	0.0	0.73	7.75	0.00	0.90	0.03	
KYU_17_D029	26.8	26.1	84	0.0	0.18	20.5	0.00	0.71	0.07	
KYU_17_D030	10.7	22.8	58	0.0	0.05	23.8	0.03	0.20	0.04	
KYU_17_D031	7.31	12.1	50	0.0	0.05	20.2	0.00	0.10	0.02	
KYU_17_D032	13.0	15.7	74	0.0	0.08	17.4	0.00	0.47	0.07	
KYU_17_D033	52.3	72.6	88	0.0	0.62	41.0	0.00	1.40	0.10	
KYU_17_D034	9.74	22.2	75	0.0	0.18	18.4	0.00	0.18	0.03	
KYU_17_D035	11.8	20.4	55	0.0	0.07	34.3	0.00	0.71	0.05	
KYU_17_D036	10.1	24.1	52	0.0	0.04	19.3	0.06	0.09	0.04	
KYU_17_D037	8.57	14.9	63	0.0	0.06	30.7	0.00	0.46	0.04	
KYU_17_D038	3.44	5.08	34	0.0	0.05	3.63	0.02	0.09	0.01	
KYU_17_D039	5.36	9.55	55	0.0	0.28	6.22	0.04	0.33	0.01	
KYU_17_D040	13.9	88.4	73	0.0	0.79	4.21	0.00	0.21	0.03	
KYU_17_E001#	1.95	2.35	43	0.0	0.05	0.62	0.00	0.10	0.00	
KYU_17_E002#	3.00	4.68	52	0.0	0.06	5.11	0.00	0.15	0.01	
KYU_17_E003	5.02	7.17	25	0.0	0.06	5.86	0.00	0.08	0.02	
KYU_17_E004	4.84	5.86	64	0.0	0.09	8.62	0.00	0.24	0.02	
KYU_17_E005#	9.10	29.2	68	0.0	0.23	13.0	0.01	0.19	0.03	
KYU_17_E006#	5.40	7.87	100	0.0	0.10	7.53	0.00	0.16	0.10	
KYU_17_E007$	134	917	87	0.0	5.87	0.00	0.00	0.00	0.25	
KYU_17_E008$	169	411	61	0.0	13.4	0.00	0.00	0.00	0.09	
ASO_18_K001	2.44	3.16	25	0.0	0.05	2.43	0.00	0.05	0.00	
ASO_18_K002	1.58	2.06	28	0.0	0.05	0.53	0.00	0.02	0.00	
ASO_18_K003	1.37	2.64	23	0.0	0.06	0.13	0.00	0.01	0.00	
ASO_18_K004	213	0.02	1200	0.0	0.99	0.04	0.00	0.00	0.65	
ASO_18_K005	206	1740	79	0.0	8.15	0.04	0.00	0.00	0.39	
ASO_18_K006	196	1180	270	0.0	1.06	0.03	0.00	0.00	0.34	
ASO_18_K007	1.86	2.52	20	0.0	0.05	1.40	0.00	0.01	0.00	
ASO_18_K008	168	1060	260	0.0	1.05	0.00	0.00	0.00	0.33	
ASO_18_K009	2.70	2.79	23	0.0	0.06	2.91	0.00	0.03	0.00	
ASO_18_K010	1.32	2.21	17	0.0	0.06	0.08	0.00	0.01	0.00	
ASO_18_K011	246	0.00	1100	0.0	1.34	0.00	0.00	0.00	0.67	
KYU_18_A001	276	1820	230	0.0	0.23	0.68	0.00	0.00	0.59	0.066
KYU_18_A002	266	1590	320	0.0	0.43	0.05	0.00	0.00	0.57	0.063
KYU_18_A003$	131	925	85	0.0	5.74	0.00	0.00	0.00	0.28	0.028
KYU_18_A004$	165	413	61	0.0	13.0	0.00	0.00	0.00	0.12	0.019
KYU_18_A005	3.25	34.6	140	0.0	0.34	0.90	0.06	1.07	0.01	
KYU_18_A006	0.48	19.4	100	0.0	0.19	0.00	0.00	0.02	0.00	
KYU_18_A008#	5.55	43.5	40	0.0	0.60	5.28	0.00	0.61	0.01	
KYU_18_A012#	11.2	70.0	47	0.0	0.95	2.67	0.00	0.30	0.02	
KYU_18_A013#	1.91	2.26	43	0.0	0.04	0.87	0.01	0.11	0.00	
KYU_18_A014#	2.80	4.62	52	0.0	0.05	5.65	0.00	0.16	0.02	
KYU_18_A015#	8.72	30.0	68	0.0	0.22	12.9	0.00	0.23	0.04	
KYU_18_A016#	4.54	10.6	150	0.0	0.17	2.57	0.00	0.01	0.01	
KYU_18_A017#	4.59	7.48	77	0.0	0.08	9.21	0.00	0.22	0.11	
ASO_18_K012	1.48	2.11	29	0.0	0.04	0.63	0.00	0.02	0.00	
ASO_18_K013	193	1190	270	0.0	1.02	0.04	0.00	0.00	0.39	0.043
ASO_18_K014	3.14	2.87	23	0.0	0.05	3.03	0.00	0.07	0.00	
ASO_18_K015	1.33	2.42	21	0.0	0.05	0.02	0.00	0.01	0.00	
ASO_18_K016	219	0.22	1100	0.0	0.92	0.02	0.00	0.00	0.73	
ASO_18_K017	187	1610	52	0.0	7.65	0.00	0.00	0.00	0.36	0.035
KYU_18_B001	66.2	218	450	0.0	0.20	0.01	0.00	0.00	0.07	0.004
KYU_18_B002	1.80	21.7	59	0.0	0.35	2.50	0.00	0.01	0.00	
KYU_18_B003	1.85	9.04	48	0.0	1.16	1.45	0.00	0.00	0.00	
KYU_18_B004	28.5	574	630	0.0	0.18	0.03	0.00	0.00	0.06	
KYU_18_B005	50.2	579	1400	0.0	0.36	0.26	0.02	0.00	0.11	0.010
KYU_18_B006	1.57	4.80	33	0.0	0.55	1.24	0.00	0.00	0.00	
KYU_18_B007	61.5	494	110	0.0	0.44	0.01	0.00	1.21	0.08	0.005
KYU_18_B008	5.19	15.1	150	0.0	0.05	0.34	0.00	0.02	0.01	

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	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
ASO_18_K018	1.43	1.77	36	0.0	0.05	0.32	0.00	0.08	0.00	
ASO_18_K019	1.30	2.17	29	0.0	0.05	0.05	0.00	0.04	0.00	
ASO_18_K020	2.51	2.94	25	0.0	0.05	2.31	0.00	0.06	0.00	
ASO_18_K021	202	1710	53	0.0	8.00	0.01	0.00	0.00	0.42	
ASO_18_K022	192	1170	270	0.0	1.08	0.03	9.47	0.00	0.39	
ASO_18_K023	218	0.14	1100	0.0	1.05	0.01	0.00	0.00	0.67	
KYU_19_A001	153	550	2000	0.0	0.13	0.04	6.85	0.04	0.35	
KYU_19_A002	298	523	1300	0.0	0.30	0.06	0.00	0.00	0.68	
KYU_19_A003	71.6	469	1400	0.0	0.22	0.03	0.00	0.30	0.17	0.017
KYU_19_A004	3.47	10.5	200	0.0	0.30	0.00	0.00	0.20	0.01	
KYU_19_A005	135	173	1000	0.0	0.27	0.02	0.00	0.00	0.37	0.024
KYU_19_A006	93.5	140	700	0.0	0.53	0.01	0.00	0.04	0.26	0.018
KYU_19_A007	1410	69.9	24	3.9	2.95	0.02	0.00	0.00	4.00	0.20
KYU_19_A015	2.30	26.9	20	0.0	0.08	0.91	0.00	0.02	0.00	
KYU_19_A016	14.3	128	2.9	0.0	0.17	0.55	0.00	0.00	0.01	
KYU_19_A017	10.5	96.6	8.2	0.0	0.15	0.61	0.00	0.00	0.01	
KYU_19_A019	393	124	2.0	0.0	1.40	0.52	0.96	0.00	1.17	
KYU_19_A020	214	319	1000	0.0	0.21	0.02	0.00	0.00	0.48	0.041
KYU_19_A021	298	19.3	63	0.0	0.64	0.86	0.25	0.13	0.82	0.041
KYU_19_A022	14.9	1010	130	0.0	0.52	0.01	0.00	0.00	0.02	
KYU_19_A023	1.49	6.01	15	0.0	0.06	0.49	0.00	0.13	0.00	
KYU_19_A024	3.47	96.2	15	0.0	0.09	0.31	0.00	0.52	0.01	
KYU_19_C001	5.11	45.1	75	0.0	0.15	1.75	0.00	0.12	0.01	
