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Mapping the Scottish university football system, a dual performance model based on sport and school

Alexandru ILIEȘ¹, Tudor CACIORA^{2*}

1. University of Oradea, Faculty of Geography, Tourism and Sport, 1 University st., 410087 Oradea, Bihor, Romania, e-mail: ilies@uoradea.ro
2. University of Oradea, Faculty of Geography, Tourism and Sport, 1 University st., 410087 Oradea, Bihor, Romania, e-mail: tudor.caciora@yahoo.com

* Corresponding author

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Abstract: For students at University studying towards an academic level professional qualification, practicing a sport in an organized manner provides a complementary activity to their studies. The Scottish model, which is administered through BUCS, is the case study and it is argued can be considered a successful model which can be applied to other academic environments. Through specific cartographic representation methods, through qualitative and quantitative spatial analysis tools, and a systemic approach, the geography of sports generates useful solutions in the territorial planning and organization policies and strategies.

Keywords: BUCS, Scotland, football team, university competitions, Sport geography

Introduction

The increasing number of universities in the world and the rising percentage of people with higher education provide opportunities for the promotion of a dual form of academic life based on the practicing of a sport in an organized manner, together with the professional academic formation (Tight, 2002; Donnor, 2005; Christensen and Sørensen, 2009; Gayles and Hu, 2009; Böheim and Lackner, 2012). This combination of higher education and sport has been shown to have economic benefits (Humphreys, 2006; Kijewski and Wendt, 2019; Oros and Hantiu, 2018). The tradition of university sport has a long history in the UK as a whole (Moorhouse, 1995) and Scotland in particular (Anderson, 1987; Bradley, 1995). The

organizational body, the British University & College Sport (BUCS)¹ can be considered an example of a “professional organization” structure in an amateur sport environment. The objective in this article is to map the Scottish university football system and thereby generate a set of model maps which are representative of the geography of sports and of territorial planning. The study is informed by use of methods of spatial analysis (Bale, 2003; Buhaş et al., 2015; O'Brien and Cheshire, 2015) and tools of cartographic representation through which a suggestive image (Cartwright and Ruas, 2015; Ilieş et al., 2015) can be formed which shows the main qualitative and quantitative elements that form the territorial system of Scottish university football. It has been observed for example that the “University of St. Andrews football programme fosters a healthy relationship between athlete and student. Our players graduate with a world class education, an exceptional sporting experience and teammates for life”². The results of this study can be useful in territorial planning policies and strategies.

Methodology

As is demonstrated in international literature, geographical analyses are important in understanding sport (Bale, 2003). Key geographical concepts can be applied to sport such as space and place; location and landscape; spatial diffusion and mapping. The creation of a database from online sources^{3;4;5} managed through ArcGIS represents one way of analysing the spatial dimensions of a sporting phenomenon which is made up of static and dynamic inter-related elements (Reilly and Gilbourne, 2003; Buhas, 2015). The cartographic outputs produced through this process can contribute to territorial planning and organization policies from a local level to a regional level (Robinson et al., 2017; Murphy, 2019), as well as even at a national and continental level (Wendt and Scutti, 2016). Several studies have demonstrated the utility of applying methods of spatial analysis (Ilieş et al., 2015; Kozma et al., 2015; Gartner and Huang, 2016; Ilieş et al., 2016; Rotar and Ursu, 2019) to the geography of sports (Conner, 2014; Ilieş et al., 2014). Researchers use quantitative and qualitative elements (Griffin et al., 2017; Dehoorne et al., 2019) to generate a complex data base and cartographies series (Herman et al., 2016; Ilieş et al., 2016) with useful results and with high spatial visibility. A wide variety of factors are considered in such studies including those related to universities, their sports clubs, sports infrastructure, competitions, human resources, performances, spatial distribution, indicators (I_{fp} -index of football practicing), typologies and hierarchies, tools of analysis (Bulz and Ilieş, 2017) and impact in society (Bairner, 2011). All these factors are very useful in deciphering the mechanisms which make up and generate a functional specific territorial system.

Analysis

Considering the complexity of the British sports system, Scotland was selected as a case study for this paper. The spatial analysis considers information generated by the competitions organized by BUCS for the 2019-2020 seasons, referring to Scottish professional⁶ and amateur football⁷. Three key components are under investigation: the human resource (represented by players and teams), specific infrastructure, and competitions.

The organization of Scottish professional football⁶. Scotland has a total population of 5,454 million inhabitants with a density of 45 inhabitants/km². As shown on Figure 1 Scottish football is organized across 5 levels⁵. Amateur football is included in the 5th level with two series and 7 levels of the university championship⁴. The overall map of Scottish football reveals that there are 36 localities with 42 teams (fig.1) with 31 localities having only one team. The exceptions are Glasgow 8 (4Men`s+4Women`s), Edinburgh 5 (3M+2W), Forfar 2 (1M+1W) and Motherwell 2 (1M+1W). Out of the total of 19 Scottish universities, only Stirling⁸ and Glasgow⁹, along with BUCS, have teams also registered in the amateur Highland League (League 4)¹⁰.

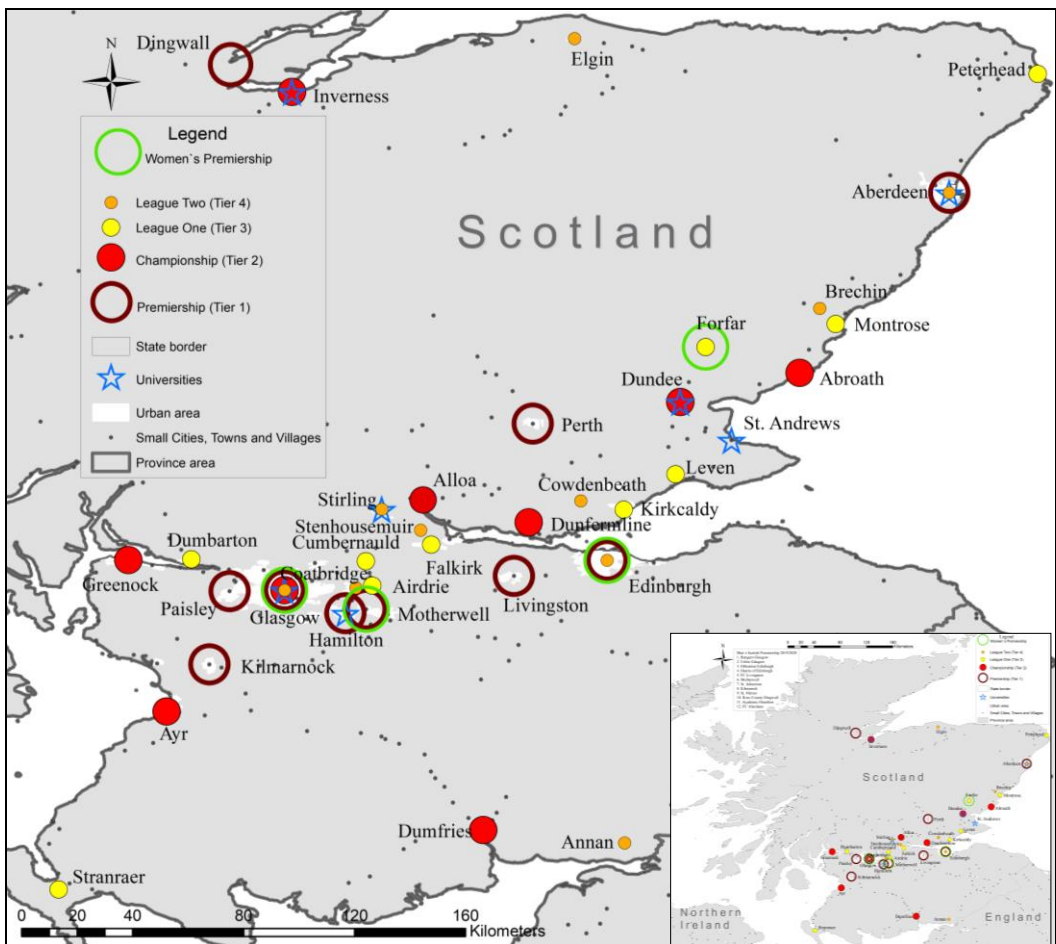


Figure 1. Scottish centres and professional and universities football teams, season 2019/2020⁵

