

## **Supplemental Data**

### **Table Legends**

Table 1a: Sodium, Dissolved Gas, Tritium, and Chlorofluorocarbon Data, Lake Fryxell, 2002-2003 austral summer

Table 1b: Sodium, Dissolved Gas, and Tritium Data, Lake Fryxell, 1999-2000 austral summer

Table 1c: Sodium and Chlorofluorocarbon Data, Lake Fryxell, 1994-1995 austral summer

Table 1d: Sodium, Dissolved Gas, and Tritium Data, Lake Fryxell, 1993-1994 austral summer

Table 1e: Sodium and Tritium Data, Lake Fryxell, 1989-1990 austral summer

Table 1f: Sodium and Tritium Data, Lake Fryxell, 1987-1988 austral summer

Table 1a: Sodium, Dissolved Gas, Tritium, and Chlorofluorocarbon Data, Lake Fryxell, 2002-2003 Austral Summer

Sample	Date	Depth (m)	Na $\ddot{s}$ (mmol L <sup>-1</sup> )	<sup>4</sup> He ( $\mu$ cc kg <sup>-1</sup> )	Ne ( $\mu$ cc kg <sup>-1</sup> )	N <sub>2</sub> (cc kg <sup>-1</sup> )	Ar (cc kg <sup>-1</sup> )	R/R <sub>air</sub>	<sup>3</sup> He (pcc kg <sup>-1</sup> )	Tritium (T.U.)	CFC-11 <sup>†</sup> (pg kg <sup>-1</sup> )	CFC-12 <sup>†</sup> (pg kg <sup>-1</sup> )
LF-02-5	Dec-2002	5	4.03	26.2	192	28.9	0.974	1.011	36.8	2.30	1912	1226
LF-02-6	Dec-2002	6	4.18	26.5	191	30.3	1.035	1.011	37.2	2.00	*	*
LF-02-7	Dec-2002	7	11.75	19.1	112	24.1	1.261	1.003	26.6	1.12	*	*
LF-02-9	Dec-2002	9	28.44	*	*	*	*	*	*	0.84	2409 $\pm$ 392	968 $\pm$ 163
LF-02-10	Dec-2002	10	35.31	12.1	70	25.3	1.685	1.226	20.6	0.60	*	*
LF-02-11	Dec-2002	11	54.53	18.8	75	25.4	1.637	1.088	28.4	0.26	13.5 $\pm$ 12	130 $\pm$ 7
LF-02-12	Dec-2002	12	67.05	*	*	*	*	*	*	<0.05	*	*
LF-02-13	Dec-2002	13	75.94	16.3	71	28.7	2.010	1.041	23.5	0.05	0	0
LF-02-15	Dec-2002	15	86.95	19.8	70	30.3	2.184	0.908	25.0	0.17	*	*
LF-02-17	Dec-2002	17	106.06	27.7	77	*	*	0.814	31.4	<0.05	*	*
LF-02-18	Dec-2002	18	102.80	25.8	170	32.6	2.310	0.801	28.8	<0.05	0	0

\*not available

<sup>†</sup>average (one standard deviation)

Table 1b: Sodium, Dissolved Gas, and Tritium Data, Lake Fryxell, 1999-2000 Austral Summer

Sample	Date	Depth (m)	Na $\delta$ (mmol L <sup>-1</sup> )	<sup>4</sup> He ( $\mu$ cc kg <sup>-1</sup> )	Ne ( $\mu$ cc kg <sup>-1</sup> )	N <sub>2</sub> (cc kg <sup>-1</sup> )	Ar (cc kg <sup>-1</sup> )	R/R <sub>air</sub>	<sup>3</sup> He (pcc kg <sup>-1</sup> )	Tritium (T.U.)
LF-99-7	Jan 2000	7	22.80	10.2	66	26.4	1.619	1.152	16.3	1.31
LF-99-9	Jan 2000	9	30.20	13.9	76	25.0	1.603	1.279	24.7	1.30
LF-99-11	Jan 2000	11	47.70	14.1	70	28.2	1.893	1.125	22.1	0.05
LF-99-13	Jan 2000	13	53.30	19.9	79	36.0	1.630	0.907	25.1	<0.05
LF-99-15	Jan 2000	15	88.70	28.5	84	48.4	3.361	0.826	32.7	<0.05
LF-99-16	Jan 2000	16	*	*	*	*	*	*	*	<0.05
LF-99-18	Jan 2000	18	117.50	33.8	80	39.0	2.734	0.771	36.2	<0.05