KYU_19_C002	15.6	94.6	57	0.0	0.12	0.52	0.00	0.01	0.01	
KYU_19_C003	229	335	1000	0.0	0.22	0.02	0.00	0.00	0.49	0.041
KYU_19_C004	261	395	1200	0.0	0.26	0.03	0.00	0.00	0.53	0.046
KYU_19_C005	997	54.1	55	0.0	2.33	0.02	0.00	0.00	2.92	0.15
KYU_19_C006	3.18	145	150	0.0	0.24	0.31	0.00	0.09	0.00	
KYU_19_C007	4.55	10.0	63	0.0	0.20	0.00	0.00	0.03	0.02	

Sample_ID	TotC	HCO_3^- *	CO_3^{2-} *	$\delta^{18}O$	δD	$\delta^{13}C\_DIC$	^4He	^{20}Ne	$^3He/^4He$	corrected $^3He/^4He$
	(mg/L)	(mg/L)	(mg/L)	(‰)	(‰)	(‰)	(cm^3STPgH_2O)			(Ra)
KYU_13_A024	82.4	405	8.31	-8.0	-51	-3.0	1.02E-06	1.48E-07	6.91E-07	0.474
KYU_13_A025	29.3	133	0.10	-8.4	-55	-10.4	1.87E-07	1.91E-07	3.98E-07	
KYU_13_F013	46.4	222	9.52	-7.7	-49	-15.0	3.66E-07	1.81E-07	4.08E-07	0.184
KYU_13_F015	512	2230	2.28	-7.1	-47	-9.8				
KYU_14_A001	417	523	0.02	-6.6	-41	-7.9				
KYU_14_E001	20.6	100	2.65	-8.4	-53	-4.5	2.03E-06	2.04E-07	2.27E-06	1.64
KYU_14_E003	13.5	66.4	0.17	-8.2	-53	-15.6				
KYU_14_E004	37.7	187	1.43	-8.8	-56	-3.4				
KYU_14_E005	817	3250	1.86	-9.0	-59	-6.7				
KYU_14_E006	290	1190	0.56	-8.5	-56	-6.2				
KYU_14_E007	658	2590	1.36	-9.0	-59	-6.8				
KYU_14_E008	391	1190	0.21	-9.4	-63	-7.3				
KYU_14_E009	4.69	22.9	0.58	-7.7	-62	-7.2				
KYU_14_E010	49.8	235	12.3	-8.7	-57	-6.6				
KYU_14_E012	25.2	114	9.97	-7.3	-56	-3.9				
KYU_14_E018	1.83	8.84	0.32	-8.2	-53	-11.0	7.73E-07	2.29E-07	8.77E-07	0.595
KYU_14_E019	48.5	240	3.57	-9.4	-65	-9.7				
KYU_14_E020	150	743	5.82	-9.6	-65	-9.0				
KYU_14_F002	103	432	0.33	-8.4	-57	-6.0	1.18E-07	6.47E-08	6.98E-06	5.66
KYU_14_F003	2.33	11.4	0.28	-6.7	-55	-3.4	9.10E-09	1.96E-08	1.49E-06	
KYU_14_F004	39.3	189	0.45	-8.6	-56	-7.1	7.45E-07	1.48E-07	5.27E-06	3.92
KYU_14_F005	137	600	0.60	-8.8	-57	-5.2	1.16E-06	7.01E-08	6.98E-06	5.05
KYU_14_F006	5.46	26.2	0.96	-7.0	-56	1.9	1.72E-08	4.35E-08	1.58E-06	
KYU_14_F007	219	1050	2.24	-9.7	-63	-5.3	4.21E-06	1.07E-07	3.38E-06	2.43
KYU_14_F008	49.8	240	9.00	-7.9	-51	-4.7	1.09E-07	1.37E-07	4.76E-07	
KYU_14_F009	93.0	448	16.1	-6.7	-48	-7.2	6.93E-06	1.92E-07	2.22E-06	1.59
KYU_14_F010	53.9	267	2.45	-6.9	-47	-7.0	2.71E-06	1.59E-07	1.96E-06	1.41
KYU_14_F011	82.1	399	1.44	-6.8	-48	-6.4	4.54E-06	1.40E-07	1.73E-06	1.24
KYU_14_F012	10.3	51.3	0.37	-7.6	-49	-13.5	1.96E-07	1.70E-07	1.17E-06	0.784
KYU_14_F013	68.9	341	2.90	-3.9	-52	-9.0	1.28E-05	1.22E-07	4.20E-06	3.01
KYU_14_F014	10.3	40.9	8.42	-7.4	-50	-15.7				
KYU_14_F015	26.3	129	2.49	-6.7	-43	-10.1	5.04E-07	1.91E-07	6.67E-07	0.418
KYU_14_F016	10.8	38.7	11.8	-7.7	-50	-9.7				
KYU_14_F017	99.6	481	1.22	-8.0	-53	-3.4	9.65E-08	1.33E-07	5.98E-06	
KYU_14_F018	13.9	68.8	1.03	-8.3	-55	-13.9	2.22E-07	1.79E-07	4.12E-07	0.103
KYU_14_F019	9.81	44.5	3.85	-8.2	-53	-14.6	1.40E-07	1.95E-07	6.14E-07	
KYU_15_E009	1250	5320	4.05	-10.0	-52	-2.6				
KYU_15_E010	582	649	0.02	-8.3	-46	-5.2				
KYU_15_E012	10.9	50.5	3.33	-8.2	-53	-10.0				
KYU_15_E017	166	813	2.57	-6.9	-52	-4.4	8.01E-07	5.22E-08	2.03E-06	1.46
KYU_16_A001	15.8	77.6	0.20	-7.8	-50	-17.6				
KYU_16_A002#	24.5	115	0.11	-7.1	-46	-17.3				
KYU_16_A003#	33.4	164	0.47	-7.2	-47	-15.7				
KYU_16_A004	48.4	229	0.27	-7.6	-48	-13.9				
KYU_16_A005	14.5	71.0	0.18	-8.1	-52	-10.9				
KYU_16_A006	7.30	36.0	0.10	-8.7	-55	-12.2				
KYU_16_A007	13.2	65.6	0.54	-7.9	-51	-9.5				
KYU_16_A008	20.3	101	0.58	-7.5	-50	-12.0				
KYU_16_A009	16.0	79.5	0.74	-7.7	-50	-10.3				
KYU_16_A010	14.4	70.2	1.99	-7.7	-50	-9.7				
KYU_16_A011	18.4	90.7	0.25	-7.4	-48	-12.4				
KYU_16_A012	11.5	57.2	0.58	-7.9	-51	-8.3				
KYU_16_A013	11.7	58.3	0.38	-8.0	-51	-8.9				
KYU_16_A014	17.9	88.7	0.49	-7.3	-48	-14.4				
KYU_16_A015	9.22	45.7	0.17	-8.2	-52	-7.0				
KYU_16_A016	8.98	44.7	0.44	-8.2	-53	-6.2				
KYU_16_A017	8.68	43.1	0.19	-8.3	-53	-5.3				
KYU_16_A018	13.5	67.0	0.57	-8.5	-55	-5.3				
KYU_16_A019	9.67	47.9	0.19	-8.5	-54	-5.0				
KYU_16_A020	6.51	32.3	0.13	-8.6	-54	-4.2				
KYU_16_A021	7.45	36.9	0.14	-8.4	-53	-4.6				
KYU_16_A022	9.23	45.5	0.13	-8.0	-51	-7.4				
KYU_16_A023	8.90	44.0	0.14	-8.2	-52	-4.7				
KYU_16_A024	10.7	52.1	0.10	-8.1	-52	-6.5				
KYU_16_A025	23.9	117	0.30	-7.2	-47	-13.0				
KYU_16_A026	21.7	106	0.20	-7.2	-46	-14.7				
KYU_16_A027	8.61	42.4	0.11	-8.0	-51	-9.5				
KYU_16_A028	8.51	41.4	0.07	-8.7	-56	-15.4				
KYU_16_A029	10.8	49.1	0.03	-8.7	-56	-13.1				
KYU_16_A030	12.8	56.2	0.03	-8.4	-55	-18.7				

Sample_ID	TotC	HCO_3^- *	CO_3^{2-} *	$\delta^{18}O$	δD	$\delta^{13}C\_DIC$	^4He	^{20}Ne	$^3He/^4He$	corrected $^3He/^4He$
	(mg/L)	(mg/L)	(mg/L)	(‰)	(‰)	(‰)	(cm^3STPgH_2O)			(Ra)
KYU_16_A031	8.36	41.0	0.10	-7.5	-48	-18.9	4.52E-08	1.70E-07	1.40E-06	
KYU_16_A032	14.9	73.5	0.27	-7.5	-49	-16.7	6.02E-08	2.32E-07	1.52E-06	
KYU_16_A033	20.1	54.5	0.01	-6.9	-48	-20.2				
KYU_16_A034	10.9	37.7	0.01	-7.0	-48	-19.8				
KYU_16_A035	10.4	43.1	0.02	-7.3	-50	-19.9				