By overlapping the two male university categories of professionals and amateurs, it is observed that there are 8 localities with university football which are represented in Premiership 5, Championships 1 (Inverness), Stirling in League 2 and Highland League, while St. Andrews is represented only on amateur level. The fact that the 15 universities from BUCS are located in the main football-active localities of Scotland (figure 1), emphasizes the study’s core idea concerning the duality which is promoted through university football, sport and education. The existence of

important clubs in the locality means that there is an important resource of young sports individuals who can continue their activity in the university championships. On the professional female football level, only four localities are represented in the first Scottish League, half of the teams being in Glasgow (4).

Human resource: Number of sporting students. In the 2019/2020 academic year, a total of 231,335 students¹¹ (5.1% from total population) attended one of the country's 19 universities and 15 of those universities have football teams. The largest universities in Scotland in terms of numbers of studies are Edinburgh (34,275), Glasgow (30,800) and Glasgow Strathclyde (22,640) (table 1). The universities without football teams in BUCS competitions (2019/2020) include: Scotland's Rural College Edinburgh, Royal Conservatoire of Scotland of Glasgow; The Open University in Scotland of Edinburgh; and Glasgow School of Arts.

Table 1. Scottish Universities and human resources in 2019¹; 4; 11

no	Universities & Colleges	Number of students			Number of players			Number of teams			The Football Practicing Index (I _{fb})		No students/team	
		Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women		Total
1	Aberdeen Robert Gordon University	4735	7600	12335	83	29	112	3	1	4	1.75	0.38	0.91	28
2	Aberdeen University	6135	8640	14775	135	40	175	5	1	6	2.20	0.46	1.18	29
3	Dundee Abertay University	2215	2140	4355	145	23	168	3	1	4	6.55	1.07	3.86	42
4	Dundee University	5640	10275	15915	107	35	142	5	1	6	1.90	0.34	0.89	24
5	Edinburg Heriot-Watt University	6540	4395	10935	55	22	77	6	1	7	0.84	0.50	0.70	15
6	Edinburg Napier University	6025	7570	13595	39	12	51	3	1	4	0.65	0.16	0.38	17
7	Edinburgh Queen Margaret University	1230	3995	5225	10	0	10	1	0	1	0.81	0.00	0.19	10
8	Edinburgh University	13355	20920	34275	118	88	206	6	3	9	0.88	0.42	0.60	26
9	Glasgow Caledonian University	9185	7675	16860	52	25	77	2	1	3	0.57	0.33	0.46	26
10	Glasgow Strathclyde University	10885	11755	22640	100	31	131	4	1	5	0.92	0.26	0.58	26
11	Glasgow University	12265	18540	30805	184	89	273	3	2	5	1.50	0.48	0.89	55
12	Hamilton University of the West of Scotland	6180	10845	17025	67	0	67	3	0	3	1.08	0.00	0.39	22
13	Inverness University of the Highlands and Islands	3720	5775	9525	10	0	10	1	0	1	0.27	0.00	0.10	10
14	St. Andrews University	4355	6215	10570	121	61	182	6	3	9	2.78	0.98	1.72	20
15	Stirling University	4447	8053	12500	104	70	174	5	3	8	2.34	0.87	1.39	22
Colleges														
16	Cumbernauld New College Lanarkshire							1						
17	Edinburgh College							1						
18	Glasgow College City							2						
19	Glasgow Kelvin College							1						
20	Glasgow Clyde College							1						
21	Livingston West Lothian College							1						
	TOTAL	96912	134393	231335	1330	525	1855	63	19	82	1.37	0.39	0.80	25
	%	42%	58%	100%	71.7%	28.3%	100	69%	31%	100%				
	%													

The football practicing index (table 1; figure 2), illustrates the total number of male and female students engaged in football relative to the student body as a whole. It shows some key results. When compared with the average value of 0.8, the football practicing index is high in the following universities: Abertay (3.86), St. Andrews (1.72), Stirling (1.39) and Aberdeen (1.18); a very low practicing index is recorded in Queen Margaret (0.19). Table 1 also shows that there are consistent differences across genders with a higher football practicing index for males. For example, Dundee Abertay University has a male – female ratio with 6.55 for male students and 1.07 for female students. Regarding the number of sports students/team (table 1), there are also differences between universities, as well as between teams of the same institution. The formation of lots occurs according to the performance level and students' option. Compared to an average of 33 students/team, the most consistent lots are universities Abertay 84 and Dundee 71, while Napier 17 and Heriot-Watt only 13.

Figure 2 shows that the largest number of football playing students were in the following universities, most importantly Glasgow 273 (0.89) and Edinburgh 206 (0.6). Differences are observed in terms of gender: males in Glasgow 184/3 teams (1.5) and Abertay 145/3 teams (6.55), while females in Glasgow 89/2 teams (0.48), Edinburgh 88/3 teams (0.42) and Stirling 70/3 teams (0.87). In Scotland 58 % of students are women. Nevertheless, the football practicing index is not surprisingly much lower for women than for men. The gender differentiation is also reflected in terms of data concerning number of men’s as opposed to women’s teams in Scottish football (figure 2).

