

New Connectivities and Environmental Activism: Examining the Role of Religious Groups with Social Network Analysis on Twitter

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There is something new happening with environmental activism. Whereas environmentalism in the latter half of the twentieth-century was characterised by a variety of fault lines generated by different forms of action whether radical, performative, policy-engaged, habitat-focussed, etc. each orientation drove different agendas such that groups often vied with one another as much as they did with the forces causing ecological devastation. One possible reason for the new turn towards alliances, collaborations, and more dynamic group identities is likely the way that the issue of climate change has captivated the global imagination. The astonishing range and urgency of climate change has drawn activists out from their traditional enclaves and this is shown in a range of new and highly diverse alliances which are emerging, such as “Stop Climate Chaos” in the United Kingdom, or the “Environmental Priorities Coalition” in the USA. In the light of these new forms of connectivity among activist groups, in this study I seek to analyse the digital space occupied by a specific (and often ignored) subset of environmental activists, namely religious groups. Through Social Network Analysis (SNA), I provide an assessment of the twitter traffic and engagement by religious sustainability and environmental groups within the larger constellation of conservation, environmental media, and government sustainability groups on national and international levels. SNA is a particularly well-suited tool for this kind of analysis, as it offers a way to transcend atomistic perspectives and grasp at the new mobilities and connectivities which characterise the work of these groups. As Wasserman and Faust suggest, SNA aims for a “unit of analysis” which is not the individual, “but an entity consisting of a collection of individuals and the linkages among them” {Wasserman 1994@5}. In seeking to better understand the significance and operations of Eco-Congregation Scotland (ECS) in research conducted from 2013-2016, we sought to deploy

SNA towards a range of data and contexts, seeking to understand the environmental networks in which ECS operated and the smaller networks of which ECS was composed.

Before diving into the data and analysis, I would like to preface with some discussion of how environmental groups may be categorised. This will form the basis for some clusters which will help to illuminate some of the analysis which follows. We may begin by dividing environmental groups into two basic categories based on their political disposition. Seen in this way, our first cluster includes those groups which are located within the radical political tradition and which see positive environmental change as requiring a radical transformation or confrontation of the current political structures. Groups working in this mode may often take a confrontational stance, or see themselves as offering a counter-cultural alternative. The most obvious example of this mode of action may be represented by Earth First!, but it also includes groups like Greenpeace, the Greenpeace spin-off Friends of the Earth, or the student group People and Planet. The alternative mode is represented by those groups which seek to work within current political structures, and these groups are often actually quasi-governmental, receiving some or all of their funding from government. Groups which fit this category in Britain include “Keep Britain Tidy” (or the Scottish counterpart “Keep Scotland Beautiful” formerly named ENCAMS), or the Royal Society for the Protection of Birds. This second group is often focussed on good environmental citizenship, and as such prevents a more radical posture which might seek to oppose the structures of civil society which provide the basis for measuring good citizenship. Having laid out these two categories, it is important to note that both have become increasingly unstable over recent decades, with groups such as RSPB widening their focus to include things aside from birds, such as lobbying to change government policy and conversely with groups such as Greenpeace taking on more domestic concerns alongside their traditional focus on dramatic direct action. In both cases, some of the internal membership of these groups has resisted such reorientation, but it has nonetheless become the case that one cannot define an Environmental Non-Governmental Organisation (ENGO) along these lines in a strict sense.

