



## Supplement of

## How are oxygen budgets influenced by dissolved iron and growth of oxygenic phototrophs in an iron-rich spring system? Initial results from the Espan Spring in Fürth, Germany

Inga Köhler et al.

Correspondence to: Inga Köhler (inga\_koehler@gmx.de)

The copyright of individual parts of the supplement might differ from the article licence.

## Supporting information

Table S1: PhreeqC input data

Input (cold)*	E1a	E1b	E2	E3	E3.1	E4	E4.1	E5	E5.1	E6	E6.1	E7	E8	E9
pН	6.1	6.5	6.5	6.7	6.5	7.1	7.5	7.9	7.6	7.9	7.9	7.9	8.0	8.6
pe	4.6	4.3	4.2	4.1	3.6	3.3	2.9	2.8	2.7	2.8	3.3	4.1	5.2	7.0
density	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
temp	19.5	19.3	19.3	17.5	17.5	16.2	16.1	15.2	15.3	14.1	13.3	12.3	10.8	11.0
Na	2500	2500	2500	2500	2500	2500	2500	2400	2500	2500	2500	2400	92	23
Mg	166	163	165	165	165	164	164	164	166	166	165	162	18	14
Si	4.9	4.8	4.8	4.7	4.7	4.8	4.7	4.7	4.6	4.6	4.6	4.6	2.8.	2.7
Κ	200	200	200	200	200	200	200	200	200	200	200	200	11	5
Ca	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1100	91	60
Li	3.2	3.2	3.2	3.3	3.3	3.2	3.1	3.1	3.2	3.1	3.2	3.2	0.0	0.0
В	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.0	0.0
Cl	4400	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	170	38
S(6)	2100	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	92	30
Fe(II)	6.6	6.6	5.6	5.7	4.5	3.9	3.4	0.9	0.4	0.2	0.0	0.0	0.0	0.0
Alkal.**	820	828	796	790	810	804	808	804	816	760	770	760	195	160
Input (warm)*	E1a	E1b	E2	E3	E3.1	E4	E4.1	E5	E5.1	E6	E6.1	E7	E8	E9
Input (warm)*	E1a	E1b	E2	E3	E3.1	<b>E4</b>	<b>E4.1</b>	E5	<b>E5.1</b>	<b>E6</b>	<b>E6.1</b>	E7	E8	<b>E9</b>
Input (warm)*	<b>E1a</b> 6.3 5.4	E1b 6.4 5.0	E2 6.5 5.1	<b>E3</b> 6.6 5.2	<b>E3.1</b> 6.9 4.8	E4 7.2 5.0	<b>E4.1</b> 7.3 5.0	E5 7.4 5.8	<b>E5.1</b> 7.5 6.5	<b>E6</b> 7.5 6.6	<b>E6.1</b> 7.5 6.9	<b>E7</b> 7.5 4.1	E8 7.5 5.2	<b>E9</b> 8.0 7.0
Input (warm)* pH pe density	E1a 6.3 5.4 1.0	E1b 6.4 5.0 1.0	E2 6.5 5.1 1.0	<b>E3</b> 6.6 5.2 1.0	E3.1 6.9 4.8 1.0	E4 7.2 5.0 1.0	<b>E4.1</b> 7.3 5.0 1.0	E5 7.4 5.8 1.0	<b>E5.1</b> 7.5 6.5 1.0	E6 7.5 6.6 1.0	E6.1 7.5 6.9 1.0	E7 7.5 4.1 1.0	E8 7.5 5.2 1.0	E9 8.0 7.0 1.0
Input (warm)* pH pe density temp	E1a 6.3 5.4 1.0 21.3	E1b 6.4 5.0 1.0 21.2	E2 6.5 5.1 1.0 20.6	E3 <u>6.6</u> <u>5.2</u> <u>1.0</u> 21.6	E3.1 6.9 4.8 1.0 22.5	E4 7.2 5.0 1.0 22.7	E4.1 7.3 5.0 1.0 23.0	E5 7.4 5.8 1.0 24.0	<b>E5.1</b> 7.5 6.5 1.0 25.6	E6 7.5 6.6 1.0 25.7	E6.1 7.5 6.9 1.0 25.5	E7 7.5 4.1 1.0 24.9	E8 7.5 5.2 1.0 22.8	<b>E9</b> 8.0 7.0 1.0 16.8