KYU_16_A036	16.5	71.4	0.03	-7.2	-49	-18.3				
KYU_16_A037	15.3	64.3	0.02	-7.3	-49	-17.2				
KYU_16_B001	40.4	192	0.23	-7.9	-51	-13.8	1.11E-07	1.81E-07	1.51E-06	
KYU_16_B002	32.1	142	0.08	-7.4	-49	-15.6	4.88E-08	1.71E-07	1.53E-06	
KYU_16_B003	13.9	55.0	0.01	-7.8	-52	-17.0	4.33E-08	1.68E-07	1.39E-06	
KYU_16_B004#	17.6	72.9	0.03	-7.4	-49	-17.2	8.32E-08	1.84E-07	2.88E-06	
KYU_16_B005	19.6	94.3	0.13	-8.3	-55	-6.9				
KYU_16_B006	13.7	68.0	0.28	-7.8	-51	-8.4				
KYU_16_B007	9.46	46.4	0.11	-8.7	-56	-5.3				
KYU_16_B008	8.66	42.0	0.07	-8.3	-54	-5.8				
KYU_16_B009	12.3	58.8	0.08	-8.8	-57	-2.7				
KYU_16_B010	6.15	30.6	0.17	-8.9	-57	-4.0				
KYU_16_B011	6.86	34.2	0.30	-8.8	-57	-4.6				
KYU_16_B012	8.89	42.8	0.06	-8.6	-56	-6.0				
KYU_16_B013	7.71	36.1	0.03	-8.8	-57	-3.9				
KYU_16_B014	8.19	39.9	0.07	-8.7	-57	-2.7				
KYU_16_B015	9.90	47.6	0.07	-7.7	-50	-11.8				
KYU_16_B016	10.7	51.4	0.07	-7.6	-50	-10.8				
KYU_16_B017	10.8	52.2	0.09	-7.6	-49	-9.8				
KYU_16_B018	12.3	61.1	0.34	-7.8	-50	-8.4				
KYU_16_B019	16.6	80.6	0.14	-7.7	-49	-8.4				
KYU_16_B020	16.8	83.6	0.58	-7.6	-49	-8.3				
KYU_16_B021	16.6	81.4	0.19	-7.9	-51	-11.6				
KYU_16_B022	16.4	81.1	0.27	-7.8	-50	-8.7				
KYU_16_B023	12.3	60.1	0.13	-7.8	-50	-7.8				
KYU_16_B024	11.1	55.0	0.35	-7.9	-50	-7.8				
KYU_16_B025	12.2	60.3	0.17	-7.5	-49	-13.5				
KYU_16_B026	12.0	59.1	0.16	-7.5	-49	-11.3				
KYU_16_B027	15.7	78.2	0.44	-7.8	-51	-11.1				
KYU_16_B028	13.0	62.8	0.10	-8.4	-55	-18.0	4.25E-08	1.68E-07	1.43E-06	
KYU_16_B029	10.8	47.7	0.02	-8.3	-55	-18.5				
KYU_16_B030	17.5	75.8	0.04	-7.5	-49	-16.9				
KYU_16_B031#	31.7	115	0.02	-7.2	-47	-21.7	4.35E-08	1.65E-07	1.41E-06	
KYU_16_B032#	8.79	34.8	0.01	-8.3	-53	-14.2	4.38E-08	1.71E-07	1.34E-06	
KYU_16_B033#	11.3	41.9	0.01	-7.5	-48	-16.1	4.38E-08	1.68E-07	1.47E-06	
KYU_16_B034#	8.49	39.8	0.04	-8.1	-51	-14.8	4.61E-08	1.80E-07	1.60E-06	
KYU_16_B035	8.16	37.6	0.03	-7.8	-50	-13.4				
KYU_16_J001$	11.8	58.6	0.56	-7.2	-46	-20.6	5.59E-08	2.10E-07	1.56E-06	
KYU_16_J002	43.3	206	10.0	-7.4	-49	-15.8	3.62E-07	1.84E-07	4.05E-07	0.179
KYU_16_J005	11.7	54.5	3.56	-7.2	-46	-12.4	6.32E-08	2.07E-07	1.62E-06	
KYU_16_J006	67.7	334	2.23	-3.8	-52	-10.1	2.80E-05	7.42E-08	4.39E-06	3.13
KYU_16_J007#	9.03	44.9	0.29	-8.0	-51	-14.9	5.04E-08	1.89E-07	1.70E-06	
KYU_16_J008	17.1	83.3	0.49	-1.7	-37	-13.3	7.60E-06	1.36E-08	4.50E-06	3.22
KYU_16_J009#	18.3	89.5	0.21	-7.3	-48	-17.4	8.55E-08	1.83E-07	3.04E-06	
KYU_16_J010	39.9	195	0.95	-4.3	-42	-1.7	4.14E-06	2.45E-08	6.43E-06	4.60
KYU_16_J011	13.7	65.5	0.20	-5.2	-35	-17.0	1.56E-06	1.60E-07	6.14E-06	4.48
KYU_16_J012#	29.3	145	0.45	-7.1	-46	-15.3	5.93E-08	2.08E-07	1.46E-06	
KYU_16_J013	13.2	53.4	9.73	-7.7	-51	-11.1	3.04E-06	1.63E-07	3.25E-06	2.34
KYU_16_J014#	27.8	130	0.12	-7.1	-47	-20.9	4.27E-08	1.36E-07	1.46E-06	
KYU_16_J015	41.4	206	1.50	-7.5	-49	-7.8	5.90E-07	1.80E-07	4.60E-06	3.49
KYU_16_J016	60.4	299	2.80	-6.9	-48	-7.0	3.01E-06	1.57E-07	2.12E-06	1.52
KYU_16_J017	84.0	411	1.81	-6.8	-48	-6.3	4.98E-06	1.78E-07	1.83E-06	1.31
KYU_16_J018	6.90	31.7	0.06	-5.0	-33	-10.1	4.54E-06	7.99E-08	6.39E-06	4.58
KYU_16_J019	542	667	0.02	-6.8	-43	-8.6				
KYU_16_J020	890	3970	5.68	-5.7	-44	-4.8				
KYU_16_J021	137	674	3.08	-7.6	-49	-7.7	1.79E-06	2.06E-07	4.15E-06	3.03
KYU_16_J022$				-7.3	-46					
KYU_16_J023#				-7.2	-46					
KYU_16_J024#	24.6	84.2	0.01	-7.0	-45	-17.3				
KYU_16_J025	72.0	352	9.18	-8.2	-54	-6.9	1.26E-07	1.41E-07	2.32E-06	
KYU_16_J026#				-7.4	-48					
KYU_16_J027#	11.3	55.4	0.16	-7.6	-48	-16.0	4.61E-08	1.76E-07	1.39E-06	
KYU_16_J028#				-8.1	-51					
KYU_16_J029	228	1080	1.92	-9.8	-64	-5.7	3.29E-06	7.24E-08	3.87E-06	2.78
KYU_16_J030#	12.5	53.1	0.02	-8.5	-54	-10.6	5.18E-08	1.97E-07	1.54E-06	

Sample_ID	TotC	HCO_3^- *	CO_3^{2-} *	$\delta^{18}O$	δD	$\delta^{13}C\_DIC$	^4He	^{20}Ne	$^3He/^4He$	corrected $^3He/^4He$
	(mg/L)	(mg/L)	(mg/L)	(‰)	(‰)	(‰)	($cm^3STPg H_2O$)			(Ra)
KYU_16_J031	43.3	207	8.88	-8.9	-57	-6.0	8.74E-08	1.46E-07	7.76E-07	
KYU_16_J032				-8.6	-55					
KYU_16_J033#	9.01	44.7	0.18	-8.4	-53	-14.2	4.71E-08	1.78E-07	1.50E-06	
KYU_16_J034	10.6	44.5	6.82	-8.7	-57	-10.4	6.94E-07	1.80E-07	1.72E-07	0.0581
KYU_16_J035	9.76	46.2	2.36	-8.1	-52	-15.1	5.16E-07	3.38E-07	3.35E-07	0.0801
KYU_16_J039$	26.5	101	0.03	-8.6	-55	-6.6	2.26E-07	1.74E-07	6.57E-06	5.63
KYU_16_J040	47.8	211	0.19	-8.4	-55	-7.3	1.22E-06	1.88E-07	5.35E-06	3.94
KYU_16_J041#	11.7	55.1	0.06	-8.5	-55	-11.2				
KYU_16_J042	26.9	132	0.48	-8.0	-56	-8.5				
KYU_16_J043	20.9	99.2	0.16	-8.2	-53	-10.8	3.92E-07	1.74E-07	4.69E-06	3.67
KYU_16_J044	9.93	44.2	0.03	-6.9	-47	-12.9				
KYU_16_J045	7.13	32.3	0.02	-7.9	-50	-14.5				
KYU_16_J046	4.70	22.7	0.03	-8.1	-51	-7.9				
KYU_16_J047#	8.47	39.9	0.04	-8.0	-51	-14.9				
KYU_16_J048#	11.1	42.5	0.01	-7.5	-48	-16.0				