Whether or not they are strictly true, these two categories carry significant aesthetic freight for individuals seeking to participate in environmental action, and this is particularly the case for church groups in Britain seeking to participate in environmental action. In one concrete example of this phenomenon, I had an individual approach me after I had spoken at an event in a church about the research being conducted for this project. The

person waited until everyone in the room had gone and then said to me with a somewhat uneasy expression, “you know, my husband and I are both members of Greenpeace.” Their presumption here was that a good church-goer was expected to avoid a radical group like Greenpeace. In my fieldwork, I have found evidence that this phenomena of uneasiness also exists in an inverse way. In one interview with an interfaith environmental group in the USA, a campaigner suggested to me “what we discovered as we became [active] into advocacy, [was that] at first the environmental community was very suspicious of us, very suspicious. . . and so they thought really that . . . we were a trojan horse for creationism and they really didn’t know how to deal with us.”¹ On both sides, misunderstanding and suspicion have prevented alliances from forming in the past, and yet now we see that these understandings are giving way – even if for strictly pragmatic reasons – to new coalitions which are providing more effective advocacy and organising. Understanding the ways in which religious environmental groups function will benefit from a deeper understanding of these dynamics with other environmental groups, and their place within these networks. It will also be useful to keep this uneasiness in mind when contrasting the levels of connectedness between religious ENGOs and other ENGOs with the levels of connection between religious ENGOs and other parallel religious groups such as denominational leadership and religious media. As I will go on to suggest, there is good reason to suspect that religious ENGOs offer a crucial point of connection to the broader environmental and conservation movement where almost no other forms of connection exist for religious communities to environmental politics.

Analysis 1: Environmentalists on Twitter

From our first data collection pool, we created a social network graph based on twitter participation by religious groups and ENGOs in Britain (both faith-based and secular). For those readers who may not be familiar with SNA jargon, it may be helpful to note that social network analysis consists essentially of individual points (called “nodes” or “vertices”) and the visual representation of connections between these points in the form of lines (called “edges”). For our visualisation, nodes were identified using a “snowball” technique, which resulted in a diverse selection of 82 vertices (or nodes). This included the starting point of 10 religious ENGOs (@ecocongregation @ArochaUK @ECenglandwales @JRayl @GreenChristian_ @ARCworld

¹Interview, 25 March 2015.

@ArthurRankCentr @OperationNoah @biggreenjewish @muslimness) and two staff members (@MiriamDobson @gordonhudsonu) as well as a selection of secular ENGOs (such as @rspbscotland @foescot @wwf_uk_politics), a small selection of twitter-active executives, government conservation groups (such as @naturalengland), development agencies involved in environmental advocacy (such as @oxfamgb), church twitter accounts (@c_of_e), and several forms of news media including faith/environment sections of mainstream media (@timesfaith @gdnbelief), church-oriented media (@churchtimes), and denominational publications (). The total data set included 17350 edges, and data was obtained and connections calculated using NodeXL software, which took the complete followers / following lists for each node and looked for mentions of these nodes within the most recent 200 tweets for each account. The richness of this dataset can be seen in the inclusion of media, government, secular and religious sources, including some possible sources (especially media) where one might expect to find functioning as a bridge between several sub-groups.

Twitter offers a useful focal point for this kind of analysis because following someone on twitter can often serve more as a symbolic action than a substantive one. It is often the case that active twitter users will have private “lists” which they use as a regular reading list in order to filter out a much larger pool of persons they follow. Consultants on social media engagement will often recommend that whenever someone chooses to “follow” that group on twitter they return the favour by following that person. In this way, following on twitter can serve as a context for offering both reciprocity and recognition. Of course, twitter engagement can be quite uneven, with some groups having begun nearly a decade ago and employing a full-time specialists in social media engagement as a form of outreach and recruiting (at the time of this writing on 28 March 2015 the first node to join twitter among those analysed, @greenpeaceuk, had 121,071 followers and 17,504 tweets whereas @birdlife_news, which was roughly in the middle with a start date of July 2009 nonetheless also had 37,388 followers and followed 5819 other twitter users), while for others twitter use is less robust or formally worked-out (@arochauk had only 418 followers and 298 tweets), nonetheless the picture that appears is surprisingly coherent.