§<http://www.mcmlter.org>, Dec 1999

\*not available

*Table 1c: Sodium and CFC Data, Lake Fryxell, 1994-1995 Austral Summer*

Sample	Date	Depth (m)	Na§ (mmol L <sup>-1</sup> )	CFC-11 <sup>a</sup> (pg kg <sup>-1</sup> )	CFC-12 <sup>a</sup> (pg kg <sup>-1</sup> )	CFC-13 <sup>a</sup> (pg kg <sup>-1</sup> )
LF-94-5	94-95 Season	5	4.32	3497	724	916
LF-94-7	94-95 Season	7	10.62	1464	844	115
LF-94-9	94-95 Season	9	26.77	632	299	666
LF-94-13	94-95 Season	13	64.06	0	0	64
LF-94-18	94-95 Season	18	117.2	0	0	43

§<http://www.mcmlter.org>, Jan 1995

<sup>a</sup>Tyler et al., 1998

Table 1d: Sodium, Dissolved Gas, and Tritium Data, Lake Fryxell, 1993-1994 Austral Summer

Sample	Date	Depth (m)	Na§ (mmol L <sup>-1</sup> )	<sup>4</sup> He† (µcc kg <sup>-1</sup> )	Ne† (µcc kg <sup>-1</sup> )	N <sub>2</sub> (cc kg <sup>-1</sup> )	Ar† (cc kg <sup>-1</sup> )	R/R <sub>air</sub> ‡	<sup>3</sup> He (pcc kg <sup>-1</sup> )	Tritium¥ (T.U.)
LF-93-4	93-94 Season	4	4.66	*	*	*	*	*	*	*
LF-93-4.5	93-94 Season	4.5	*	17	108	*	*	0.99	*	*
LF-93-5	93-94 Season	5	*	16	108	*	1.20	0.94	*	2.50
LF-93-5.5	93-94 Season	5.5	*	16	113	*	1.25	0.98	*	*
LF-93-6	93-94 Season	6	6.47	19	119	*	1.28	1.07	*	2.50
LF-93-6.5	93-94 Season	6.5	*	19	117	*	1.33	1.07	*	*
LF-93-7	93-94 Season	7	12.78	19	113	*	1.35	1.12	*	2.50
LF-93-7.5	93-94 Season	7.5	*	19	113	*	1.40	1.14	*	*
LF-93-8	93-94 Season	8	24.00	19	104	*	1.45	1.23	*	2.00
LF-93-8.5	93-94 Season	8.5	*	17	94	*	1.50	1.23	*	*
LF-93-9	93-94 Season	9	32.46	17	83	*	1.55	1.26	*	1.80
LF-93-9.5	93-94 Season	9.5	*	17	*	*	1.70	1.23	*	*
LF-93-10	93-94 Season	10	42.52	17	81	*	1.90	1.23	*	1.20
LF-93-10.5	93-94 Season	10.5	*	17	83	*	*	1.18	*	*
LF-93-11	93-94 Season	11	59.55	18	81	*	2.20	1.16	*	0.70
LF-93-11.5	93-94 Season	11.5	*	18	83	*	2.40	1.12	*	*
LF-93-12	93-94 Season	12	74.44	19	83	*	2.50	1.07	*	0.18
LF-93-14	93-94 Season	14	*	25	83	*	2.60	1.04	*	0.07
LF-93-15	93-94 Season	15	99.22	28	86	*	2.70	0.91	*	0.07
LF-93-16	93-94 Season	16	*	29	77	*	2.75	0.87	*	0.06
LF-93-17	93-94 Season	17	111.19	29	74	*	*	0.82	*	0.06