KYU_16_J049#	17.5	74.7	0.03	-7.3	-48	-17.2				
KYU_16_J050#	11.7	58.0	0.95	-7.7	-48	-16.4	4.70E-08	1.69E-07	1.28E-06	
KYU_16_J051#	8.59	42.8	0.33	-8.1	-51	-15.1	5.29E-08	1.94E-07	1.40E-06	
KYU_16_J052#	9.25	45.7	0.15	-8.4	-52	-14.3	5.03E-08	1.81E-07	1.41E-06	
KYU_16_J053#	17.4	82.5	0.10	-7.5	-48	-17.1	8.99E-08	1.97E-07	2.98E-06	
KYU_16_J054#	28.7	142	0.82	-7.4	-46	-15.4	6.17E-08	2.14E-07	1.41E-06	
KYU_16_J055#	24.9	121	0.23	-7.2	-45	-17.2	7.26E-08	2.22E-07	2.08E-06	
KYU_16_J056$	11.2	54.2	0.08	-7.4	-46	-20.5	3.54E-08	1.50E-07	1.65E-06	
KYU_16_J057#	32.0	147	0.12	-7.4	-47	-21.8				
KYU_16_J058$	27.4	124	0.12	-8.6	-55	-6.6	3.11E-07	1.86E-07	6.80E-06	5.58
KYU_16_J059	134	612	0.73	-8.8	-57	-3.9	2.92E-07	1.21E-07	4.80E-06	3.73
KYU_16_J060$	24.0	107	0.08	-8.5	-54	-4.8	5.81E-08	1.95E-07	2.97E-06	
KYU_16_J061	26.4	97.0	0.02	-8.7	-55	-4.2				
KYU_16_J062	61.1	273	0.32	-8.6	-56	-5.5	5.23E-07	1.07E-07	9.70E-06	7.27
KYU_16_J063	26.5	128	0.24	-8.9	-56	-6.6	2.09E-07	2.06E-07	8.82E-06	8.17
KYU_16_J064	46.1	204	0.19	-8.4	-55	-7.2	1.25E-06	2.01E-07	5.84E-06	4.31
KYU_16_J065	40.6	195	8.18	-8.9	-56	-6.0				
KYU_16_J066	67.0	331	5.26	-9.4	-61	-5.8	1.74E-06	3.45E-07	2.13E-06	1.55
KYU_16_J067#	11.1	54.8	0.18	-8.6	-55	-9.9	4.71E-08	1.83E-07	1.43E-06	
KYU_16_J068	190	898	1.69	-8.7	-56	-5.7	3.14E-07	1.09E-07	7.57E-06	5.85
KYU_16_J069	227	1070	1.43	-9.8	-64	-5.6	7.18E-06	1.33E-07	3.59E-06	2.57
KYU_16_J070	97.9	464	0.82	-8.6	-55	-5.7				
KYU_16_J071	49.8	235	0.44	-8.5	-56	-7.8	7.75E-07	1.63E-07	5.24E-06	3.91
KYU_16_J072	38.9	188	0.47	-8.5	-52	-7.9	5.59E-07	1.79E-07	6.49E-06	4.97
KYU_16_J073	45.7	214	0.30	-8.5	-55	-10.0	6.63E-07	1.77E-07	5.41E-06	4.08
KYU_16_J074	45.7	206	0.22	-8.5	-56	-7.0	8.94E-07	1.40E-07	5.34E-06	3.94
KYU_16_J075#	10.7	52.8	0.19	-8.6	-55	-11.0				
KYU_16_J076	112	527	1.09	-8.9	-57	-4.5	2.74E-07	1.17E-07	6.58E-06	5.17
KYU_16_J077	104	517	5.15	-9.4	-63	-7.9	1.09E-06	1.44E-07	3.54E-06	2.58
KYU_16_J078	137	643	0.95	-9.1	-59	-10.1	1.50E-06	1.33E-07	9.11E-06	6.64
KYU_16_J079	90.7	442	1.35	-9.3	-61	-8.8	1.03E-06	6.51E-08	9.67E-06	7.01
KYU_16_J080	9.05	44.8	0.17	-8.7	-56	-15.9	4.58E-08	1.80E-07	1.49E-06	
KYU_16_J081	10.2	50.2	0.14	-8.8	-56	-12.8				
KYU_16_K001	28.2	140	0.65	-7.8	-52	-15.5				
KYU_16_K002	15.8	77.2	0.17	-8.3	-54	-11.8				
KYU_16_K003	19.4	96.2	0.39	-8.2	-53	-12.5				
KYU_16_K004	20.4	101	0.47	-8.1	-53	-12.3				
KYU_16_K005	22.0	109	0.44	-8.1	-52	-12.4				
KYU_16_K006	10.9	52.8	0.10	-8.2	-52	-11.3				
KYU_16_K007	15.6	70.6	0.05	-8.2	-52	-11.8				
KYU_16_K008	8.72	41.6	0.06	-8.2	-53	-8.8				
KYU_16_K009	10.7	50.5	0.06	-7.8	-50	-11.5	4.15E-08	1.58E-07	1.47E-06	
KYU_16_K010	8.49	38.9	0.04	-8.2	-53	-8.3	4.16E-08	1.59E-07	1.55E-06	
KYU_16_K011	13.1	61.8	0.07	-8.2	-52	-11.3	4.27E-08	1.61E-07	1.52E-06	
KYU_16_K012	12.2	58.4	2.71	-8.1	-52	-11.4				
KYU_16_K013	14.8	73.2	0.29	-8.2	-53	-11.6				
KYU_16_K014	12.2	60.0	0.16	-8.4	-54	-11.5				
KYU_16_K015	15.1	74.1	0.21	-8.4	-53	-11.3				
KYU_16_K016	14.1	69.1	0.17	-8.3	-53	-12.0				
KYU_16_K017	14.4	68.8	0.09	-8.3	-53	-12.3				
KYU_16_K018	14.5	69.4	0.10	-8.2	-52	-11.8				
KYU_16_K019	15.0	72.3	0.13	-8.0	-51	-11.2				
KYU_16_K020	16.1	78.6	0.16	-8.1	-52	-13.2				
KYU_16_K021	9.80	47.4	0.08	-8.1	-51	-13.7				
KYU_16_K022	10.6	50.9	0.08	-8.0	-51	-9.0				

Sample_ID	TotC	HCO_3^- *	CO_3^{2-} *	$\delta^{18}O$	δD	$\delta^{13}C\_DIC$	^4He	^{20}Ne	$^3He/^4He$	corrected $^3He/^4He$
	(mg/L)	(mg/L)	(mg/L)	(‰)	(‰)	(‰)	($cm^3STPg H_2O$)			(Ra)
KYU_16_K023	14.5	69.5	0.10	-8.1	-51	-12.6				
KYU_16_K024	15.6	75.3	0.12	-8.1	-51	-12.8				
KYU_16_K025	14.2	66.6	0.07	-8.1	-51	-12.6				
KYU_16_K026	14.1	68.0	0.11	-8.0	-51	-12.3				
KYU_16_K027	8.73	41.3	0.05	-8.0	-51	-10.2				
KYU_16_K028	13.8	64.9	0.07	-8.1	-51	-12.3				
KYU_16_K029	13.7	63.6	0.06	-8.0	-51	-12.2				
KYU_16_K030	9.06	42.2	0.04	-7.7	-50	-12.3				
KYU_16_K031	11.8	54.5	0.04	-8.1	-52	-10.6				
KYU_16_K032	23.0	103	0.06	-8.2	-53	-17.4	4.79E-08	1.85E-07	1.50E-06	
KYU_16_K033	12.7	46.1	0.01	-8.4	-53	-15.7				
KYU_16_K034	19.0	64.6	0.01	-8.3	-54	-15.2				
KYU_16_K035	19.7	41.6	0.00	-8.2	-53	-16.3	7.19E-08	2.68E-07	1.59E-06	
KYU_16_K036	20.8	50.2	0.00	-8.3	-54	-16.0				
KYU_16_K037	15.9	73.4	0.06	-8.6	-54	-15.4	4.25E-08	1.72E-07	1.40E-06	
KYU_16_K038	17.4	51.2	0.01	-8.5	-54	-10.4				
KYU_16_K039	12.9	45.3	0.01	-8.5	-55	-12.6				
KYU_16_K040	14.2	49.0	0.01	-8.4	-54	-15.4	5.32E-08	2.02E-07	1.48E-06	
KYU_16_K041	21.6	75.5	0.01	-7.9	-52	-17.6				
KYU_16_K042	5.47	26.6	0.05	-8.4	-54	-8.6				
ASO_16_K018	11.6	13.7	0.00	-8.5	-53	-5.7	6.15E-08	2.22E-07	1.73E-06	
ASO_16_K019	18.1	22.0	0.00	-8.6	-54	-5.1	5.14E-08	1.78E-07	2.09E-06	
ASO_16_K020	14.3	47.8	0.01	-8.6	-55	-9.2	5.79E-08	2.03E-07	2.11E-06	
KYU_16_J082#	23.5	99.0	0.04	-7.1	-45	-16.8	7.44E-08	2.25E-07	2.18E-06	