Table 1.1 Twitter Activity of Top-10 and Religious ENGO Vertices (See Appendix A for Full Data)

ID	Vertex	Followed	Followers	Tweets	Favorites	Joined Twitter Date (UTC)
26	oxfamgb	8090	198176	24326	797	12-Aug-08
21	natures_	2422	148489	36250	1628	20-Jan-09
19	greenpea	4700	121071	17504	669	10-Apr-07
18	wwf_uk	3161	118890	15511	41931	29-Jan-09
37	defragov	656	76297	10953	129	23-Jun-09
8	soilassoc	2605	70557	19955	4149	6-Nov-08
58	christian	8450	70101	17307	187	7-Jan-09
38	naturale	681	68480	8597	134	16-Sep-09
40	wildlifet	861	55596	9706	5794	16-Jul-09
59	c_of_e	4378	47929	8890	249	3-Feb-09

34 | arcworld | 2649 | 2554 | 1489 | 120 | 17-Feb-09 12 | greenchristian_ | 1204 | 1361 | 4566 | 30 | 17-Feb-12 42 | cofecampaign | 839 | 1325 | 1628

| 11 | 9-Jun-10 31 | operationnoah | 386 | 795 | 908 | 45 | 18-Mar-09 44 |
 ecocongregation | 190 | 478 | 1543 | 1 | 16-Mar-09 53 | arthurrankcentr | 255
 | 426 | 375 | 5 | 2-Mar-10 47 | arochauk | 64 | 418 | 298 | 98 | 24-Sep-13 57 |
 ecenglandwales | 260 | 295 | 565 | 20 | 24-Apr-13 68 | actscot | 222 | 121 | 95
 | 257 | 13-Nov-14 84 | jrayl | 23 | 4 | 0 | 0 | 11-Apr-09

1. Bridges and Outliers

One of the key calculations that is relevant to this analysis is the *betweenness centrality*. This represents a calculation of the degree to which a specific actor lies on a path between two others, so nodes with a high calculation on this scale represent those which are not just more highly connected, but also act as a bridge between others who are unconnected. Betweenness represents perhaps the most dramatic relief for the religious ENGO in this study. In this analysis, the top three highest *between centrality* calculations were all religious ENGO's: with @greenchristian_ at 973.237, @operationnoah at 375.604 and @ecocongregation at 250.675. The average Betweenness Centrality was 63.171 and the median Betweenness Centrality was 28.53.

Table 1.2 Top Vertices on Betweenness Centrality Graph Metrics

ID	Vertex (Twitter @Handle)	Betweenness Centrality
12	greenchristian_	973.237
31	operationnoah	375.604
44	ecocongregation	250.675
58	christian_aid	224.759
19	greenpeaceuk	201.979
15	christianaidscot	181.776
17	sccscot	161.144
18	wwf_uk	154.77
62	ctbi	145.281
7	peopleandplanet	144.455
42	cofecampaign	142.963

53 | arthurrankcentr | 58.347 14 | biggreenjewish | 33.362 34 | arcworld |
 32.505 57 | ecenglandwales | 22.307 47 | arochauk | 9.57 60 | muslimness |
 0.179 84 | jrayl | 0

Sociologist Mark S. Granovetter highlighted the significance of this kind of networked configuration with his now famous 1973 paper on *The Strength*

of *Weak Ties*. Granovetter took the common-sense the observation that “our acquaintances (weak ties) are less likely to be socially involved with one another than are our close friends (strong ties)” and noted that though the relationships with these weak ties are less strong and active, this makes them more important than our strong ties in one crucial way. In this way, “the weak tie. . . becomes not merely a trivial acquaintance tie but rather a crucial bridge between the two densely knit clumps of close friends. . . these clumps would not, in fact, be connected to one another at all were it not for the existence of weak ties.” {Granovetter 1983@201-202}. Granovetter’s suggestion fits this context, and applied here it seems fair to suggest that these religious ENGO’s play a crucial role in connecting several networks (in this case the religious communities and environmental conservation NGOs) which would likely not be connected at all without this crucial bridge present.