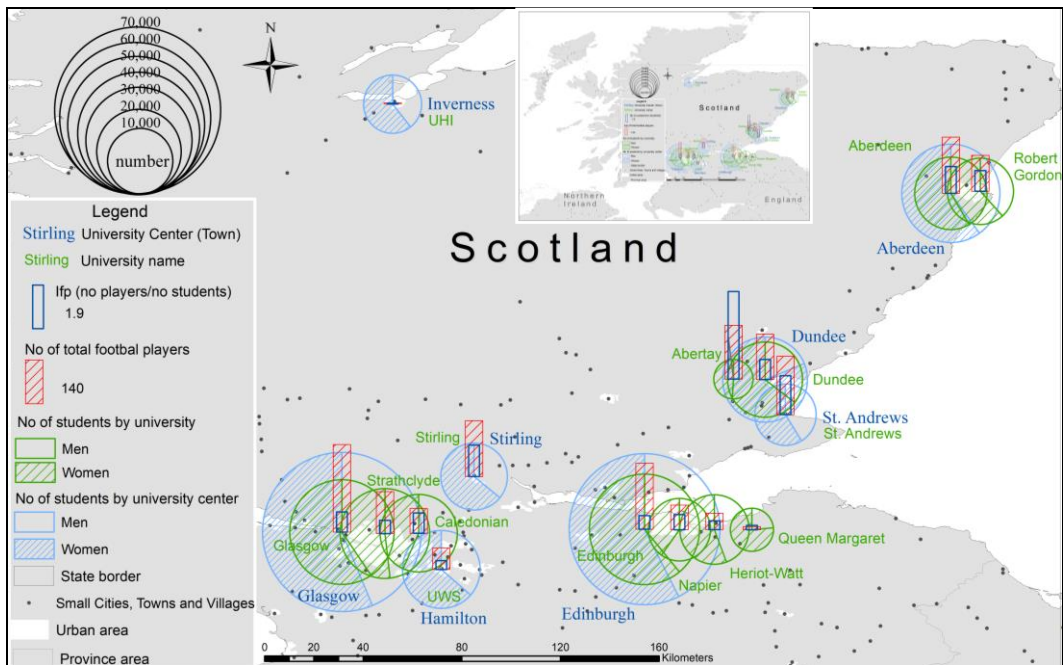


Figure 2. Scottish University centers and universities: number of students, football players and index of football practicing (Ifp) universities football teams, season 2019/2020^{4, 11}

Infrastructure. The organization of a university championship supported by BUCS indicates the existence of formal infrastructure. The 21 institutions which have a total of 82 male and female teams benefit from an infrastructure which includes 94 football pitches (table 2; figure 2.1-16) at the universities’ own sports grounds. As is shown on table 2 other football pitches are added to this infrastructure. Some belong to local communities, others to partner football clubs and some which are rented.

University centers and university campuses have sports complexes which include numerous grass or synthetic pitches, indoor pitches, and sports halls, Table 2 and figures 2.1-16^{3, 4} present a profile concerning the situation of the football pitches for the 21 institutions (8 university centers and 6 colleges) registered in competitions. The map of official playing pitches includes 25 locations^{3, 4} (table 2). Eight universities have their own sports centers with an impressive number of pitches (94), an average of 8 pitches per institution. The largest complex (tables 1 and 2) is that of Dundee University¹² (12,335 students; figure 2.10).

Table 2. Scotland's universities sport complexes^{3; 4}

No	Town	University	Teams		Stadiums		
			Men's	Women's	Name Owner: University / Others partners	No of pitches	Figure no.
1	Aberdeen	The University of Aberdeen	1		Hillhead Centre (Aberdeen University FC)	2	2.3
			2, 5	1	Balgownie Playing Fields	9	2.2
				1	Sport Village; Spain Park (Banks O'Dee Football Club)	3	2.4
2	Aberdeen	The Robert Gordon University	1		Balmoral Stadium (Cove Range FC)	3	2.1
			2, 3	1	Snowsports Centre	3	
3	Cumbernauld	New College Lanarkshire	1		Broadwood Stadium	2	2.16
4	Dundee	University of Abertay	1		Whitton Park	1	
			3		GA Arena	1	
				1	Craigie Community Sports Arena	8	2.9
5	Dundee	The University of Dundee	1, 4	1	Riverside Sports Ground (University)	18	2.10
6	Edinburgh	Napier University	1	1	Ainslie Park Stadium: Spartans CFA	2	
7	Edinburgh	The University of Edinburgh	1, 4	1, 2, 3	Sport & Exercise Peffermill (University)	10	2.5
8	Edinburgh	Heriot-Watt University	1, 2	1	Oriam Sport Complex Currie	8	2.6
9	Edinburgh	Queen Margaret University			Sport & Exercise Peffermill (University of Edinburgh)		2.5
					Firhill Complex;	1	
					Springburn Park;	1	
					Petershill Park (Petershill FC)	1	
10	Glasgow	Caledonian University	1	1	Green Football Center	9	2.15
11	Glasgow	The University of Glasgow	1, 3	1, 2	Garscube Sport Complex	8	2.14
12	Glasgow	The University of Strathclyde	1-4	1	Steeps Playing Fields (University)	10	2.13
13	Glasgow	City of Glasgow College	1		Green Football Center		
14	Glasgow	Clyde Langside College	1		Green Football Center		
15	Glasgow	Kelvin College	1		Petershill Park (Petershill FC)		
16	Hamilton	The University of the West of Scotland (UWS)	1, 3		Palace Sports Grounds (University)	8	2.11
17	Livingston	West Lothian College	1		FC Toni Macaroni Arena	2	
18	St Andrews	The University of St Andrews	1, 5	1, 2, 3	University Sports Centre	12	2.12
19	Stirling	The University of Stirling	1, 2, 3, 4	1, 3	University Airthrey Sport Centre	5	2.7
				2	Stirling Sport Village	3	2.8

Institutions and teams. The organization of competitive football for both men and women teams allows each institution to have a visibility through its registered male and female teams and players. In the 2019/2020 season, the Scottish university football map included 9 localities, 15 universities and 6 colleges with a total of 82 teams. Out of this total of 82 teams 63 are men's teams and 19 women's teams. In total 12 institutions are represented in both men's and women's competitions, while 9 institutions are represented only in men's competitions. On an institutional level, Edinburgh¹³ with nine teams has the most. In the men's competitions, there are 63 teams registered, belonging to 21 institutions which differ in terms of the participation value level and the number of registered teams. As an order, Edinburgh¹³, St. Andrews² and Heriot Watt¹⁴ have 6 teams each, followed by Stirling⁸, Dundee¹² and Aberdeen¹⁵ which all have 5 teams each; Strathclyde¹⁶ has 4 teams and then Abertay¹⁷, Glasgow¹⁸, Napier¹⁹, Robert Gordon²⁰ and UWS²¹ all have 3 teams each. Further, two other institutions, namely Caledonian²² and Glasgow College City²³, have 2 teams and 7 institutions have one team each - Universities Queen Margaret²⁴ and Inverness UHI²⁵ and 5 colleges: New College Lanarkshire²⁶, Glasgow Kelvin²⁷, Clyde Langside²⁸; West Lothian²⁹, Edinburgh College³⁰ (table 1).



Figure 2.1. Aberdeen Robert Gordon University: *Balmoral Stadium* (source: [google.com/maps/place/Balmoral+Stadium/](https://www.google.com/maps/place/Balmoral+Stadium/); 2019)



Figure 2.2. University of Aberdeen: *Balgownie Playing Fields* (source: [google.com/maps/place/Balgownie+Playing+Field/](https://www.google.com/maps/place/Balgownie+Playing+Field/); 2019)



Figure 2.3. University of Aberdeen: *Hillhead Centre* (source: [google.com/maps/place/Hillhead+Centre/](https://www.google.com/maps/place/Hillhead+Centre/); 2019)



Figure 2.4. University of Aberdeen: *Sport Village* (source: <https://www.google.com/maps/place/Aberdeen+Sport+Village/>; 2019)



Figure 2.5. University of Edinburgh (and Queen Margaret University): *Sport & Exercise Peffermill* (source: [google.com/maps/place/peffermill+Playing+Fields,+The+University+of+Edinburgh/](https://www.google.com/maps/place/peffermill+Playing+Fields,+The+University+of+Edinburgh/); 2019)