KYU_16_J083#	28.9	136	0.14	-7.2	-46	-15.2	5.83E-08	2.03E-07	1.40E-06	
KYU_16_J084$	11.3	52.4	0.05	-7.2	-46	-20.4	5.73E-08	2.24E-07	1.62E-06	
KYU_16_J085#	17.7	75.0	0.03	-7.4	-48	-17.1	8.73E-08	1.96E-07	2.95E-06	
KYU_16_J086#	11.2	51.0	0.03	-7.5	-49	-15.8				
KYU_16_J087#	8.56	40.1	0.04	-8.0	-51	-15.2	5.22E-08	2.06E-07	1.55E-06	
KYU_16_J088#	8.94	40.6	0.03	-8.3	-52	-14.4	1.23E-07	4.23E-07	1.41E-06	
KYU_16_J089$	28.6	104	0.03	-8.5	-55	-7.2	2.71E-07	1.73E-07	6.76E-06	5.60
KYU_16_J090$	26.8	92.3	0.02	-8.4	-54	-5.4	5.45E-08	1.90E-07	2.47E-06	
KYU_16_L007	21.5	89.6	0.03	-8.0	-52	-12.8				
KYU_16_L008	12.6	57.6	0.04	-8.1	-52	-11.3				
KYU_16_L009	16.2	75.4	0.06	-8.1	-52	-12.0				
KYU_16_L010	15.8	75.1	0.09	-8.1	-52	-12.0				
KYU_16_L011	15.9	74.7	0.08	-8.1	-52	-12.1				
KYU_16_L012	15.6	71.6	0.05	-8.0	-52	-11.8				
KYU_16_L013	13.6	60.9	0.04	-8.0	-52	-11.3				
KYU_16_L014	14.3	61.4	0.03	-8.0	-52	-11.3				
KYU_16_L015	14.3	63.2	0.04	-8.0	-52	-11.3				
KYU_16_L016	13.8	50.2	0.01	-8.0	-52	-11.2				
KYU_16_L017	13.8	59.8	0.03	-8.0	-52	-11.2				
KYU_16_L018	14.0	60.7	0.03	-8.0	-52	-11.2				
KYU_16_L019	11.6	52.6	0.03	-8.1	-52	-9.4				
KYU_16_L020	9.93	41.0	0.01	-7.9	-51	-10.9				
KYU_16_L021	8.10	34.7	0.01	-7.9	-51	-9.2				
KYU_16_L022	12.7	54.8	0.03	-7.9	-51	-8.5				
KYU_16_L023	13.1	59.1	0.04	-7.7	-49	-12.4				
KYU_16_L024	10.9	45.2	0.02	-7.7	-50	-10.9				
KYU_16_L025	8.42	32.0	0.01	-8.1	-52	-8.8				
KYU_16_L026	10.2	47.2	0.04	-7.9	-51	-12.0				
KYU_16_L027	16.4	72.9	0.05	-7.9	-51	-11.3				
KYU_16_L028	14.1	64.5	0.05	-8.2	-54	-12.0				
KYU_16_L029	12.9	54.6	0.02	-8.3	-54	-11.7				
KYU_16_L030	16.2	72.9	0.05	-8.2	-54	-12.0				
KYU_16_L031	13.0	56.6	0.03	-8.2	-54	-11.5				
KYU_16_L032	10.6	49.6	0.04	-8.1	-52	-11.0				
KYU_16_L033	19.8	90.3	0.06	-8.1	-52	-12.3				
KYU_16_L034	22.3	104	0.09	-7.9	-53	-12.1				
KYU_16_L035	14.4	67.3	0.06	-7.3	-48	-17.1	1.26E-07	2.01E-07	3.35E-06	
KYU_16_K043	10.2	50.0	0.12	-8.3	-54	-11.4				
KYU_16_K044	12.1	60.0	0.22	-8.3	-53	-12.3				
KYU_16_K045	11.5	55.1	0.08	-8.3	-53	-11.0				
KYU_16_K046	11.6	55.4	0.08	-8.2	-53	-10.8				
KYU_16_K047	11.7	56.4	0.09	-8.2	-53	-10.6				
KYU_16_K048	13.5	65.8	0.14	-8.2	-53	-9.5				
KYU_16_K049	13.1	62.1	0.07	-8.2	-53	-9.7				
KYU_16_K050	14.0	69.3	0.26	-8.2	-53	-9.3				
KYU_16_K051	16.7	81.4	0.16	-7.8	-52	-15.8				

Sample_ID	TotC	HCO_3^- *	CO_3^{2-} *	$\delta^{18}O$	δD	$\delta^{13}C\_DIC$	^4He	^{20}Ne	$^3He/^4He$	corrected $^3He/^4He$
	(mg/L)	(mg/L)	(mg/L)	(‰)	(‰)	(‰)	($cm^3STPg H_2O$)			(Ra)
KYU_16_K052	11.4	55.5	0.12	-8.4	-54	-12.6				
KYU_16_K053	9.43	46.0	0.10	-8.4	-54	-11.4				
KYU_16_K054	13.9	68.0	0.16	-8.3	-54	-13.8				
KYU_16_K055	24.1	101	0.04	-8.2	-54	-17.5				
KYU_16_K056	12.0	56.2	0.05	-8.2	-54	-12.0				
KYU_16_K057	8.79	41.3	0.04	-8.2	-53	-8.7				
KYU_16_K058	12.1	55.8	0.04	-8.2	-54	-7.1				
KYU_16_K059	8.45	35.0	0.01	-8.3	-54	-7.9				
KYU_16_K060	12.5	59.3	0.07	-8.1	-53	-14.0				
KYU_16_K061	12.4	60.0	0.10	-8.1	-52	-14.0				
KYU_16_K062	12.4	60.3	0.12	-8.2	-52	-12.3				
KYU_16_K063	11.9	58.5	0.14	-8.1	-52	-11.2				
KYU_16_K064	11.9	58.6	0.14	-8.1	-52	-11.4				
KYU_16_K065	11.6	56.3	0.11	-8.1	-52	-14.1				
KYU_16_K066	11.9	58.4	0.15	-8.1	-52	-11.5				
KYU_16_K067	16.6	78.2	0.09	-8.2	-53	-8.5				
KYU_16_K068	34.4	159	0.14	-8.1	-52	-9.2				
KYU_16_K069	9.02	39.4	0.02	-8.3	-53	-4.1				
ASO_16_K025	9.83	33.8	0.01	-8.4	-54	-5.3	5.17E-08	1.91E-07	1.77E-06	
ASO_16_K027	18.7	22.7	0.00	-8.6	-55	-5.2	5.89E-08	2.09E-07	2.10E-06	
ASO_16_K028	11.7	15.8	0.00	-8.4	-54	-5.6	5.03E-08	1.97E-07	2.16E-06	
ASO_16_K029	11.7	36.5	0.00	-7.8	-51	-12.7				
ASO_16_K030	11.0	8.65	0.00	-8.3	-54	-7.8				
ASO_16_K031	13.0	43.8	0.01	-7.7	-51	-15.3				
ASO_16_K032	11.2	29.6	0.00	-8.2	-53	-12.0				
ASO_17_K001	40.5	171	0.10	-8.5	-54	-6.3	5.02E-07	2.15E-07	7.22E-06	5.69
ASO_17_K002	29.0	126	0.08	-8.6	-55	-6.3	3.16E-07	2.10E-07	7.71E-06	6.47
ASO_17_K003	11.6	50.7	0.03	-8.8	-56	-8.0				
ASO_17_K004	17.7	31.4	0.00	-8.6	-55	-4.9				
ASO_17_K005	22.5	31.9	0.00	-8.8	-56	-5.2				
ASO_17_K006	13.3	45.7	0.01	-7.7	-50	-15.5				
ASO_17_K007	12.3	37.3	0.01	-8.7	-56	-8.7	7.93E-08	2.02E-07	4.16E-06	
ASO_17_K008	20.1	61.1	0.01	-8.6	-55	-4.2				
ASO_17_K009	15.6	27.4	0.00	-8.8	-56	-3.0				
ASO_17_K010	11.8	7.26	0.00	-8.6	-55	-3.7				
ASO_17_K012	22.2	58.5	0.01	-7.9	-51	-13.9				
ASO_17_K013	21.2	70.7	0.02	-8.4	-55	-5.7	1.26E-07	1.99E-07	5.94E-06	
ASO_17_K014	11.4	29.0	0.00	-8.5	-54	-5.1				
ASO_17_K015	5.68	20.5	0.00	-8.4	-54	0.1				
ASO_17_K016	22.8	24.0	0.00	-7.7	-49	-17.6				
ASO_17_K017	5.75	18.4	0.00	-8.2	-52	-6.8				
ASO_17_K018	22.1	77.3	0.02	-8.4	-55	-5.9	1.15E-07	1.94E-07	5.69E-06	
ASO_17_K019	5.03	20.4	0.01	-8.0	-50	-5.9	4.08E-08	1.59E-07	1.28E-06	