Input (warm)* pH pe density temp Na	E1a 6.3 5.4 1.0 21.3 2500	E1b 6.4 5.0 1.0 21.2 2500	E2 6.5 5.1 1.0 20.6 2500	E3 6.6 5.2 1.0 21.6 2500	E3.1 6.9 4.8 1.0 22.5 2500	E4 7.2 5.0 1.0 22.7 2500	E4.1 7.3 5.0 1.0 23.0 2500	E5 7.4 5.8 1.0 24.0 2500	<b>E5.1</b> 7.5 6.5 1.0 25.6 2500	E6 7.5 6.6 1.0 25.7 2500	E6.1 7.5 6.9 1.0 25.5 2500	E7 7.5 4.1 1.0 24.9 2500	<b>E8</b> 7.5 5.2 1.0 22.8 170	<b>E9</b> 8.0 7.0 1.0 16.8 90
Input (warm)* pH pe density temp Na Mg	E1a 6.3 5.4 1.0 21.3 2500 180	E1b 6.4 5.0 1.0 21.2 2500 180	E2 6.5 5.1 1.0 20.6 2500 170	E3 6.6 5.2 1.0 21.6 2500 170	E3.1 6.9 4.8 1.0 22.5 2500 170	E4 7.2 5.0 1.0 22.7 2500 180	E4.1 7.3 5.0 1.0 23.0 2500 170	E5 7.4 5.8 1.0 24.0 2500 170	<b>E5.1</b> 7.5 6.5 1.0 25.6 2500 170	E6 7.5 6.6 1.0 25.7 2500 180	E6.1 7.5 6.9 1.0 25.5 2500 170	E7 7.5 4.1 1.0 24.9 2500 170	E8 7.5 5.2 1.0 22.8 170 33	<b>E9</b> 8.0 7.0 1.0 16.8 90 10
Input (warm)* pH pe density temp Na Mg Si	E1a 6.3 5.4 1.0 21.3 2500 180 4.8	E1b 6.4 5.0 1.0 21.2 2500 180 4.8	E2 6.5 5.1 1.0 20.6 2500 170 4.7	E3 6.6 5.2 1.0 21.6 2500 170 4.6	E3.1 6.9 4.8 1.0 22.5 2500 170 4.7	E4 7.2 5.0 1.0 22.7 2500 180 4.8	E4.1 7.3 5.0 1.0 23.0 2500 170 4.7	E5 7.4 5.8 1.0 24.0 2500 170 4.6	<b>E5.1</b> 7.5 6.5 1.0 25.6 2500 170 4.9	E6 7.5 6.6 1.0 25.7 2500 180 4.6	E6.1 7.5 6.9 1.0 25.5 2500 170 4.6	E7 7.5 4.1 1.0 24.9 2500 170 4.9	E8 7.5 5.2 1.0 22.8 170 33 3.0	<b>E9</b> 8.0 7.0 1.0 16.8 90 10 2.4
Input (warm)* pH pe density temp Na Mg Si K	E1a 6.3 5.4 1.0 21.3 2500 180 4.8 210	E1b 6.4 5.0 1.0 21.2 2500 180 4.8 210	E2 6.5 5.1 1.0 20.6 2500 170 4.7 210	E3 6.6 5.2 1.0 21.6 2500 170 4.6 210	E3.1 6.9 4.8 1.0 22.5 2500 170 4.7 210	E4 7.2 5.0 1.0 22.7 2500 180 4.8 210	E4.1 7.3 5.0 1.0 23.0 2500 170 4.7 210	E5 7.4 5.8 1.0 24.0 2500 170 4.6 210	E5.1 7.5 6.5 1.0 25.6 2500 170 4.9 210	E6 7.5 6.6 1.0 25.7 2500 180 4.6 210	E6.1 7.5 6.9 1.0 25.5 2500 170 4.6 210	E7 7.5 4.1 1.0 24.9 2500 170 4.9 210	E8 7.5 5.2 1.0 22.8 170 33 3.0 22	<b>E9</b> 8.0 7.0 1.0 16.8 90 10 2.4 10