Figure 2.6. Edinburgh. Heriot-Watt University: *Oriam Sport and Exercise Complex* (source: <https://www.google.com/maps/search/Heriot-Watt+University+Sport+and+Exercise/>; 2019)



Figure 2.7. Stirling University: *Airthrey Sport Centre* (source: <https://www.google.com/maps/search/Airthrey+Pitches/>; 2019)



Figure 2.8. Stirling. *Sport Village: Forthbank Stadium* (source: <https://www.google.com/maps/place/Forthbank+Arena+Stirling/>; 2019)



Figure 2.9. Dundee University of Abertay: Craigie Community Sports Arena (3G) (source: [google.com/maps/place/Craigie+Community+Sports+Arena+\(3G\)/2019](https://google.com/maps/place/Craigie+Community+Sports+Arena+(3G)/2019))



Figure 2.10. University of Dundee: Riverside Sports Grounds, Institute of Sports & Exercise (ise), (source: [google.com/maps/place/Riverside+Sports+Grounds,+Institute+of+Sport+%26+Exercise+\(ise\),+Uni+of+Dundee/](https://google.com/maps/place/Riverside+Sports+Grounds,+Institute+of+Sport+%26+Exercise+(ise),+Uni+of+Dundee/))

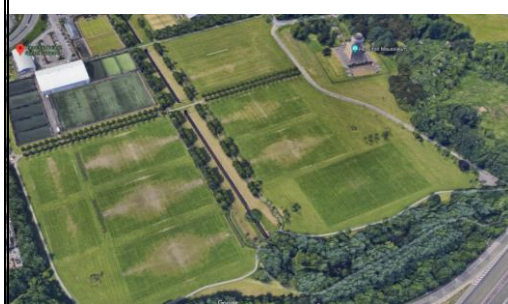


Figure 2.11. Hamilton University of The West of Scotland (UWS): Palace Sports Grounds (source: google.com/maps/place/Hamilton+Palace+Sports+Grounds/; 2019)



Figure 2.12. St. Andrews University: Sports Centre (source: google.com/maps/place/University+Sports+Centre/)



Figure 2.13. Glasgow University of Strathclyde: Steeps Playing Fields (source: google.com/maps/place/University+Of+Strathclyde/; 2019)



Figure 2.14. Glasgow. University of Glasgow: Garscube Sport Complex (source: google.com/maps/place/Garscube+Sports+Complex/, 2019)



Figure 2.15. Glasgow (Caledonian University), Glasgow Green Football Centre (source: google.com/maps/place/Glasgow+Green+Football+Centre/; 2019)



Figure 2.16. Cumbernauld: New College Lanarkshire: Broadwood Stadium, (source: google.com/maps/place/Broadwood+Stadium/; 2019)

In women’s competitions, Edinburgh, Stirling and St Andrews have the most teams with 3 teams each. In an order, Glasgow follows them with 2 teams and 8 other institutions have one team each. The focus shifts now from quantitative issues of numbers of teams to qualitative issues in regards to the competitive leagues. Figure 3 and 4 map the key spatial aspects of this competitive landscape. In the first 4 leagues, the 18 teams represent 11 institutions in men’s competitions and in women’s competitions, 6 institutions are represented in the first two tiers. The best performing institutions are: Stirling⁸, winner of Premier League North in men and 5th place in women and Edinburgh¹³ which, out of the 8 teams, has 4 teams in the first 4 leagues (1 men’s tier 1 team and 3 women’s teams, one of them being in Premier League); the remaining 4 teams of Edinburgh are in the male leagues 4 and 5. Glasgow is the third ranked in terms of qualitative performance with 5 teams (men and women in T1-3).

Competition systems. In the competition system of BUCS, the participating teams are distributed in leagues and knockout competitions (figure 3-5; table 3).



Figure 3. United Kingdom. Premier League North and South⁴

Table 3. Scotland. Universities football teams and BUCS competitions^{1; 4; 5}
(the colors from the table are in according with legends of the figures 6-10; M-men's team; W-women's team)

I	Championship Cup (M;W)		Trophy Scottish (M;W)	Scottish Conference Cup (M;W)				Conference Plate (M)		no	n o
	South	North		Tier One (L2)	Tier Two (L3)	Tier Three (L4)	Tier Four (L5)	Tier Five (L6)	Tier Six (L7)		
	Premier League										
1M	1.Hartpury1	1.Stirling 1	6.Stirling 2		1.Stirling 3	4.Stirling 4	4B.Stirling 5		1-5	5	
1W		4.Stirling 1	5.Stirling 2		3.Stirling 3				1-3	3	
1T										7	
	2.Cardiff1	2.Nottingham1									
	3.Swansea1	3.Loughborough1									
	4.USW1	4.Durham1									
	5.Bath1	5.Northumbria1									
	6.Exeter1	6.Birmingham1									
2M			1.Edinburgh 1			2.Edinburgh2 5.Edinburgh3	1B.Edinburgh (4)	1.Edinburgh 5 6.Edinburgh (IM)6	6-11	6	
2W		5.Edinburgh 1	3.Edinburgh 2		1.Edinburgh 3				4-6	3	
2T										8	
3M			2.Aberlay 1			4B. Aberlay 2	6C. Aberlay 3		12-14	3	
3W			6.Aberlay 1						7	1	
3T										2	
4M			3.Glasgow 1	6.Glasgow 2	3.Glasgow 3				15-17	3	
4W			2.Glasgow 1		2.Glasgow 2				8-9	2	
4T										5	
5M			4.Robert G. 1		6.Robert G. 2		1C.Robert G.3		18-20	3	
5W				3.Robert G. 1					10	1	
5T										4	
6M			5.Aberdeen 1		4.Aberdeen 3	2B Aberdeen 2 6B. Aberdeen 4	3C.Aberdeen 5		21-25	5	
6W			4.Aberdeen 1						11	1	
6T										3	
7M				1.Heriot Watt 1	5.Heriot Watt 2		3.BHW 3	3.Heriot Watt 4 2.Heriot Watt 5 7.Heriot Watt 6	26-31	6	
7W				6.Heriot Watt 1					12	1	
7T										6	
8M				2.Napier 1			2B.Napier 2	4.Napier 3	32-34	3	
8W				Napier 1					13	1	
8T										3	
9M				3.Strathclyd 1	2.Strathclyde 2	3.Strathclyde 3	2.Strathclyde 4		35-38	4	
9W				1. Strathclyd 1					14	1	
9T										5	
10M				4.Dundee 1		5B Dundee 2	2C Dundee4 5C Dundee 3 9C. Dundee5		39-43	5	
10W				4.Dundee 1					15	1	
10T										2	
11M				5.St Andrews 1		1B. St Andrews 2 3B. St Andrews 3	4C. St. Andrews 4 8C. ST Andrews 5 7C. St Andrews 6		44-49	6	
11M			1.St Andrews 1	5.St Andrews2	6.St Andrews3				16-18	3	
11T										4	
12M						1.G.Caledonian 1	4.G.Caledonian 2		50-51	2	
12W					4.Caledonian 1				19	1	
12T										3	
13M						6. UWS 1	7.UWS 3 8.UWS 2		52-54	3	
14M							1.New College Lanarkshire 1		55	1	
15M							3.Glasgow Kelvin 1		56	1	
16M							5.City of Glasgow College 2 6. City of Glasgow College 1		57-58	2	
17M							9.Glasgow Clyde Langside 1		59	1	
18M								5.West Lothian1	60	1	
19M							6BQueen Margaret1		61	1	
20M							5B.EdinburgCollege1		62	1	
21M							10C.Inverness UHI1		63	1	