§<http://www.mcmlter.org>, Jan 1994

†estimated from Hood et al., 1998, Fig. 2a

‡calculated from Hood et al., 1998, Fig. 2b

¥estimated from Hood et al., 1998, Fig. 3b

\*not available

*Table 1e: Sodium, and Tritium Data, Lake Fryxell, 1989-1990 Austral Summer*

Sample	Date	Depth (m)	Na§ (mmol L <sup>-1</sup> )	Tritium¥ (T.U.)
LF-89-5	Dec-1989	5	8.74	3.60
LF-89-7	Dec-1989	7	23.80	3.75
LF-89-8	Dec-1989	8	35.55	2.50
LF-89-9.5	Dec-1989	9.5	52.15	1.20
LF-89-11	Dec-1989	11	81.86	0.50
LF-89-12.5	Dec-1989	12.5	95.82	<0.05
LF-89-14	Dec-1989	14	94.48	0.25
LF-89-15.5	Dec-1989	15.5	102.78	0.50
LF-89-17	Dec-1989	17	105.39	0.60
LF-89-18	Dec-1989	18	108.53	<0.05

§courtesy of D. McKnight, University of Colorado

¥estimated from Miller and Aiken, 1996, Fig. 3c

*Table 1f: Sodium and Tritium Data, Lake Fryxell, 1987-1988 Austral Summer*

Sample	Date	Depth (m)	Na§ (mmol L <sup>-1</sup> )	Tritium¥ (T.U.)
LF-87-5.5	Dec-1987	5.5	10.92	3.90
LF-87-6	Dec-1987	6	15.02	3.60
LF-87-7.5	Dec-1987	7.5	29.42	3.70
LF-87-8.5	Dec-1987	8.5	39.53	2.20
LF-87-9	Dec-1987	9	47.67	2.50
LF-87-11	Dec-1987	11	81.86	0.20
LF-87-13	Dec-1987	13	91.74	<0.05
LF-87-14	Dec-1987	14	94.48	0.25
LF-87-18	Dec-1987	18	108.53	<0.05

§courtesy of D. McKnight, University of Colorado

¥estimated from Miller and Aiken, 1996, Fig. 3c

## **Supplemental Data**

### **Table Legends**

Table 2a: Sodium, Dissolved Gas, Tritium, and Chlorofluorocarbon Data, Lake Hoare, 2002-2003 austral summer

Table 2b: Sodium, Dissolved Gas, and Tritium Data, Lake Hoare, 1999-2000 austral summer

Table 2c: Sodium and Chlorofluorocarbon Data, Lake Hoare, 1994-1995 austral summer



Table 2a: Sodium, Dissolved Gas, Tritium, and Chlorofluorocarbon Data, Lake Hoare, 2002-2003 Austral Summer