ASO_17_K020	62.8	297	0.59	-8.5	-56	-6.2	1.25E-06	1.96E-07	6.63E-06	4.90
ASO_17_K021	381	1340	0.36	-9.4	-63	-7.1				
ASO_17_K022	4.56	22.6	0.27	-8.5	-54	-8.1				
KYU_17_J091$	26.6	110	0.05	-8.5	-54	-5.4	6.11E-08	2.00E-07	2.59E-06	
KYU_17_J092$	28.6	118	0.06	-8.5	-56	-7.4	2.81E-07	1.85E-07	6.54E-06	5.45
KYU_17_J093#	11.2	51.2	0.04	-7.5	-49	-16.1	4.66E-08	1.77E-07	1.45E-06	
KYU_17_J094#	8.59	42.6	0.17	-8.0	-51	-15.5	5.44E-08	2.05E-07	1.61E-06	
KYU_17_J095#	9.01	44.3	0.12	-8.3	-53	-14.5				
KYU_17_J096#	16.9	77.6	0.06	-7.3	-48	-17.3	8.38E-08	1.96E-07	2.82E-06	
KYU_17_J097$	10.8	53.2	0.14	-7.2	-46	-20.6				
KYU_17_J098#	23.8	108	0.08	-7.0	-46	-17.3				
KYU_17_J099#	31.8	156	0.41	-7.2	-46	-16.0				
KYU_17_J100#	11.3	44.5	0.01	-8.5	-54	-10.4				
KYU_17_J101#	11.0	49.8	0.03	-8.5	-55	-12.0				
ASO_17_K023	5.03	23.4	0.02	-8.1	-51	-9.4				
ASO_17_K024	22.5	92.7	0.05	-8.4	-55	-6.1	9.81E-08	1.69E-07	5.73E-06	
ASO_17_K025	69.1	334	0.95	-8.5	-56	-7.0	2.97E-07	1.50E-07	6.00E-06	4.79
ASO_17_K026	5.00	24.7	0.07	-7.9	-50	-7.4	4.18E-08	1.62E-07	1.38E-06	
ASO_17_K027	390	1480	0.54	-9.4	-63	-7.6				
ASO_17_K028	4.69	22.1	0.02	-8.5	-54	-9.9				
KYU_17_T001				-6.0	-38					
ASO_17_K029	396	1330	0.33	-9.5	-63	-7.6				
ASO_17_K030	64.9	293	0.34	-8.6	-56	-6.6	1.92E-07	1.37E-07	5.60E-06	4.70
ASO_17_K031	5.50	27.1	0.07	-8.1	-51	-10.9	4.36E-08	1.63E-07	1.35E-06	
ASO_17_K032	5.96	20.5	0.00	-8.3	-53	-12.4				
ASO_17_K033	6.53	23.6	0.00	-8.4	-52	-12.5				
ASO_17_K034	22.9	89.2	0.04	-8.5	-55	-6.5	1.50E-07	2.08E-07	6.24E-06	

Sample_ID	TotC	HCO_3^- *	CO_3^{2-} *	$\delta^{18}O$	δD	$\delta^{13}C\_DIC$	^4He	^{20}Ne	$^3He/^4He$	corrected $^3He/^4He$
	(mg/L)	(mg/L)	(mg/L)	(‰)	(‰)	(‰)	($cm^3STPg H_2O$)			(Ra)
KYU_17_A003	1380	5470	3.89	0.0	-41	-3.2				
KYU_17_A005	4.70	23.0	0.54	-7.8	-62	-7.5				
KYU_17_A006	144	623	0.56	-8.2	-58	-6.6	1.65E-08	9.32E-09	7.47E-06	6.10
KYU_17_A007	104	423	0.23	-8.3	-57	-7.4	2.11E-07	1.02E-07	8.08E-06	6.46
KYU_17_A008	90.7	348	0.12	-8.3	-56	-7.2	5.94E-08	1.24E-07	4.35E-06	
KYU_17_A009	14.4	69.1	0.09	-7.3	-48	-17.2				
KYU_17_A010#	17.6	80.8	0.06	-7.3	-48	-17.4				
KYU_17_A011	11.5	54.6	0.06	-7.2	-46	-20.7				
KYU_17_A012	7.01	33.4	0.11	-5.0	-33	-10.1				
KYU_17_A013	528	2340	2.77	-6.9	-47	-10.0				
KYU_17_A014	69.1	340	1.69	-3.8	-52	-9.3	2.93E-05	1.57E-07	4.06E-06	2.90
KYU_17_A015	58.6	290	1.99	-6.9	-48	-7.3				
KYU_17_A016	81.8	399	1.59	-6.8	-48	-6.7				
KYU_17_A017	16.1	78.8	0.46	-1.8	-37	-13.3	7.63E-06	1.18E-08	4.37E-06	3.12
KYU_17_A018	71.5	351	7.21	-8.1	-54	-6.9	4.90E-06	1.42E-07	2.66E-06	1.90
KYU_17_A019#	24.6	114	0.10	-7.1	-45	-17.5				
KYU_17_A020	38.7	185	0.51	-4.0	-41	-1.9	1.85E-06	8.35E-08	6.48E-06	4.67
KYU_17_A021	221	1080	3.32	-9.7	-64	-5.6				
KYU_17_A022	79.1	372	0.59	-8.9	-57	-5.2	4.33E-07	1.01E-07	8.06E-06	6.07
KYU_17_A023	27.6	122	0.09	-8.5	-56	-7.2				
KYU_17_A024	25.5	105	0.04	-8.4	-54	-5.1	5.55E-08	1.93E-07	2.60E-06	
KYU_17_A025	49.9	232	0.34	-8.4	-56	-7.7	2.37E-07	1.32E-07	4.79E-06	3.84
ASO_17_K035	12.5	13.0	0.00	-8.4	-54	-6.0				
ASO_17_K036	17.0	22.1	0.00	-8.5	-55	-5.4				
ASO_17_K037	18.0	21.7	0.00	-8.7	-57	-4.8				
ASO_17_K039	12.6	45.7	0.01	-7.9	-52	-15.6				
ASO_17_K040	7.41	26.9	0.00	-8.3	-52	-11.3				
ASO_17_K041	19.2	74.9	0.03	-8.4	-55	-5.6	1.22E-07	2.00E-07	5.92E-06	
ASO_17_K042	320	1190	0.40	-9.5	-63	-7.3				
ASO_17_K043	5.54	26.0	0.02	-8.5	-53	-9.1				
ASO_17_K044	65.7	301	0.39	-8.6	-56	-6.5	2.45E-07	1.42E-07	5.65E-06	4.58
ASO_17_K045	5.29	24.5	0.02	-8.0	-51	-8.8	4.29E-08	1.64E-07	1.42E-06	
KYU_17_B001	12.0	59.5	0.31	-7.3	-46	-8.9				
KYU_17_B002	8.19	40.6	0.17	-7.6	-49	-8.6				
KYU_17_B003	8.73	39.0	0.02	-7.9	-50	-6.3				
KYU_17_B004	6.57	31.2	0.03	-8.3	-55	-7.8				
KYU_17_B005	10.9	46.9	0.02	-8.1	-51	-5.9				
KYU_17_B006	7.46	33.4	0.02	-8.1	-52	-7.0				
KYU_17_B007	5.20	20.6	0.01	-8.6	-57	-7.7				
KYU_17_B008	7.93	29.1	0.01	-8.5	-55	-9.8				
KYU_17_B009	9.10	29.0	0.00	-8.2	-54	-8.2				
KYU_17_B010	6.63	33.0	0.26	-8.0	-52	-6.7				
KYU_17_B011	8.68	42.6	0.10	-8.0	-52	-7.8				
KYU_17_B012	8.87	43.6	0.11	-7.8	-50	-6.4				
KYU_17_B013	16.9	80.8	0.10	-7.1	-46	-11.6				
KYU_17_B014	18.5	86.4	0.08	-7.7	-49	-8.3				
KYU_17_B015	14.2	69.7	0.15	-7.8	-50	-8.0				
KYU_17_B016	15.3	71.1	0.06	-8.8	-56	-3.3				
KYU_17_B017	10.9	47.0	0.02	-8.9	-57	-3.1				
KYU_17_B018	8.90	43.6	0.09	-8.1	-52	-7.9				
KYU_17_B019	12.7	61.4	0.09	-8.6	-56	-10.7				
KYU_17_B020	12.4	57.9	0.05	-8.5	-55	-11.0				
KYU_17_B021	12.6	60.5	0.08	-8.5	-55	-11.9				
KYU_17_B022	10.9	53.8	0.20	-8.4	-54	-7.8				
KYU_17_B023	10.3	50.7	0.14	-8.3	-54	-6.7				
KYU_17_B024	8.64	42.4	0.10	-8.3	-53	-7.8				
KYU_17_B025	8.90	36.3	0.01	-8.2	-53	-8.4				
KYU_17_B026	7.07	32.9	0.03	-8.4	-54	-6.7				
KYU_17_B027	8.09	38.4	0.04	-8.9	-56	-5.9				