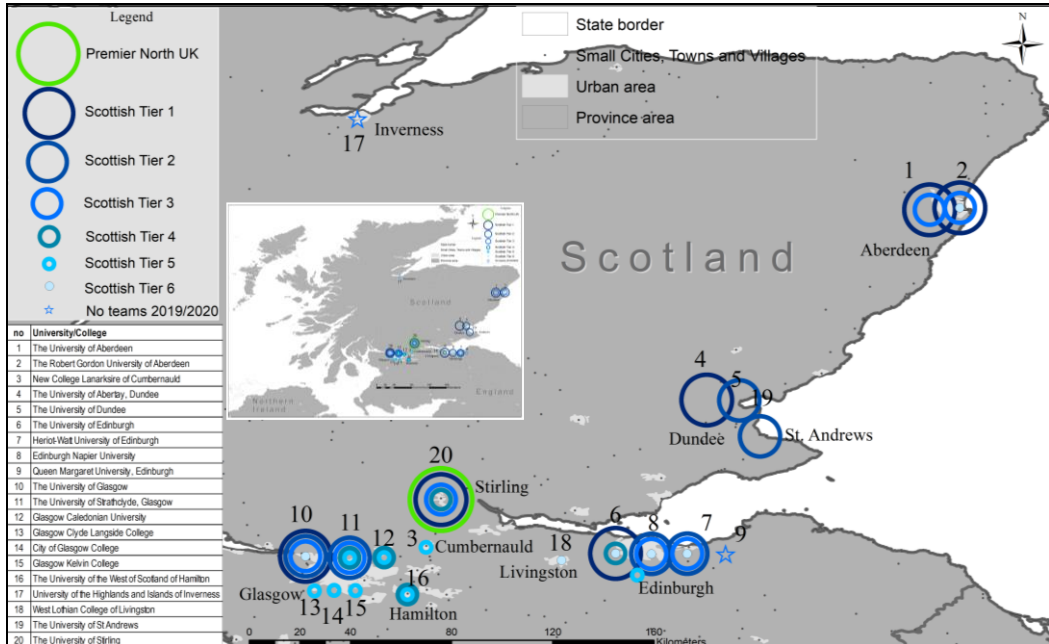


Figure 4. The Scottish Men's teams from UK Premier North and Scottish Tiers 1-6^{1:4}

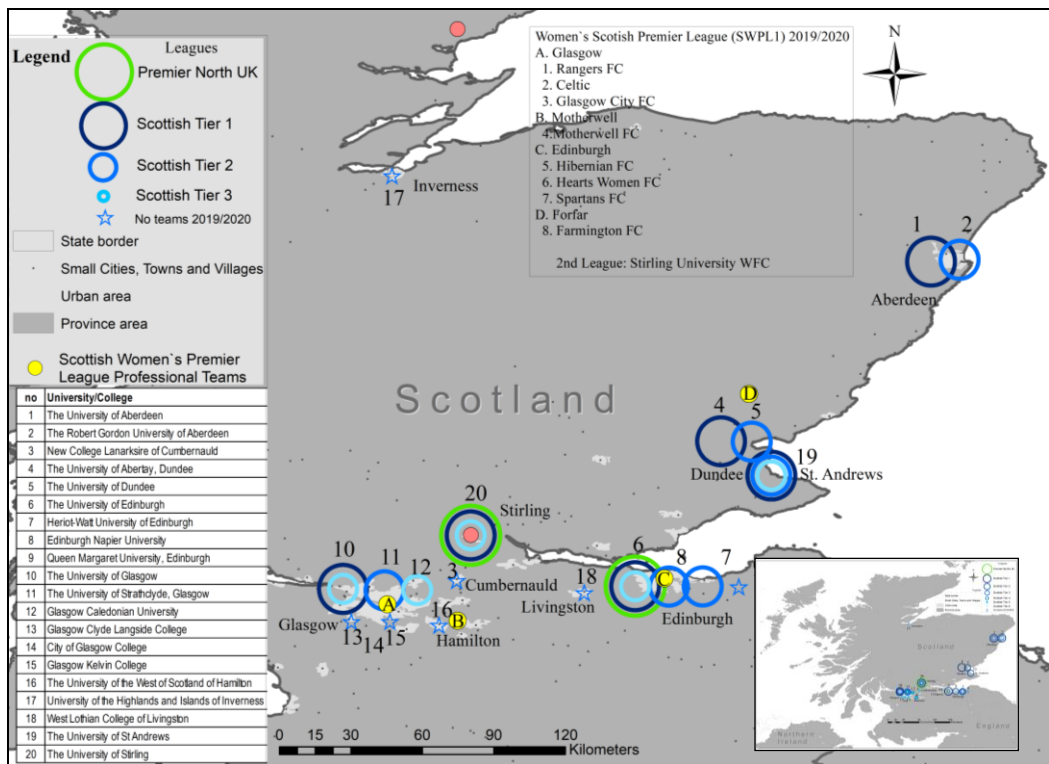


Figure 5. The Scottish Women's teams from UK Premier North and Scottish Tiers 1-3^{1:4}

A) Leagues. According to BUCS regulations (reg. 5)³¹, in the first three leagues (National League, Premier League and Championship), the institutions can register a maximum of 1 team (unless they are in different campuses). On a national Scottish level, together with United Kingdom Premier League North, there are (table 3; figure 3-5):

- 7 levels for men with 63 teams, representing 21 institutions (15 universities and 6 colleges) from 9 university centers;
- 4 levels for women with 19 teams, representing 12 universities from 6 university centers.

Starting with the 2nd level in the hierarchy, the other 6 men's leagues and 3 women's leagues (with a series of 6-9 teams) are formed exclusively by Scottish teams (figure 3-5). It should be noted also that many university teams participate regularly in other local amateur competitions.

B) Knockout competitions are organized for male and female teams. These are structured across 4 categories according to their level in the leagues. These knockout competitions usually take place in parallel with the regular championship (October-April). The highest level of competitions is organised on a UK level and the lower level knockout competitions are geographically confined to Scotland. This means that the knockout competitions can be grouped as follows (table 2; figure 1):

- 4 Competitions organized on UK level: Men's and Women's Championships (Premier League) and Men's and Women's Trophy (Leagues 1 and 2);
- 5 Competitions organized on Scotland's level: Women's and Men's Queen's Park Shield Cup Men's (First team of university), Women's Conference Cups (Leagues 3-5) and Men's Conference Plate (Leagues 6-7). It is observed also that many university teams participate regularly in Scottish Cup and other different local amateur competitions.

Championship⁴ includes the first teams, male and female, of the universities participating in North and South Premier Leagues from the UK.

In the most recent football season (2019/2020), February-March, 12 teams from Men's Premier League were registered (figure 6). From the Scottish universities, only one team was registered in the Championship, Stirling 1 University. This team performed well, reaching the semifinal where it lost (0-2) against the Welsh team Cardiff Met1.