[JK note: I’ll add an additional section here running the same analysis again and showing map without any of the 10 ENGO’s present to show the contrast]

2. Social Symmetries

A second calculation which is relevant to our inquiry is the degree of symmetry or asymmetry of communication. This relates essentially to reciprocation, and thus those who follow but aren’t followed may represent a less overall relevant node within a network.

Analysis 2: Sub-Group Connectivity, ECS Church Websites

Analysis 3: Outwards Connections, ECS Application Forms

Appendix a: Full Twitter Data

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Date (UTC)
26	oxfamgb8090	198176	24326	797	Oxford, UK	http://twitter.com/oxfamgb8090	Europe/GtA	Aug-08	

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Joined Date (UTC)
21	natures_4422e	148489	36250	1628	Sandy, UK	http://t.co/6wz1038Io1	London	Jan-09	
19	greenpeace	121071	17504	669	UK	http://t.co/6wz1038Io1	London	Apr-07	
18	wwf_uk3161	118890	15511	41931	Woking, UK	http://t.co/6wz1038Io1	London	Jan-09	
37	defragov656	76297	10953	129	UK	http://t.co/6wz1038Io1	London	Jun-09	
8	soilassoc2605n	70557	19955	4149	The UK and beyond	http://t.co/6wz1038Io1	London	Nov-08	
58	christian8450l	70101	17307	187		http://t.co/6wz1038Io1	London	Jan-09	
38	naturale681n	68480	8597	134	Sheffield, UK	https://t.co/6wz1038Io1	London	Sep-09	
40	wildlifet661s	55596	9706	5794	UK, Isle of Man and Alderney	http://t.co/6wz1038Io1	London	Jul-09	
59	c_of_e4378	47929	8890	249	London	http://t.co/6wz1038Io1	London	Feb-09	

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Joined Date (UTC)
35	birdlife_5819s	5819	37388	8267	2920	Cambridge UK	http://twitter.com/birdlife_5819s	GMT+01:00	Jul-09
71	catholic261hd	261hd	34628	15404	84		http://twitter.com/catholic261hd	GMT+01:00	Dec-08
22	38_degrees	7630	31692	9002	1237	Millions across the UK	http://twitter.com/38_degrees	GMT+01:00	Mar-09
46	bct	3164	24865	6697	1053	Vauxhall London UK	http://twitter.com/bct	GMT+01:00	Feb-09
23	buzz_dontweet	1770	21907	10826	561	UK	http://twitter.com/buzz_dontweet	GMT+01:00	Feb-11
69	churchtime	656	19569	6541	46		http://twitter.com/churchtime	GMT+01:00	Feb-09
6	transition2471	2471	17386	11516	1343	Everywhere	http://twitter.com/transition2471	GMT+01:00	Mar-09
24	mcsuk	1665	17213	9547	2321	Ross-on-Wye, Herefordshire	http://twitter.com/mcsuk	GMT+01:00	Jan-10
36	scotwild886	886	16107	2502	91	Edinburgh and Scotland	http://twitter.com/scotwild886	GMT+01:00	Nov-09

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Joined Date (UTC)
49	love_pla	2195	15595	5068	969	UK	http://t.co/0KQmQz	UK	Jan-11
72	cauknew	390	14924	7993	139	London	http://t.co/bXU3k	UK	Mar-09
3	robintra	1192	14642	13677	27	Totnes, Devon, UK	https://t.co/iIDJgDMjTL	UK	May-09
70	salvation	1444	14402	16614	2562	UK & Ireland	http://t.co/1ZC892SH	UK	Feb-09
25	frack_of	847	14296	9654	60		http://t.co/QY23	UK	Jun-11
7	peoplean	3533	12779	16676	1764	Oxford, UK	http://t.co/QZUY08h	UK	Oct-09
29	cafod	1320	11348	7230	1071	England & Wales	http://t.co/21k161Xoep	UK	Dec-08
28	rspbscot	1014	11058	5286	581	Scotland	http://t.co/EdyUMg0X2sVJn	UK	May-11
79	timesfai	10821	10040	1302	0	The Times, London	http://t.co/Avstwr3Bf	UK	Aug-10
75	gdnbelief	145	8845	7838	1	London	http://t.co/2585Z5U47v	UK	Feb-11