KYU_17_B028	7.86	38.6	0.09	-8.3	-53	-6.1				
KYU_17_B029	10.2	45.2	0.02	-8.1	-53	-9.6				
KYU_17_B030	10.3	49.2	0.06	-8.9	-57	-8.1				
KYU_17_B031	9.09	42.0	0.03	-8.1	-52	-10.3				
KYU_17_B032	7.57	35.9	0.04	-8.2	-52	-8.7				
KYU_17_B033	7.54	35.3	0.03	-8.3	-52	-7.9				
KYU_17_B034	9.57	44.6	0.04	-8.1	-52	-10.9				
KYU_17_B035	8.39	24.4	0.00	-8.2	-52	-9.4				
KYU_17_B036	11.6	55.9	0.08	-8.3	-54	-14.4				
KYU_17_B037	6.73	33.0	0.07	-8.5	-55	-8.2				
KYU_17_B038	9.18	45.3	0.12	-8.3	-54	-10.7				

Sample_ID	TotC	HCO_3^- *	CO_3^{2-} *	$\delta^{18}O$	δD	$\delta^{13}C\_DIC$	^4He	^{20}Ne	$^3He/^4He$	corrected $^3He/^4He$
	(mg/L)	(mg/L)	(mg/L)	(‰)	(‰)	(‰)	(cm^3STPgH_2O)			(Ra)
KYU_17_B039	8.95	40.0	0.02	-8.2	-53	-10.0				
KYU_17_B040	7.33	35.9	0.07	-8.8	-56	-7.0				
KYU_17_B041	7.60	35.4	0.03	-8.9	-58	-10.7				
KYU_17_B042	9.06	44.2	0.09	-8.1	-52	-7.8				
KYU_17_B043	7.62	36.7	0.05	-8.4	-54	-8.1				
KYU_17_B044	10.4	47.7	0.03	-8.3	-53	-5.9				
KYU_17_B045	12.8	61.3	0.08	-7.8	-50	-9.8				
KYU_17_B046	16.8	75.8	0.05	-7.9	-51	-11.2				
KYU_17_B047	13.3	60.6	0.04	-7.8	-50	-10.0				
KYU_17_B048	14.9	63.1	0.03	-8.1	-52	-6.0				
KYU_17_B049	17.3	82.9	0.11	-7.7	-49	-7.9				
KYU_17_C001	5.36	26.6	0.12	-7.9	-48	-5.2				
KYU_17_C002	6.79	33.7	0.12	-7.9	-49	-8.4				
KYU_17_C003	5.48	26.6	0.05	-7.7	-48	-6.7				
KYU_17_C004	7.72	38.0	0.10	-8.2	-50	-10.0				
KYU_17_C005	8.51	41.5	0.08	-8.1	-51	-12.2				
KYU_17_C006	5.73	28.2	0.07	-7.8	-49	-9.5				
KYU_17_C007	4.36	21.4	0.05	-7.9	-50	-8.1				
KYU_17_C008	5.30	26.0	0.06	-7.8	-48	-4.5				
KYU_17_C009	4.46	22.1	0.08	-7.8	-48	-5.8				
KYU_17_C010	4.15	20.4	0.05	-7.8	-48	-5.5				
KYU_17_C011	4.32	21.2	0.05	-7.9	-48	-3.2				
KYU_17_C012	5.39	26.4	0.06	-8.1	-50	-3.3				
KYU_17_C013	3.29	15.9	0.02	-8.1	-50	-2.1				
KYU_17_C014	4.89	23.8	0.04	-8.0	-48	-4.5				
KYU_17_C015	4.62	20.8	0.01	-7.9	-49	-8.2				
KYU_17_C016	7.39	36.0	0.06	-7.8	-50	-9.5				
KYU_17_C017	6.79	33.2	0.06	-7.8	-49	-8.3				
KYU_17_C018	8.57	42.1	0.10	-8.2	-52	-12.1				
KYU_17_C019	7.17	34.1	0.04	-8.1	-51	-10.1				
KYU_17_C020	8.37	41.0	0.09	-8.4	-53	-13.1				
KYU_17_C021	9.33	45.4	0.08	-8.2	-52	-11.2				
KYU_17_C022	9.83	48.2	0.10	-8.0	-51	-6.4				
KYU_17_C023	7.76	38.2	0.09	-8.3	-52	-9.3				
KYU_17_C024	11.4	55.9	0.13	-8.3	-53	-9.7				
KYU_17_C025	13.4	65.3	0.13	-8.4	-54	-8.7				
KYU_17_C026	11.9	58.1	0.13	-8.1	-53	-8.8				
KYU_17_C027	15.0	74.2	0.22	-8.4	-54	-9.7				
KYU_17_C028	14.4	70.5	0.17	-8.4	-54	-9.2				
KYU_17_C029	14.9	73.4	0.22	-8.6	-55	-9.7				
KYU_17_C030	11.0	54.4	0.22	-8.2	-54	-11.0				
KYU_17_C031	14.3	70.2	0.15	-8.6	-56	-9.7				
KYU_17_C032	11.8	57.9	0.15	-8.7	-56	-9.5				
KYU_17_C033	11.2	55.3	0.18	-8.7	-57	-8.3				
KYU_17_C034	9.72	48.3	0.22	-8.9	-58	-9.4				
KYU_17_C035	11.2	54.7	0.11	-8.6	-56	-10.9				
KYU_17_C036	7.55	37.3	0.11	-8.7	-58	-9.2				
KYU_17_C037	3.25	15.6	0.02	-8.9	-58	-5.1				
KYU_17_C038	2.70	12.7	0.01	-9.0	-59	-3.1				
KYU_17_C039	3.43	16.0	0.01	-8.9	-58	-5.1				
KYU_17_C040	13.7	65.9	0.10	-8.6	-56	-10.6				
KYU_17_C041	14.6	72.0	0.22	-8.3	-55	-9.8				
KYU_17_C042	15.4	76.5	0.33	-8.3	-55	-9.6				
KYU_17_C043	13.9	68.9	0.35	-8.4	-55	-8.3				
KYU_17_C044	15.1	75.1	0.36	-8.5	-55	-10.1				
KYU_17_D001	9.40	46.6	0.17	-7.7	-49	-9.2				
KYU_17_D002	9.26	45.7	0.14	-7.6	-47	-9.9				
KYU_17_D003	8.02	39.8	0.15	-8.1	-51	-8.3				
KYU_17_D004	8.88	43.7	0.12	-7.7	-49	-9.1				
KYU_17_D005	11.1	54.7	0.16	-7.6	-48	-12.4				
KYU_17_D006	8.35	40.8	0.08	-7.9	-50	-6.4				
KYU_17_D007	10.2	50.7	0.23	-7.5	-46	-6.1				
KYU_17_D008	11.8	58.2	0.19	-7.1	-44	-9.8				
KYU_17_D009	11.4	56.3	0.17	-7.5	-47	-5.9				
KYU_17_D010	12.7	62.7	0.22	-7.2	-45	-11.3				
KYU_17_D011	7.30	36.2	0.14	-8.2	-51	-12.2				
KYU_17_D012	5.14	25.5	0.09	-8.0	-49	-5.8				
KYU_17_D013	5.30	24.5	0.02	-7.7	-48	-4.5				
KYU_17_D014	7.78	35.7	0.03	-7.5	-47	-13.1				
KYU_17_D015	6.59	32.4	0.08	-7.5	-48	-8.2				
KYU_17_D016	8.70	42.4	0.08	-7.7	-49	-12.1				

Sample_ID	TotC	HCO_3^- *	CO_3^{2-} *	$\delta^{18}O$	δD	$\delta^{13}C\_DIC$	^4He	^{20}Ne	$^3He/^4He$	corrected $^3He/^4He$
	(mg/L)	(mg/L)	(mg/L)	(‰)	(‰)	(‰)	($cm^3STPg H_2O$)			(Ra)
KYU_17_D017	8.94	43.5	0.10	-6.9	-44	-11.1				
KYU_17_D018	21.0	92.8	0.05	-6.8	-42	-10.9				
KYU_17_D019	11.8	54.5	0.04	-7.3	-46	-11.4				
KYU_17_D020	8.32	40.1	0.06	-7.5	-48	-10.0				
KYU_17_D021	10.7	46.4	0.02	-7.7	-49	-12.6				
KYU_17_D022	21.2	96.4	0.07	-6.7	-44	-14.5				
KYU_17_D023	14.7	73.2	0.42	-7.4	-47	-10.0				
KYU_17_D024	9.01	41.4	0.04	-6.7	-44	-12.0				
KYU_17_D025	13.9	67.2	0.11	-6.8	-45	-13.0				
KYU_17_D026	18.2	85.8	0.09	-6.9	-45	-16.1				
KYU_17_D027	11.7	56.4	0.08	-6.9	-45	-14.0				
KYU_17_D028	16.0	78.4	0.19	-8.0	-51	-6.0				
KYU_17_D029	18.0	88.5	0.24	-6.9	-45	-14.4				
KYU_17_D030	13.0	57.8	0.03	-6.8	-44	-14.5				