In the *women's competition*, out of the 12 participating teams, the first teams of Stirling1 and Edinburgh1 universities represented Scotland; both teams participated in Premier League North. Figure 7 shows that both of these teams were eliminated in the first round of the competition.

Trophy Cup⁴ is the second tier knockout competition with teams registered in the 5 series of the first league and is extended across the UK territory (figure 6). The participants are usually, both for men and women, the 6 teams from Scotland's League 1 (Scottish Tier 1).

In the men's competition (figure 6, table 3), we find the second team of the University of Stirling and the first teams of the Aberdeen, Abertay, Edinburgh, Glasgow and Robert Gordon universities; 5 university centers being thus represented. Their relative performances are shown on Figure 6 and Table 3.

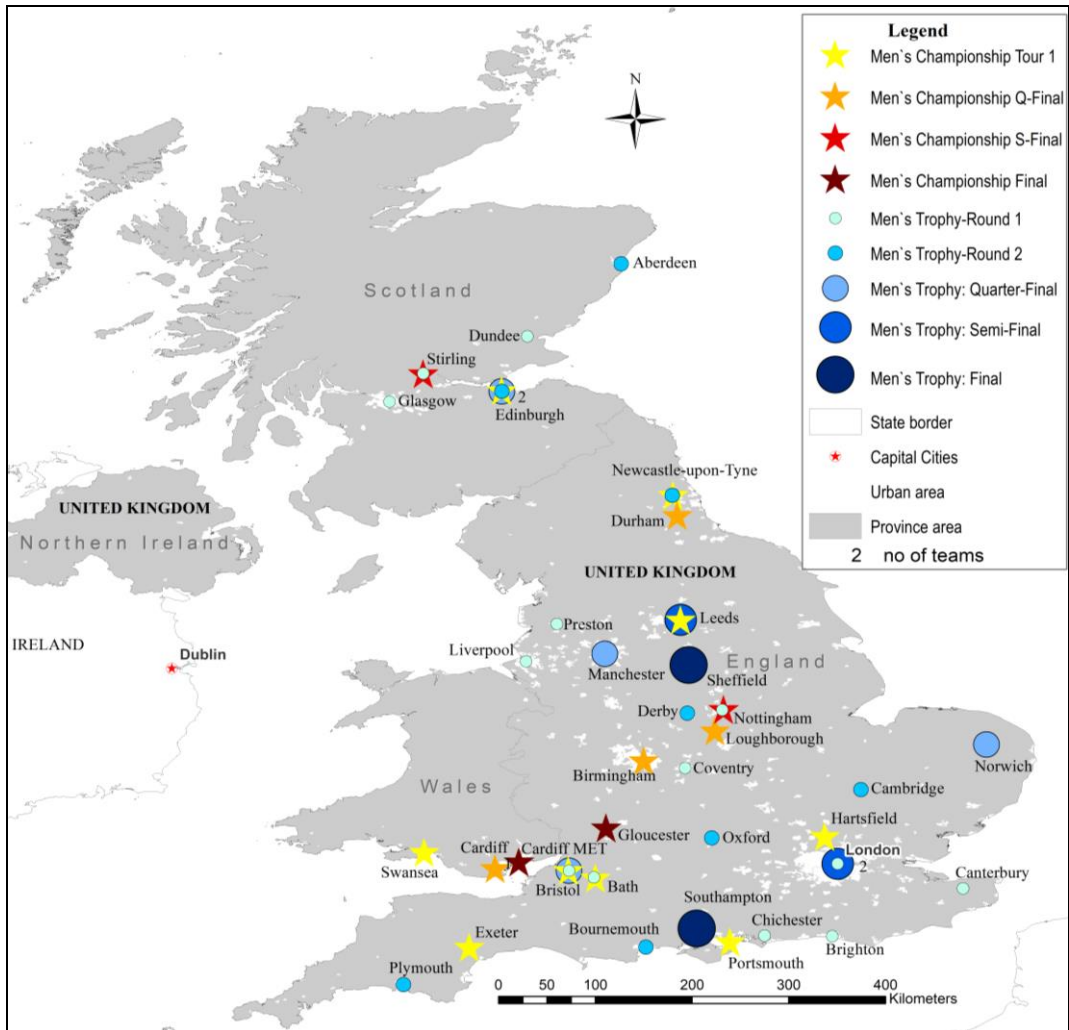


Figure 6. United Kingdom: Men`s Championship and Men`s Trophy Cups, 2019/2020 season⁴

In the parallel women's competition (figure 7; table 3), among the 30 registered teams, there were teams from Scottish League 1, representing 6 university centers and the same number of universities. Their relative performances are shown on Figure 7 and once again, on Table 3.

In addition to the two national competitions which are confined to Scotland, the Scottish university teams, registered in Scottish Leagues 2-7 (figure 1) also participate in the Men`s and Women`s Conference Cups (teams from leagues 2-4) and Men`s Conference Plate (teams from leagues 5-6).