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Date (UTC)
66	biblesoc	268	8541	3674	61	England and Wales	http://twitter.com/biblesoc	London	139th Feb-09
65	methodia	626	8180	7042	164	London UK	http://twitter.com/methodia	London	221st May-09
20	oxfamscot	757	7675	21897	12419	Scotland	http://twitter.com/oxfamscot	Edinburgh	167th May-09
48	naturals	830	7466	3896	40	in wild bits of Scotland		London	31-Aug-09
30	foescot	1414	6741	10477	376	Edinburgh Scotland	http://twitter.com/foescot	Edinburgh	165th Jul-09
39	mscinth	710	6444	2988	1194	London United Kingdom	http://twitter.com/mscinth	London	185th Jun-12
52	greeners	256	6094	4167	12	Edinburgh	http://twitter.com/greeners	Edinburgh	258th Jul-09
27	wwf_uk	181	5677	7884	31	UK	http://twitter.com/wwf_uk	London	178th Sep-09
60	muslimn	292	5559	8376	21	England UK	http://twitter.com/muslimn	London	175th Jun-09
45	churchscot	966	4559	3425	114	Scotland	http://twitter.com/churchscot	London	149th Jun-11

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Joined Date (UTC)
5	ksbscotland	1183	4463	3373	661	Stirling, Scotland	http://twitter.com/ksbscotland	Edinburgh	Jul-08
54	ionacomunity	2114	4446	1321	6	Isle of Iona	http://twitter.com/ionacomunity	Edinburgh	Mar-09
33	britishqueers	2000	4329	2404	67	Great Britain	http://twitter.com/britishqueers	London	Feb-10
50	wildaboutplants	1807	4252	2064	597	National Australia	http://twitter.com/wildaboutplants	Australia	Jul-10
16	notarsand	1048	4250	10566	124	UK	http://twitter.com/notarsand	London	Mar-10
73	cafodwire	1808	3402	3573	126	London	http://twitter.com/cafodwire	London	Mar-09
9	andy2at	1883	3177	3795	253	London based. Here and there	http://twitter.com/andy2at	London	Oct-11
55	fairtradeunion	2371	2971	1783	470	Glasgow Scotland	http://twitter.com/fairtradeunion	Edinburgh	Feb-09
64	methrecorder	1888	2798	1069	5	122 Golden Lane, London EC1	http://twitter.com/methrecorder	London	Aug-09

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Date (UTC)
14	biggreen890	890	2622	2784	11	London, UK	http://t.co/dsR1ZzJpi	London	Nov-09
56	sciaf	571	2608	4922	727	Glasgow	http://t.co/0vjGFE29QV	Edinburgh	Jan-10
34	arcworld2649	2649	2554	1489	120	UK	http://t.co/47InFDgucv	London	Feb-09
81	baptistt326	326	2509	2282	19	Didcot	http://t.co/AUn2V6ijhYo	Amsterdam	Oct-09
63	baptistua349	349	2482	3401	32			Amsterdam	Jan-09
62	ctbi	1280	2411	4204	72		http://t.co/6mM7tLJ4tX	London	Feb-10
10	fossilfred372	372	2163	2300	1057	United Kingdom	http://t.co/xNjuDeZ7s	London	Apr-13
51	greener2640	2640	2087	1727	397	Scotland	http://t.co/6R1d21KPWu	London	Jan-12
67	urcmedia1106	1106	2070	1222	171	United Kingdom	http://t.co/nU4QhGKt	London	Jan-10
11	ssnscotland766	766	1948	1776	152	Stirling, Scotland	http://t.co/5DjDML2u4i	London	Jun-11
32	richard_419	419	1746	7683	7	Edinburgh		Edinburgh	Aug-11