Input (warm)* pH pe density temp Na Mg Si K Ca	E1a 6.3 5.4 1.0 21.3 2500 180 4.8 210 1200	E1b 6.4 5.0 1.0 21.2 2500 180 4.8 210 1200	E2 6.5 5.1 1.0 20.6 2500 170 4.7 210 1200	E3 6.6 5.2 1.0 21.6 2500 170 4.6 210 1200	E3.1 6.9 4.8 1.0 22.5 2500 170 4.7 210 1200	E4 7.2 5.0 1.0 22.7 2500 180 4.8 210 1200	E4.1 7.3 5.0 1.0 23.0 2500 170 4.7 210 1200	E5 7.4 5.8 1.0 24.0 2500 170 4.6 210 1200	E5.1 7.5 6.5 1.0 25.6 2500 170 4.9 210 1200	E6 7.5 6.6 1.0 25.7 2500 180 4.6 210 1200	E6.1 7.5 6.9 1.0 25.5 2500 170 4.6 210 1200	E7 7.5 4.1 1.0 24.9 2500 170 4.9 210 1100	E8 7.5 5.2 1.0 22.8 170 33 3.0 22 120	<b>E9</b> 8.0 7.0 1.0 16.8 90 10 2.4 10 90
Input (warm)* pH pe density temp Na Mg Si K Ca Li	E1a 6.3 5.4 1.0 21.3 2500 180 4.8 210 1200 3.2	E1b 6.4 5.0 1.0 21.2 2500 180 4.8 210 1200 3.2	E2 6.5 5.1 1.0 20.6 2500 170 4.7 210 1200 3.2	E3 6.6 5.2 1.0 21.6 2500 170 4.6 210 1200 3.2	E3.1 6.9 4.8 1.0 22.5 2500 170 4.7 210 1200 3.2	E4 7.2 5.0 1.0 22.7 2500 180 4.8 210 1200 3.2	E4.1 7.3 5.0 1.0 23.0 2500 170 4.7 210 1200 3.2	E5 7.4 5.8 1.0 24.0 2500 170 4.6 210 1200 3.2	E5.1 7.5 6.5 1.0 25.6 2500 170 4.9 210 1200 3.2	E6 7.5 6.6 1.0 25.7 2500 180 4.6 210 1200 3.2	E6.1 7.5 6.9 1.0 25.5 2500 170 4.6 210 1200 3.2	E7 7.5 4.1 1.0 24.9 2500 170 4.9 210 1100 3.2	E8 7.5 5.2 1.0 22.8 170 33 3.0 22 120 3.2	E9 8.0 7.0 1.0 16.8 90 10 2.4 10 90 90 0.0
Input (warm)* pH pe density temp Na Mg Si K Ca Li B	E1a 6.3 5.4 1.0 21.3 2500 180 4.8 210 1200 3.2 0.9	E1b 6.4 5.0 1.0 21.2 2500 180 4.8 210 1200 3.2 0.9	E2 6.5 5.1 1.0 20.6 2500 170 4.7 210 1200 3.2 0.9	E3 6.6 5.2 1.0 21.6 2500 170 4.6 210 1200 3.2 0.9	E3.1 6.9 4.8 1.0 22.5 2500 170 4.7 210 1200 3.2 0.9	E4 7.2 5.0 1.0 22.7 2500 180 4.8 210 1200 3.2 0.9	E4.1 7.3 5.0 1.0 23.0 2500 170 4.7 210 1200 3.2 0.9	E5 7.4 5.8 1.0 24.0 2500 170 4.6 210 1200 3.2 0.9	E5.1 7.5 6.5 1.0 25.6 2500 170 4.9 210 1200 3.2 0.9	E6 7.5 6.6 1.0 25.7 2500 180 4.6 210 1200 3.2 0.9	E6.1 7.5 6.9 1.0 25.5 2500 170 4.6 210 1200 3.2 0.9	E7 7.5 4.1 1.0 24.9 2500 170 4.9 210 1100 3.2 0.9	E8 7.5 5.2 1.0 22.8 170 33 3.0 22 120 3.2 0.0	E9 8.0 7.0 1.0 16.8 90 10 2.4 10 90 0.0 0.0 0.0
Input (warm)* pH pe density temp Na Mg Si K Ca Li B Cl	E1a 6.3 5.4 1.0 21.3 2500 180 4.8 210 1200 3.2 0.9 4500	E1b 6.4 5.0 1.0 21.2 2500 180 4.8 210 1200 3.2 0.9 4400	E2 6.5 5.1 1.0 20.6 2500 170 4.7 210 1200 3.2 0.9 4400	E3 6.6 5.2 1.0 21.6 2500 170 4.6 210 1200 3.2 0.9 4400	E3.1 6.9 4.8 1.0 22.5 2500 170 4.7 210 1200 3.2 0.9 4400	E4 7.2 5.0 1.0 22.7 2500 180 4.8 