KYU_17_D031	10.5	44.9	0.02	-7.1	-45	-12.6				
KYU_17_D032	16.0	69.1	0.03	-7.0	-45	-14.2				
KYU_17_D033	19.8	93.9	0.11	-7.2	-47	-11.8				
KYU_17_D034	18.3	84.7	0.07	-7.3	-47	-16.9				
KYU_17_D035	14.8	55.7	0.01	-7.0	-45	-13.2				
KYU_17_D036	17.3	60.7	0.01	-7.2	-47	-16.8				
KYU_17_D037	13.8	63.1	0.05	-6.9	-45	-14.1				
KYU_17_D038	7.01	34.1	0.06	-7.4	-46	-7.1				
KYU_17_D039	11.1	50.2	0.03	-7.2	-46	-10.4				
KYU_17_D040	15.2	74.9	0.23	-8.2	-52	-6.6				
KYU_17_E001#	8.85	42.4	0.05	-8.0	-51	-15.4				
KYU_17_E002#	11.6	54.9	0.06	-7.6	-48	-15.9	4.78E-08	1.75E-07	1.38E-06	
KYU_17_E003	16.5	75.4	0.05	-7.5	-48	-22.1				
KYU_17_E004	14.8	64.1	0.03	-7.4	-47	-17.4	5.85E-08	1.97E-07	1.84E-06	
KYU_17_E005#	17.3	79.1	0.06	-7.5	-48	-17.2				
KYU_17_E006#	25.2	95.7	0.02	-7.1	-45	-16.9				
KYU_17_E007$	28.7	103	0.03	-8.6	-55	-7.2				
KYU_17_E008$	26.5	89.0	0.02	-8.5	-54	-5.1	5.48E-08	1.89E-07	2.50E-06	
ASO_18_K001	5.07	25.1	0.08	-8.0	-50	-5.3	4.34E-08	1.72E-07	1.34E-06	
ASO_18_K002	5.61	27.6	0.07	-8.3	-52	-5.1				
ASO_18_K003	4.67	22.9	0.06	-8.6	-54	-6.8				
ASO_18_K004	376	1400	0.46	-9.3	-63	-7.0				
ASO_18_K005	21.7	91.1	0.05	-8.5	-55	-5.8	1.37E-07	2.01E-07	6.63E-06	
ASO_18_K006	69.5	312	0.33	-8.6	-56	-6.7	2.41E-07	1.34E-07	6.05E-06	4.90
ASO_18_K007	4.06	19.8	0.04	-8.4	-52	-10.5				
ASO_18_K008	60.6	281	0.41	-8.5	-56	-6.3	2.95E-07	1.45E-07	6.47E-06	5.16
ASO_18_K009	4.43	21.9	0.07	-8.1	-50	-8.3	4.33E-08	1.72E-07	1.40E-06	
ASO_18_K010	3.87	18.8	0.03	-8.7	-55	-10.2				
ASO_18_K011	332	1320	0.55	-9.4	-63	-7.0				
KYU_18_A001	52.2	246	0.51	-8.4	-54	-5.3				
KYU_18_A002	75.5	361	1.02	-8.5	-56	-6.2	1.63E-06	1.48E-07	8.10E-06	5.90
KYU_18_A003$	25.3	108	0.06	-8.6	-56	-6.8				
KYU_18_A004$	22.0	78.6	0.02	-8.4	-54	-4.9				
KYU_18_A005	142	222	0.01	-8.2	-53	-5.0	4.35E-08	1.98E-08	6.70E-06	5.30
KYU_18_A006	21.8	99.5	0.15	-2.3	-39	-2.4				
KYU_18_A008#	11.5	44.8	0.01	-8.3	-54	-10.6				
KYU_18_A012#	10.4	50.6	0.09	-8.6	-55	-11.9				
KYU_18_A013#	8.90	43.6	0.10	-8.0	-51	-15.4				
KYU_18_A014#	14.4	68.0	0.07	-7.5	-48	-16.4				
KYU_18_A015#	20.2	95.3	0.11	-7.4	-48	-17.1				
KYU_18_A016#	40.6	192	0.23	-7.2	-46	-15.9				
KYU_18_A017#	19.1	83.4	0.04	-7.0	-46	-17.6				
ASO_18_K012	7.45	35.7	0.05	-8.4	-53	-12.9				
ASO_18_K013	75.2	339	0.39	-8.6	-56	-6.4	4.04E-07	1.32E-07	6.57E-06	5.04
ASO_18_K014	4.67	23.1	0.08	-7.9	-50	-9.2	1.33E-07	4.38E-07	1.37E-06	
ASO_18_K015	6.17	16.7	0.00	-8.6	-54	-11.7				
ASO_18_K016	389	1430	0.46	-9.4	-64	-7.0				
ASO_18_K017	22.6	94.6	0.05	-8.4	-55	-5.6				
KYU_18_B001	188	595	0.13	-9.1	-59	-5.6				
KYU_18_B002	234	108	0.00	-9.2	-59	-7.8				
KYU_18_B003	384	97.5	0.00	-9.0	-58	-8.0				
KYU_18_B004	325	833	0.10	-9.5	-61	-6.7				
KYU_18_B005	459	1740	0.64	-9.5	-61	-7.1	2.40E-07	5.77E-08	8.14E-06	6.14
KYU_18_B006	372	66.7	0.00	-9.1	-58	-8.2	5.05E-08	1.83E-08	8.42E-06	6.54
KYU_18_B007	27.5	120	0.09	-9.3	-60	-2.9				
KYU_18_B008	137	154	0.00	-9.2	-60	-8.1				

Sample_ID	TotC	HCO_3^- *	CO_3^{2-} *	$\delta^{18}O$	δD	$\delta^{13}C\_DIC$	^4He	^{20}Ne	$^3He/^4He$	corrected $^3He/^4He$
	(mg/L)	(mg/L)	(mg/L)	(‰)	(‰)	(‰)	($cm^3STPg H_2O$)			(Ra)
ASO_18_K018	7.01	34.9	0.18	-8.3	-53	-9.1				
ASO_18_K019	5.93	28.5	0.04	-8.6	-55	-7.8				
ASO_18_K020	4.87	23.8	0.04	-8.0	-51	-7.3	4.25E-08	1.66E-07	1.36E-06	
ASO_18_K021	20.0	83.5	0.05	-8.4	-55	-5.6	1.08E-07	1.85E-07	5.73E-06	
ASO_18_K022	63.8	296	0.45	-8.6	-56	-6.3				
ASO_18_K023	357	1290	0.39	-9.4	-63	-7.0				
KYU_19_A001	461	2120	3.29	-8.9	-59	-7.3				
KYU_19_A002	520	1810	0.54	-8.9	-59	-7.7				
KYU_19_A003	496	1920	0.85	-9.4	-61	-9.3				
KYU_19_A004	43.0	209	0.52	-8.8	-57	-6.5	7.82E-08	1.77E-07	4.39E-06	
KYU_19_A005	283	1210	0.87	-8.8	-59	-7.5	4.14E-07	7.29E-08	9.18E-06	6.83
KYU_19_A006	162	756	1.17	-9.3	-62	-7.1	3.18E-06	1.31E-07	1.04E-05	7.49
KYU_19_A007	1.50	7.32	0.15	-6.3	-53	-6.9	1.07E-08	2.30E-08	1.42E-06	
KYU_19_A015	6.19	19.1	0.00	-9.4	-60	-3.3				
KYU_19_A016	1.91	3.48	0.00	-9.4	-60	-6.2				
KYU_19_A017	2.36	7.56	0.00	-9.4	-60	-2.8				
KYU_19_A019	2.86	11.8	0.01	-6.9	-50	-16.9				
KYU_19_A020	331	1080	0.27	-8.9	-59	-5.5				
KYU_19_A021	14.0	64.6	0.10	-7.8	-54	-11.6	6.76E-08	1.03E-07	3.63E-06	
KYU_19_A022	186	195	0.01	-9.7	-63	-7.1				
KYU_19_A023	3.31	11.4	0.00	-9.1	-59	-13.5				
KYU_19_A024	9.88	22.4	0.00	-9.0	-57	-9.9				
KYU_19_C001	67.4	105	0.00	-9.1	-59	-7.7	1.31E-07	1.42E-07	7.26E-06	
KYU_19_C002	12.1	54.1	0.03	-9.2	-60	-0.2				
KYU_19_C003	361	1260	0.41	-8.7	-60	-5.4	1.66E-08	8.67E-09	8.76E-06	7.09
KYU_19_C004	356	1450	0.95	-8.8	-60	-5.6	2.20E-08	2.26E-08	6.19E-06	
KYU_19_C005	16.6	66.1	0.04	-6.9	-51	-5.8	3.77E-08	5.58E-08	5.44E-06	
KYU_19_C006	34.8	164	0.20	-9.2	-60	-5.8	4.64E-07	1.43E-07	9.11E-06	6.99
KYU_19_C007	12.8	63.5	0.33	-8.4	-56	-13.7	4.13E-08	1.35E-07	1.51E-06	