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Joined Date (UTC)
4	transition645	645	1733	4567	4	60+ unis across the UK	http://t.co/d7h517Kjy	London	Jan-10
74	cafodpra619	619	1675	1468	44		http://t.co/llrBOwDdy	London	Feb-11
41	publiciss688	688	1487	4250	43	London	http://t.co/ldmY2857Fj	London	Jan-10
12	greenchr1204n_	1204	1361	4566	30	UK	http://t.co/salGZ5f8Z	Cardiff	Feb-12
42	cofecamp830	830	1325	1628	11	England	http://t.co/d3X9UMdv3z	London	Jun-10
17	scscot 827	827	1213	1122	392	Scotland	http://t.co/2BkrWQxs50	Edinburgh	Feb-14
80	secsynod82	82	1021	351	0	Scotland	http://t.co/salGZ5f8Z	Edinburgh	Jun-10
15	christian830	830	1019	1114	83	Scotland	http://t.co/EdjNvMGIYc2B8n	Edinburgh	Feb-11
76	coflifea67	67	847	1140	14		http://t.co/xmZNS1wSsN		Jan-10
13	miriamd705	705	817	6859	3998	Edinburgh	http://t.co/An/stc4Wk	Edinburgh	Sep-12

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Joined Date (UTC)
31	operation	386	795	908	45	UK	http://twitter.com/ky18	CGvP	Mar-09
83	fred_diamond	934	763	141	0				2-Aug-11
77	sicscotland	635	748	454	257	St Andrews University	http://t.co/pkji347rkm		Oct-13
61	churches	98	500	7233	2	England	http://twitter.com/stjv9I		Oct-12
44	ecocongregation	199	478	1543	1	Edinburgh	http://twitter.com/medlfi		Mar-09
53	arthurrace	255	426	375	5	Stoneleigh Park, Warwickshire	http://t.co/Gs64Bz	Fs2AY	Mar-10
47	arochauk	64	418	298	98		http://t.co/7eJ0L4M9Lu		Sep-13
57	ecengland	260	295	565	20		http://twitter.com/dun24		Apr-13
68	actscot	222	121	95	257	Alloa	http://t.co/bUn1BQUjog		Nov-14

ID	Vertex	Followed	Followers	Tweets	Favorites	Location	Web	Time Zone	Joined Date (UTC)
82	theconvener	91	121	140	0	Glasgow	http://twitter.com/theconvener	Edinburgh	Oct-09
78	tsa_scotland	201	119	337	0	12a Dryden Road, Loanhead EH20	http://twitter.com/tsa_scotland	London	Mar-10
43	ffkirkscotland	81	52	22	2	Scotland	http://twitter.com/ffkirkscotland	London	Aug-13
84	jrayl	23	4	0	0		http://twitter.com/jrayl	Pacific Time (US & Canada)	Apr-09

Appendix B: Full Graph Metrics

ID	Vertex (Twitter @Handle)	In-Degree	Out-Degree	Betweenness Centrality	Closeness Centrality
3	robintransition	9	5	4.025	0.006
4	transitionunis	12	10	18.353	0.007
5	ksbscotland	13	22	64.384	0.007
6	transitiontowns	19	20	74.179	0.007
7	peopleandplanet	30	12	144.455	0.008
8	soilassociation	23	7	42.843	0.007
9	andy2atkins	21	27	117.878	0.008
10	fossilfree_uk	12	15	18.252	0.007