210 1200 3.2 0.9 4400	E4.1 7.3 5.0 1.0 23.0 2500 170 4.7 210 1200 3.2 0.9 4500	E5 7.4 5.8 1.0 24.0 2500 170 4.6 210 1200 3.2 0.9 4500	E5.1 7.5 6.5 1.0 25.6 2500 170 4.9 210 1200 3.2 0.9 4500	E6 7.5 6.6 1.0 25.7 2500 180 4.6 210 1200 3.2 0.9 4500	E6.1 7.5 6.9 1.0 25.5 2500 170 4.6 210 1200 3.2 0.9 4500	E7 7.5 4.1 1.0 24.9 2500 170 4.9 210 1100 3.2 0.9 4500	E8 7.5 5.2 1.0 22.8 170 33 3.0 22 120 3.2 0.0 290	E9 8.0 7.0 1.0 16.8 90 10 2.4 10 90 0.0 0.0 110
Input (warm)* pH pe density temp Na Mg Si Si K Ca Li B Cl S(6)	E1a 6.3 5.4 1.0 21.3 2500 180 4.8 210 1200 3.2 0.9 4500 2200	E1b 6.4 5.0 1.0 21.2 2500 180 4.8 210 1200 3.2 0.9 4400 2200	E2 6.5 5.1 1.0 20.6 2500 170 4.7 210 1200 3.2 0.9 4400 2100	E3 6.6 5.2 1.0 21.6 2500 170 4.6 210 1200 3.2 0.9 4400 2200	E3.1 6.9 4.8 1.0 22.5 2500 170 4.7 210 1200 3.2 0.9 4400 2200	E4 7.2 5.0 1.0 22.7 2500 180 4.8 210 1200 3.2 0.9 4400 2200	E4.1 7.3 5.0 1.0 23.0 2500 170 4.7 210 1200 3.2 0.9 4500 2200	E5 7.4 5.8 1.0 24.0 2500 170 4.6 210 1200 3.2 0.9 4500 2200	E5.1 7.5 6.5 1.0 25.6 2500 170 4.9 210 1200 3.2 0.9 4500 2200	E6 7.5 6.6 1.0 25.7 2500 180 4.6 210 1200 3.2 0.9 4500 2200	E6.1 7.5 6.9 1.0 25.5 2500 170 4.6 210 1200 3.2 0.9 4500 2200	E7 7.5 4.1 1.0 24.9 2500 170 4.9 210 1100 3.2 0.9 4500 2200	E8 7.5 5.2 1.0 22.8 170 33 3.0 22 120 3.2 0.0 290 150	E9 8.0 7.0 1.0 16.8 90 10 2.4 10 90 0.0 0.0 110 56
Input (warm)* pH pe density temp Na Mg Si K Ca Li B Cl S(6) Fe(II)	E1a 6.3 5.4 1.0 21.3 2500 180 4.8 210 1200 3.2 0.9 4500 2200 6.9	E1b 6.4 5.0 1.0 21.2 2500 180 4.8 210 1200 3.2 0.9 4400 2200 6.7	E2 6.5 5.1 1.0 20.6 2500 170 4.7 210 1200 3.2 0.9 4400 2100 5.6	E3 6.6 5.2 1.0 21.6 2500 170 4.6 210 1200 3.2 0.9 4400 2200 4.0	E3.1 6.9 4.8 1.0 22.5 2500 170 4.7 210 1200 3.2 0.9 4400 2200 2.9	E4 7.2 5.0 1.0 22.7 2500 180 4.8 210 1200 3.2 0.9 4400 2200 1.5	E4.1 7.3 5.0 1.0 23.0 2500 170 4.7 210 1200 3.2 0.9 4500 2200 0.7	E5 7.4 5.8 1.0 2500 170 4.6 210 1200 3.2 0.9 4500 2200 0.1	E5.1 7.5 6.5 1.0 25.6 2500 170 4.9 210 1200 3.2 0.9 4500 2200 0.0	E6 7.5 6.6 1.0 25.7 2500 180 4.6 210 1200 3.2 0.9 4500 2200 0.0	E6.1 7.5 6.9 1.0 25.5 2500 170 4.6 210 1200 3.2 0.9 4500 2200 0.0	E7 7.5 4.1 1.0 24.9 2500 170 4.9 210 1100 3.2 0.9 4500 2200 0.0	E8 7.5 5.2 1.0 22.8 170 33 3.0 22 120 3.2 0.0 290 150 0.0	E9 8.0 7.0 1.0 16.8 90 10 2.4 10 90 0.0 0.0 110 56 0.0