Sample	Date	Depth (m)	Na (mmol L <sup>-1</sup> )	<sup>4</sup> He (μcc kg <sup>-1</sup> )	Ne (μcc kg <sup>-1</sup> )	N <sub>2</sub> (cc kg <sup>-1</sup> )	Ar (cc kg <sup>-1</sup> )	R/R <sub>air</sub>	<sup>3</sup> He (pcc kg <sup>-1</sup> )	Tritium (T.U.)	CFC-11 <sup>1</sup> (pg kg <sup>-1</sup> )	CFC-12 <sup>1</sup> (pg kg <sup>-1</sup> )
LH-02-4.5	Nov 2002	4.5	1.68	27	163	22.9	0.976	0.948	35.2	1.10	2222±388	1231±337
LH-02-5	Nov 2002	5	1.55	26	149	21.8	0.884	0.998	36.2	*	1748	669
LH-02-6	Nov 2002	6	2.23	32	136	20.2	1.057	0.952	42.2	1.60	2098±24	797±50
LH-02-8	Nov 2002	8	3.77	25	99	20.2	1.248	0.901	31.3	0.81	2665	1038
LH-02-10	Nov 2002	10	4.59	26	102	21.3	1.328	0.921	33.5	*	2525	953
LH-02-12	Nov 2002	12	4.90	37	112	23.5	1.410	0.838	42.7	0.79	1193±192	421±76
LH-02-14	Nov 2002	14	6.09	*	*	*	*	*	*	0.05	214	0
LH-02-16	Nov 2002	16	6.50	71	177	23.8	1.385	0.801	78.6	*	107±45	21±29
LH-02-18	Nov 2002	18	6.72	72	181	23.4	1.418	0.818	82.5	0.11	109±17	23±10
LH-02-20	Nov 2002	20	6.86	79	189	25.2	1.506	0.824	91.0	0.00	126	37
LH-02-21.5	Nov 2002	21.5	6.68	79	189	24.7	1.457	0.810	88.8	0.00	273±264	213±259

\*not available

<sup>1</sup>average (one standard deviation)

Table 2b: Sodium, Dissolved Gas, and Tritium Data, Lake Hoare, 1999-2000 Austral Summer

Sample	Date	Depth (m)	Na $\delta$ (mmol L <sup>-1</sup> )	<sup>4</sup> He ( $\mu$ cc kg <sup>-1</sup> )	Ne ( $\mu$ cc kg <sup>-1</sup> )	N <sub>2</sub> (cc kg <sup>-1</sup> )	Ar (cc kg <sup>-1</sup> )	R/R <sub>air</sub>	<sup>3</sup> He (pcc kg <sup>-1</sup> )	Tritium (T.U.)
LH-99-6	Jan 2000	6	2.47	21	96	20.8	1.431	0.954	28.2	0.67
LH-99-8	Jan 2000	8	3.25	24	100	22.3	1.509	0.894	30.1	0.61
LH-99-10	Jan 2000	10	4.29	33	122	21.4	1.391	0.879	40.8	0.43
LH-99-12	Jan 2000	12	4.77	64	187	24.8	1.512	0.855	75.9	0.18
LH-99-14	Jan 2000	14	5.83	88	236	26.4	1.561	0.863	106.1	0.07
LH-99-18	Jan 2000	18	6.69	103	263	28.9	1.615	0.846	121.5	0.00
LH-99-19	Jan 2000	19	6.76	107	279	28.2	1.599	0.771	115.0	0.00

§<http://www.mcmlter.org>, Jan 2000

Table 2c: Sodium, and Chlorofluorocarbon Data, Lake Hoare, 1994-1995 Austral Summer

Sample	Date	Depth (m)	Na§ (mmol L <sup>-1</sup> )	CFC-11 <sup>†</sup> (pg kg <sup>-1</sup> )	CFC-12 <sup>†</sup> (pg kg <sup>-1</sup> )	CFC-13 <sup>†</sup> (pg kg <sup>-1</sup> )
LH-94-4	94-95 Season	4	2.37	3050	1054	539
LH-94-6	94-95 Season	6	2.69	3124±62	1058±23	330±31
LH-94-8	94-95 Season	8	3.15	1819	621	178
LH-94-10	94-95 Season	10	4.01	812	308	35
LH-94-12	94-95 Season	12	5.07	515±95	207±47	78±68
LH-94-14	94-95 Season	14	6.13	255±150	80±64	12±16
LH-94-18	94-95 Season	18	6.78	289±93	91±36	30±7
LH-94-22	94-95 Season	22	6.94	105±146	44±18	6±8
LH-94-26	94-95 Season	26	7.06	214±28	63±15	11±15
LH-94-27.5	94-95 Season	27.5	7.35	123±6	31±4	0

§<http://www.mcmlter.org>, Jan 1995

†average (one standard deviation), Tyler et al., 1998