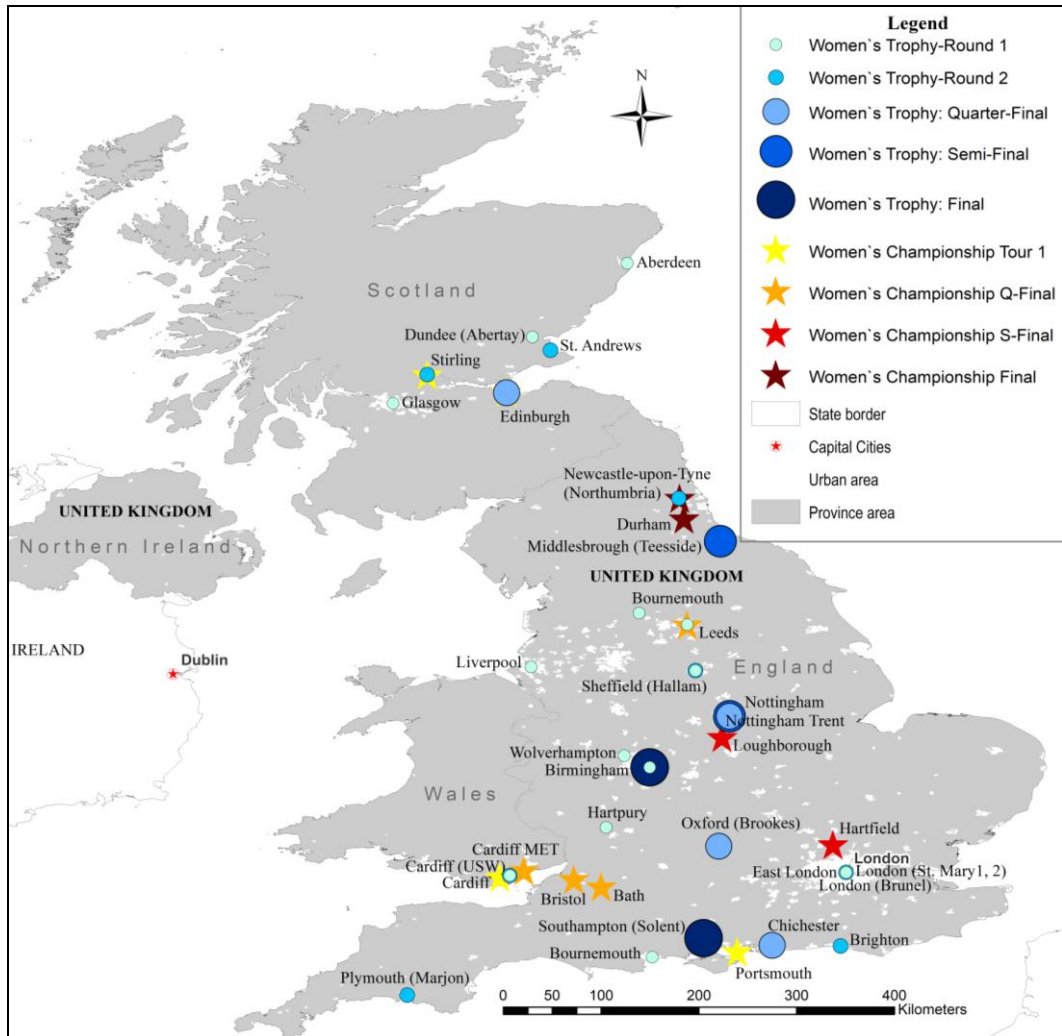


Figure 7. United Kingdom: Women's Championship and Men's Trophy Cups, 2019/2020 season⁴

The Conference Cup is organized for men's and women's teams and it is the third knockout competition. In the Conference Cup, 24 teams are registered from Scottish Leagues 2, 3 and 4 (tier 1-3) and this competition takes place from November till March.

In the *men's competition*, shown in figure 8, 13 universities, each with 1-3 teams (table 2) played which represented 8 university centers (Inverness is missing). With 3 teams each, Aberdeen (2-4), Strathclyde (1-3) and St. Andrews (1-3) had the most teams. St. Andrews mens1 and mens2 played a Semi-Final and the first team of this university also won the trophy, winning (2-0) in the final against the first team of Strathclyde1 University. According to the team's position in the institution's hierarchy (1-6), out of the 24 participating teams (figure 8), 7 institutions were represented by the first team (Men's1); by Men's2: 8 teams; Men's3: 7 teams and Men's4: 2 teams, namely, Aberdeen and Stirling. Table 3 and cartographic representation (figure 8)

show a qualitative spatial analysis (ranking the league and level in the Cups) and a quantitative one (number of teams, institutions etc.) on the level of 3rd, 4th and 5th leagues from the Scottish football.

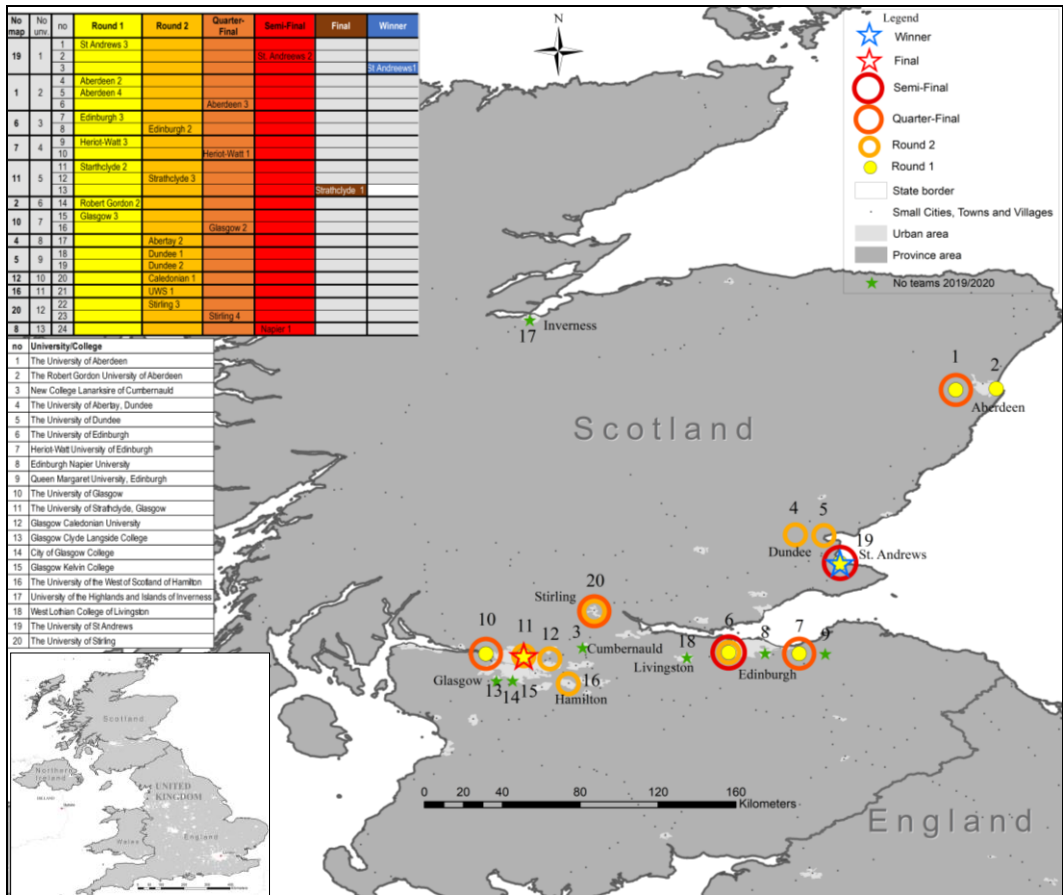


Figure 8. Men's Scottish Conference Cup (2-4 leagues), 2019/2020 season⁴

The Conference Cup for *women football* on Scottish territory included 11 teams from leagues 2 and 3 (levels 3 and 4), belonging to 10 universities (figure 9) which represented 6 university centers. St Andrews University participated with two teams and the 6 other institutions participated with one team: their first team. The Conference Cup is a knockout competition which takes place in parallel with the regular championship, starting in November and with the final in March. The winner of the Cup was the first team of Robert Gordon University from Aberdeen, which defeated the first team of the University of Dundee in the final (3-2).

The Conference Plate is the knockout competition which includes only the men's teams from the Scottish leagues 5 and 6. The cartographic representation of this competition is similar to figure 2 and is based on the representation of qualitative elements (performances) and quantitative elements (number of teams).