\* units ppm \*\* Alkalinity as ppm CaCO<sub>3</sub>

Table S2: PhreeqC output data

Phase (cold)	SI*	Log IAP**	Log K (202 K,1 atm)
E1a			
Ferrihydrite	0.13	5.02	4.89
Goethite	5.83	5.03	-0.80
Hematite	13.64	10.05	-3.58
Phase	SI*	Log IAP**	Log K (202 K,1 atm)
E1b			
Ferrihydrite	1.06	5.95	4.89
Goethite	6.74	5.95	-0.79
Hematite	15.47	11.90	-3.57
Cidanita		10 -1	40.05

Phase	SI*	Log IAP**	Log K (202 K,1 atm)
E2			
Ferrihydrite	1.01	5.90	4.89
Goethite	6.70	5.90	-0.79
Hematite	15.38	11.81	-3.57
Siderite	0.30	-10.56	-10.85
Phase	SI*	Log IAP**	Log K (202 K,1 atm)
E3			
Ferrihydrite	1.45	6.34	4.89
Goethite	7.07	6.35	-0.73
Hematite	16.12	12.69	-3.42
Siderite	0.47	-10.37	-10.84
Phase	SI*	Log ΙΑΡ**	Log K (202 K.1 atm)
F3.1	51	Lugini	
Ferrihvdrite	0.33	5.22	4.89
Goethite	5 95	5.23	-0.73
Hematite	13.88	10.45	-3.42
Siderite	0.19	-10.65	-10.84
	0.17	10.00	10.01
Phase	SI*	Log IAP**	Log K (202 K,1 atm)
<u>E4</u>			
Ferrihydrite	1.70	6.60	4.89
Goethite	7.28	6.60	-0.68
Hematite	16.52	13.20	-3.32
Siderite	0.68	-10.15	-10.83
Phase	SI*	Log IAP**	Log K (202 K,1 atm)
<u>E4.1</u>	• • •		
Ferrihydrite	2.20	7.09	4.89
Goethite	7.77	7.09	-0.67
Hematite	17.50	14.19	-3.31
Siderite	0.97	-9.86	-10.83
Phase	SI*	Log IAP**	Log K (202 K,1 atm)
E5			
Ferrihydrite	2.81	7.70	4.89
Goethite	8.34	7.70	-0.64
Hematite	18.64	15.40	-3.24
Siderite	0.68	-10.14	-10.83
Phase	SI*	Log IAP**	Log K (202 K,1 atm)
E5.1		0	
Ferrihydrite	1.47	6.36	4.89
Goethite	7.01	6.36	-0.64
Hematite	15.98	12.73	-3.25
Siderite	0.16	-10.67	-10.83
Phase	SI*	Log IAP**	Log K (202 K,1 atm)
E6		0	
Ferrihydrite	2.02	6.91	4.89
Goethite	7.51	6.91	-0.60
Hematite	16.98	13.83	-3.15
Siderite	0.06	-10.76	-10.82
Phase	SI*	Log IAP**	Log K (202 K.1 atm)
E6.1***			
Ferrihydrite	1.35	6.24	4.89
Goethite	6.81	6.24	-0.57
Hematite	15.57	12.48	-3.08
Phase (warm)	SI*	Log IAP**	Log K (202 K,1 atm)

