



ECOSYSTEMS AND THE CARBON CYCLE: FIELD SHEET

CARBON FLUX		Site 1		Site 2		Site 3		Site 4	
		Uncovered	Covered	Uncovered	Covered	Uncovered	Covered	Uncovered	Covered
Time	T ₀								
	T ₂₀								
CO ₂ Concentration (ppm)	T ₀								
	T ₂₀								
	ΔCO ₂								
Air Temperature (°)	T ₀								
	T ₂₀								
	Average								
Humidity (%)	T ₀								
	T ₂₀								
	Average								

VEGETATION (% cover)	Site 1			Site 2			Site 3			Site 4		
	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
Grass												
Herb												
Moss												
Rush												
Bracken												
Woody Plant												
Bare Ground												
Total % cover												
Max Plant Height (cm)												

SOIL	Site 1	Site 2	Site 3	Site 4
O Horizon Depth (cm)				
Soil pH				
O Horizon Colour				
O Horizon Moisture				
O Horizon Soil Temp (°)				

Group Members: _____

Date: _____



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CARBON FLUX		Site 5		Site 6		Site 7		Site 8	
		Uncovered	Covered	Uncovered	Covered	Uncovered	Covered	Uncovered	Covered
Time	T ₀								
	T ₂₀								
CO ₂ Concentration (ppm)	T ₀								
	T ₂₀								
	ΔCO ₂								
Air Temperature (°)	T ₀								
	T ₂₀								
	Average								
Humidity (%)	T ₀								
	T ₂₀								
	Average								

VEGETATION (% cover)	Site 5			Site 6			Site 7			Site 8		
	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3	Q1	Q2	Q3
Grass												
Herb												
Moss												
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TOPOGRAPHY	Site 1	Site 2	Site 3	Site 4
Grid Reference				
Elevation (m)				
Aspect (°)				
Slope angle (°)				

CLIMATE	Site 1	Site 2	Site 3	Site 4
Wind speed (ms ⁻¹)				
Cloud Cover (Oktas)				
Reflected light (lx)				

LAND EXPOSURE MEASUREMENT

TOPEX: This is the degree of exposure as influenced by the topographic features surrounding a site. At each site measure the angle using a clinometer from where you stand to the skyline. Do this facing in the direction of the 8 cardinal directions of the compass. Add up the 8 angles and the total is the TOPEX value for that site. The lower the TOPEX value the more exposed the site. The degree of exposure is important for the way we use the land. Some plants will not grow in exposed conditions.

COMPASS DIRECTION	CLINOMETER ANGLE			
	Site 1	Site 2	Site 3	Site 4
N = 0°				
NE = 45°				
E = 90°				
SE = 135°				
S = 180°				
SW = 225°				
W = 270°				
NW = 315°				
TOTALS				
0 - 10	Severely exposed	61 - 100	Moderately sheltered	
11 - 30	Very exposed	100+	Very sheltered	
31 - 60	Moderately exposed			

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ESTIMATING CARBON CONTENT OF WOODLAND

- 1) Select two random numbers from a random numbers table, and pace out to a point using these numbers (for instance, if you selected 72, you may walk forwards for seven paces, and to the left for two paces).
- 2) After pacing, use the tree you find yourself closest to as your measurement.
 - a) Measure the tree's circumference at breast height (CBH) with a tape measure.
 - b) Assess the height of the tree – accurately using a clinometer, or just by 'eye'.
 - c) Use these two sets of information to get a figure for the amount of carbon in the tree (see following page).
 - d) Repeat this process until you have also assessed the surrounding 11 trees.
- 3) Measure the size of the square-shaped area which contains your 12 trees.

TREE	CBH (m)	Height (m)	Carbon Content (kg)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
Total Carbon Content			

Sampling area _____

Area of woodland _____

Total carbon in woodland _____

We can look at a map and work out the size of the woodland in km². We know the area in which our 12 trees were sampled. We can then calculate the number of trees in the overall area, and therefore the total amount of carbon in the woodland.

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Circumference at Breast Height (in m)

		0.25	0.5	0.75	1.0	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0	3.25	3.5	3.75	4.0	4.25	4.5
Tree Height (in meters)	2.0	10	14	19	26	36	48	61	77	95	115	138	162	189	217	248	281	316	353
	4.0	11	18	28	43	62	86	113	145	181	221	266	315	368	425	486	552	622	696
	6.0	13	22	38	60	89	124	165	213	267	327	394	467	547	633	725	823	928	1,040
	8.0	14	26	48	77	115	162	217	281	353	433	522	620	726	840	963	1,095	1,235	1,383
	10	15	31	57	94	142	200	269	349	439	539	651	773	905	1,048	1,202	1,366	1,541	1,727
	12	16	35	67	111	168	238	321	416	525	645	779	925	1,084	1,256	1,440	1,638	1,848	2,070
	14	17	39	76	128	195	276	373	484	610	751	907	1,078	1,263	1,464	1,679	1,909	2,154	2,414
	16	18	43	86	145	221	315	425	552	696	857	1,035	1,231	1,443	1,672	1,917	2,180	2,460	2,757
	18	19	48	95	162	248	353	477	620	782	963	1,164	1,383	1,622	1,879	2,156	2,452	2,767	3,101
	20	20	52	105	179	274	391	529	688	868	1,069	1,292	1,536	1,801	2,087	2,394	2,723	3,073	3,444
	22	21	56	114	196	301	429	581	756	954	1,175	1,420	1,688	1,980	2,295	2,633	2,994	3,379	3,787
	24	22	60	124	213	327	467	633	823	1,040	1,281	1,549	1,841	2,159	2,503	2,872	3,266	3,686	4,131
	26	23	64	133	230	354	505	685	891	1,126	1,387	1,677	1,994	2,338	2,710	3,110	3,537	3,992	4,474
	28	24	69	143	247	380	544	737	959	1,211	1,493	1,805	2,146	2,517	2,918	3,349	3,809	4,298	4,818
	30	25	73	152	264	407	582	789	1,027	1,297	1,599	1,933	2,299	2,697	3,126	3,587	4,080	4,605	5,161
	32	26	77	162	281	433	620	840	1,095	1,383	1,705	2,062	2,452	2,876	3,334	3,826	4,351	4,911	5,505
	34	27	81	172	298	460	658	892	1,163	1,469	1,811	2,190	2,604	3,055	3,541	4,064	4,623	5,217	5,848
	36	28	86	181	315	486	696	944	1,231	1,555	1,917	2,318	2,757	3,234	3,749	4,303	4,894	5,524	6,192
	38	29	90	191	332	513	734	996	1,298	1,641	2,023	2,446	2,910	3,413	3,957	4,541	5,166	5,830	6,535
	40	31	94	200	349	539	773	1,048	1,366	1,727	2,129	2,575	3,082	3,592	4,165	4,780	5,437	6,137	6,879
42	32	98	210	366	566	811	1,100	1,434	1,813	2,235	2,703	3,215	3,772	4,373	5,018	5,708	6,443	7,222	
44	33	103	219	382	592	849	1,152	1,502	1,898	2,341	2,831	3,368	3,951	4,580	5,257	5,980	6,749	7,565	
46	34	107	229	399	619	887	1,204	1,570	1,984	2,448	2,960	3,520	4,130	4,788	5,495	6,251	7,056	7,909	
48	35	111	238	416	645	925	1,256	1,638	2,070	2,554	3,088	3,673	4,309	4,996	5,734	6,522	7,362	8,252	

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Date: _____