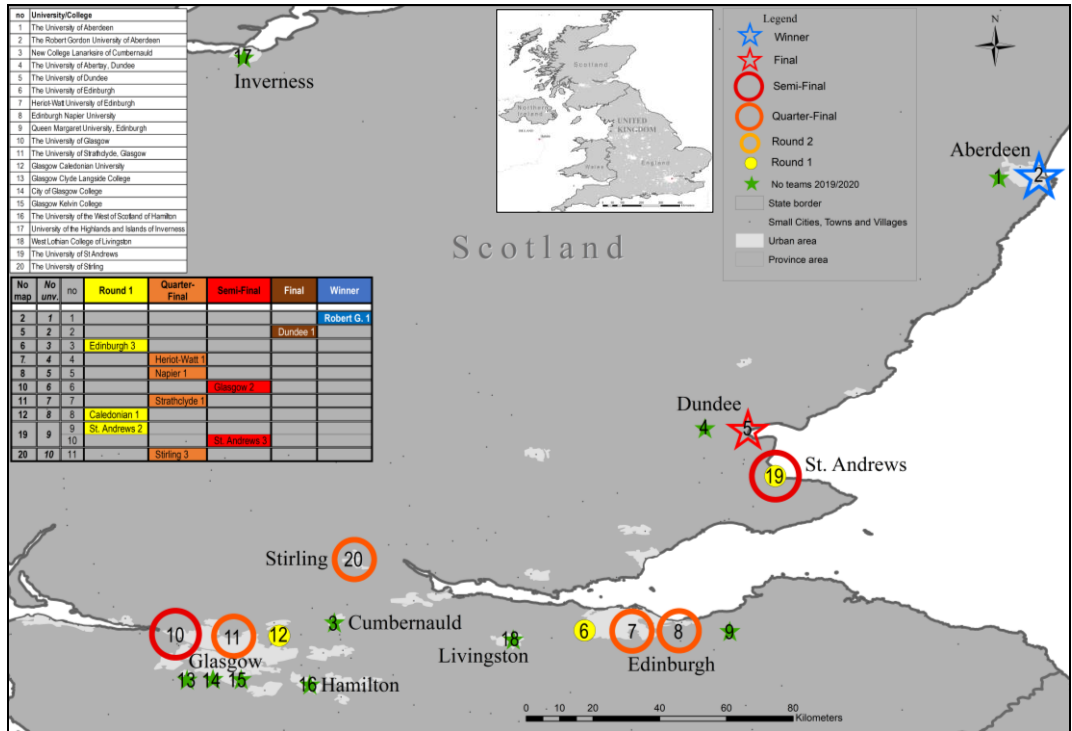


Figure 9. Women's Scottish Conference Cup (2-4 leagues), 2019/2020 season⁴

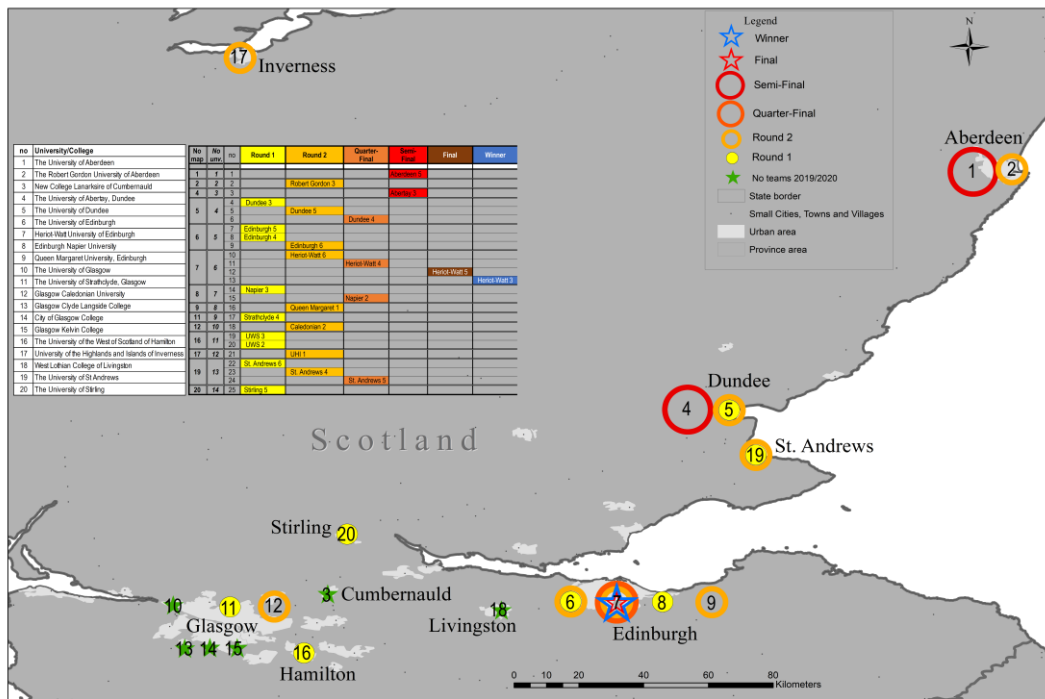


Figure 10. Men's Scottish Conference Plate (5-6 leagues), 2019/2020 season⁴

In the 2019/2020 season, all 8 university centers with 14 universities were represented by 25 teams (figure 4 and table 10). Dundee, Edinburgh and St. Andrews universities all had 3 teams each represented whilst Edinburgh Heriot-Watt University had the most teams represented (4). Two of these teams played in the final and the winner was the Men's 3 team (figure 10).

Other competitions. Some universities have a complex competitive programme with participation in different amateur leagues or cups, such as the Queen's Park Shield³². For example, Strathclyde University Football Club³³, participates in different Saturday competitions including: Glasgow and District Saturday morning league³⁴, Scottish Amateur Cup³⁵ and West Scotland Amateur Cup³⁶.

Conclusion

In conclusion, this research is a contribution to the geography of sport (Bale, 2003). It demonstrates the value of applying the methods of spatial analysis and, in particular, the richness of cartographic representation both for quantitative and qualitative aspects of the organization of sport. The case study was of the Scottish football university space which, includes both men's and women's teams and a total of 11 regular competitions structured on 7 levels for men and 4 for women with 7 knockout competitions. It is revealed in this study that across the 18 Scottish universities, football is very popular among students, with 15 of the universities supporting 82 football teams. The study has mapped out three structural aspects of the organization of the Scottish university football environment, namely the human resource (represented by players and teams), specific infrastructure, and competitions. The approach used in this article of specific cartographic representation methods, through qualitative and quantitative spatial analysis tools, and a systemic approach, generates potential useful information for territorial planning and organization policies and strategies in relation to sport. This organizational model could be applied beyond this analysis of Scotland.

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- ¹ <https://www.bucs.org.uk/>
- ² <https://football.wp.st-andrews.ac.uk/2019/11/22/19/>
- ³ www.google.com/maps
- ⁴ <https://bucs.playwaze.com/bucs-football/>
- ⁵ <http://www.scottishstudentsport.com/sports/football>
- ⁶ <https://spfl.co.uk/>
- ⁷ <http://slfl.co.uk/>
- ⁸ <https://www.stir.ac.uk/student-life/sport-at-stirling/performance-sport/football-men/>
- ⁹ <https://glasgowunifc.wordpress.com/contact-us/>
- ¹⁰ <http://www.caledonianleague.co.uk/l/team/692452232/377818440.html>
- ¹¹ <https://www.hesa.ac.uk/data-and-analysis>
- ¹² <https://sportsunion.dundee.ac.uk/clubs/football-men/>
- ¹³ <https://euafc.com/>
- ¹⁴ <https://www.hw.ac.uk/uk/edinburgh/sports/union/clubs/football.htm>
- ¹⁵ <https://www.facebook.com/AberdeenUniversityFC/>
- ¹⁶ <https://strathfootball.weebly.com/>
- ¹⁷ <https://www.abertay.ac.uk/life/abertay-sport/university-sports-union/football/>
- ¹⁸ <https://www.gla.ac.uk/myglasgow/sport/whatson/club/footballmen/>
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- ²¹ <https://www.uws.ac.uk/university-life/sports-social/>
- ²² <https://www.facebook.com/GCUFootball/>
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