Ferrihydrite	1.67	6.56	4.89
Goethite	7.43	6.57	-0.87
Hematite	1686	13.13	-3.72
Phase	SI*	Log IAP**	Log K (202 K.1 atm)
E1b		- 8	
Ferrihydrite	1.57	6.46	4.89
Goethite	7.33	6.47	-0.86
Hematite	16.65	12.93	-3.72
Siderite	0.33	-10.53	-10.87
Phase	SI*	Log IAP**	Log K (202 K.1 atm)
E2		-8	8 ( ) ,
Ferrihydrite	1.87	6.76	4.89
Goethite	7.61	6.77	-0.84
Hematite	17.21	13.54	-3.67
Siderite	0.34	-10.52	-10.86
Phase	SI*	Log IAP**	Log K (202 K,1 atm)
E3		-8	8 ( ) ,
Ferrihydrite	2.16	7.05	4.89
Goethite	7.93	7.05	-0.88
Hematite	17.85	14.10	-3.75
Siderite	0.30	-10.57	-10.87
Phase	SI*	Log IAP**	Log K (202 K.1 atm)
E3.1		8	
Ferrihydrite	2.55	7.44	4.89
Goethite	8.35	7.44	-0.91
Hematite	18.70	14.88	-3.82
Siderite	0.47	-10.40	-10.87
Phase	SI*	Log IAP**	Log K (202 K.1 atm)
E4		Log III	
Ferrihydrite	2.99	7.88	4.89
Goethite	8.80	7.88	-0.92
Hematite	19.60	15.77	-3.83
Siderite	0.52	-10.36	-10.88
Phase	SI*	Log IAP**	Log K (202 K 1 atm)
F4 1	51	LUgIAI	
Ferrihvdrite	3.21	8.10	4.89
Goethite	9.03	8.10	-0.93
Hematite	20.06	16.20	-3.86
Siderite	0.13	-10.75	-10.88
Phase	SI*	Log IAP**	Log K (202 K 1 stm)
E5	51	LUgIAI	$\log \mathbf{K} (202 \mathbf{K}, 1 \operatorname{atm})$
Ferrihvdrite	3.26	8.15	4.89
Goethite	9.12	8.15	-0.96
Hematite	20.24	16.31	-3.93
Siderite	-	-	-
Dhasa	CI*	Log IAD**	$L_{0,\alpha} V (202 V 1 \text{ atm})$
F5 1	51	Log IAF	Log K (202 K,1 atili)
E3.1 Ferrihvdrite			
Goethite	-		-
Hematite	_	_	_
Siderite	-	-	-
Dhasa	CT-		$\mathbf{L} = \mathbf{V} (\mathbf{A} \mathbf{A} \mathbf{V} 1 + \mathbf{A})$
rnase F6	51*	Log IAP**	Log K (202 K,1 atm)
Eerrihydrite			
Goethite			-
Souther	-	-	-

-	-	-
-	-	-
SI*	Log IAP**	Log K (202 K,1 atm)
-	-	-
-	-	-
-	-	-
SI*	Log IAP**	Log K (202 K,1 atm)
-	-	-
-	-	-
-	-	-
SI*	Log IAP**	Log K (202 K,1 atm)
-	-	-
-	-	-
-	-	-
SI*	Log IAP**	Log K (202 K,1 atm)
-	-	-
-	-	-
-	-	-
	- SI* - - - - - - - - - - - - - - - - - - -	

\* Saturation index = log10(fugacity) \*\* Ion activity product \*\*\* Last sampling point with Fe(II)

**Supplement Figure S1** At sampling point E4.1, Lyngby asp. dominated cyanobacterial mats and generated (presumed) oxygen bubbles via photosynthesis. The red box on the right is an enlargement of the red section on the left.



**Supplement Figure S2.** CLSM images of the bio mat sample E2 from inside the piping. Shown from left to right are a superimposed image (Overlay) of Chl a (Chl a), Chl a plus PBP (Chl a plus PBP) fluorescence and laser transmission (L. Trans.). Note that the images "Overlay" and "L. Trans." are colourless because no photosynthetic organisms existed in the area where these specific samples were taken due to spring plumbing. The two middle images show some small green and red dots that are probably artefacts. These were likely created by the very high laser intensity that was necessary to create these images.