ID	Vertex (Twitter @Handle)	In-Degree	Out- Degree	Betweenness Closeness	
				Central- ity	Central- ity
11	ssnscotland	13	24	58.311	0.007
12	greenchristian_	19	58	973.237	0.01
13	miriamdobson	6	20	50.377	0.007
14	biggreenjewish	5	18	33.362	0.007
15	christianaidscot	19	29	181.776	0.008
16	notarsands	11	11	6.039	0.006
17	sccscot	22	32	161.144	0.008
18	wwf_uk	34	15	154.77	0.008
19	greenpeaceuk	33	12	201.979	0.008
20	oxfamscotland	17	10	31.969	0.007
21	natures_voice	27	15	69.186	0.008
22	38_degrees	12	6	12.897	0.007
23	buzz_dont_tweet	18	21	24.035	0.007
24	mcsuk	17	21	26.22	0.007
25	frack_off	14	4	9.157	0.007
26	oxfamgb	26	5	126.571	0.008
27	wwf_uk_politics	15	15	48.283	0.007
28	rspbscotland	19	26	56.571	0.007
29	cafod	16	15	41.483	0.007
30	foescot	22	28	99.544	0.008
31	operationnoah	23	34	375.604	0.008
32	richard_dixon	16	11	16.602	0.006
33	britishquakers	13	13	29.595	0.007
34	arcworld	11	17	32.505	0.007
35	birdlife_news	12	7	7.401	0.007
36	scotwildlife	17	16	16.908	0.007
37	defragovuk	24	9	29.309	0.007
38	naturalengland	21	14	28.602	0.007
39	mscintheuk	12	9	5.801	0.007
40	wildlifetrusts	21	8	22.625	0.007
41	publicissues	13	18	24.635	0.007
42	cofecampaign	16	33	142.963	0.008
43	ffkirkscotland	4	6	1.7	0.006
44	ecocongregation	24	32	250.675	0.008
45	churchscotland	22	21	115.148	0.007
46	<i>bct</i>	14	21	22.28	0.007

ID	Vertex (Twitter @Handle)	In-Degree	Out- Degree	Betweenness Closeness	
				Central- ity	Central- ity
47	arochauk	7	12	9.57	0.007
48	naturalscotland	11	14	7.88	0.007
49	love_plants	18	14	28.457	0.007
50	wildaboutplants	10	22	17.465	0.007
51	greener2gethr	11	15	9.091	0.007
52	greenerscotland	17	14	37.626	0.007
53	arthurrankcentr	7	15	58.347	0.007
54	ionacommunity	15	10	41.144	0.007
55	fairtradenation	8	7	2.356	0.006
56	sciaf	15	15	52.83	0.007
57	ecenglandwales	7	17	22.307	0.007
58	christian_aid	37	15	224.759	0.008
59	c_of_e	30	10	84.382	0.008
60	muslimness	3	4	0.179	0.006
61	churchesengland	11	15	7.862	0.006
62	ctbi	26	36	145.281	0.008
63	baptistuniongb	14	14	11.615	0.007
64	methrecorder	9	15	11.623	0.007
65	methodistmedia	24	15	32.847	0.007
66	biblesociety	14	7	13.078	0.006
67	urcmedia	18	20	33.035	0.007
68	actscot	9	21	48.395	0.007
69	churchtimes	21	22	99.503	0.008
70	salvationarmyuk	14	14	36.584	0.007
71	catholicherald	14	3	12.752	0.007
72	eauknews	18	16	55.214	0.007
73	cafodwire	11	14	16.886	0.007
74	cafodprayer	6	10	3.781	0.006
75	gdnbelief	16	3	16.388	0.007
76	cofslifeandwork	13	13	17.08	0.006
77	sicscotland	7	11	9.557	0.006
78	tsa_scotland	7	18	19.974	0.006
79	timesfaith	8	2	1.919	0.006
80	secsynod	10	10	8.046	0.007
81	baptisttimes	11	9	2.686	0.006
82	theconvener	4	5	0.537	0.006

ID	Vertex (Twitter @Handle)	In-Degree	Out- Degree	Betweenness Central- ity	Closeness Central- ity
83	fred_drummond	9	8	5.329	0.006
84	jrayl	0	0	0	0
