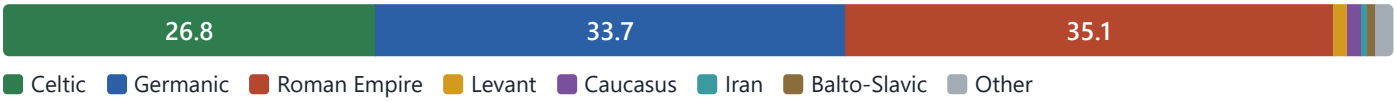
EXPLOREYOURDNA | CALCULATOR RESULTS

The Migration Era Calculator

by Karl O. Hogstrom, applied to the average G25 coordinates of 49 French départements

Each French département average (from ExploreYourDNA's French reference samples, 115 individuals in total) was modelled with Karl O. Hogstrom's Migration Era Calculator, whose sources are populations of Late Antiquity, from the Roman Empire and the Celtic world to the Germanic peoples, the steppe and Asia (0 to 550 CE). The calculator then gives the mix of those sources that best rebuilds each département.

France as a whole (average of the 49 départements)



35.1%	33.7%	26.8%	4.4%
Roman Empire	Germanic	Celtic	All other sources

Three sources do almost all the work: the population of the **Roman Empire**, the **Germanic** peoples and the **Celts** together explain about 95.6% of the average French département. The average fit distance is **0.0082**, which is a good fit: the model rebuilds the French profiles well with these Late Antique sources.

> **How to read these results.** The sources are reference groups of ancient individuals, not literal ancestors. "Celtic" stands for the Iron Age and Roman-era populations of Gaul and Britain, "Roman Empire" for the Mediterranean population of the Empire, and "Germanic" for the Germanic peoples of the first centuries AD (Franks, Goths, Anglo-Saxons and others). As the calculator stops at 550 CE, later arrivals that look northern, such as the Vikings in Normandy, can only show up as "Germanic". Lower fit distance means a better fit (under 0.005 very good, 0.005 to 0.01 good, over 0.01 fair).

At a glance

- **Most Celtic:** Finistère 63.6%, Côtes-d'Armor 60.8%, Loire-Atlantique 54.8%, Sarthe 47.6%, Morbihan 47.2%.
- **Most Germanic:** Ardennes 71.2%, Calvados 62.8%, Bas-Rhin 57.4%, Ille-et-Vilaine 51.4%, Nièvre 51%.
- **Most Roman Empire:** Corse-du-Sud 81.2%, Haute-Garonne 55.4%, Gard 52.2%, Yonne 51%, Rhône 47%.

Calculator: The Migration Era Calculator by Karl O. Hogstrom, exploreyourdna.com/calculator/186/the-migration-era-calculator-by-karl-o-hogstrom. Targets: département averages of ExploreYourDNA's French reference samples (Global25). Report generated by ExploreYourDNA, www.exploreyourdna.com

Region by region

Département results grouped into today's French regions. Each region is the average of its individuals (a département with 5 individuals counts five times more than one with a single individual). Île-de-France has no reference sample yet.

Celtic Germanic Roman Empire Levant Caucasus Iran Balto-Slavic Other

Region	Calculator result	n	Fit
Brittany	55.9 / 31.1 / 11.2	19	0.0041
Normandy	28.2 / 46.3 / 23.8	25	0.0023
Hauts-de-France	28 / 39.6 / 30.6	15	0.0014
Grand Est	14.8 / 51.1 / 28.9	8	0.0079
Pays de la Loire	42.9 / 30.2 / 24	9	0.0035
Centre-Val de Loire	7 / 49.8 / 28 / 10.6	2	0.0173
Bourgogne-Franche-Comté	17.2 / 37.4 / 40.6	7	0.0074
Nouvelle-Aquitaine	33.1 / 26.3 / 38.1	11	0.0101
Auvergne-Rhône-Alpes	22.2 / 32.6 / 41.1	9	0.0069
Occitanie	22.2 / 28.6 / 44.6	9	0.0115
Provence-Alpes-Côte d'Azur	18.4 / 27.2 / 45.2	1	0.0073
Corsica	81.2 / 10.6	1	0.0159

The big picture. Going from the north-east to the south, the Germanic share falls from about 51% in Grand Est and 46% in Normandy to about 29% in Occitanie and 0% in Corsica, while the Roman Empire share rises from 11% in Brittany to about 45% in Occitanie and Provence and 81% in Corsica. The Celtic share peaks in the west: Brittany (56%) and Pays de la Loire (43%). The calculator reproduces the classic north-south divide of France, and adds a clear Atlantic Celtic pole.

Brittany



Celtic **55.9%** · Germanic **31.1%** · Roman Empire **11.2%**

19 individuals, 4 départements (Côtes-d'Armor, Finistère, Ille-et-Vilaine, Morbihan) · fit 0.0041

The most Celtic region of France and the least Roman, with a very good fit. The split inside the region is striking: Finistère (63.6%), Côtes-d'Armor (60.8%) and Morbihan (47.2%), in Breton-speaking Lower Brittany, are strongly Celtic, while Ille-et-Vilaine, in Gallo-speaking Upper Brittany, is mostly Germanic (51.4%) and looks like its neighbours in Normandy and Maine. This fits the arrival of Britons from Britain in the 5th and 6th centuries, which reinforced the Celtic profile of western Armorica.

Normandy



Celtic **28.2%** · Germanic **46.3%** · Roman Empire **23.8%**

25 individuals, 5 départements (Calvados, Eure, Manche, Orne, Seine-Maritime) · fit 0.0023

The best-fitting region and one of the most Germanic. Calvados stands out at 62.8% Germanic. Two historical layers can contribute: the Saxons settled around Bayeux, whom Gregory of Tours calls the Saxones Baiocassini in the 6th century, and the Viking settlement of the 10th century, which this calculator (sources up to 550 CE) can only express as Germanic. Seine-Maritime keeps a stronger Celtic share (37.4%).

Hauts-de-France



Celtic **28%** · Germanic **39.6%** · Roman Empire **30.6%**

15 individuals, 3 départements (Nord, Pas-de-Calais, Somme) · fit 0.0014

An excellent fit, with Germanic ahead of Roman and Celtic. This is the old Frankish heartland around Tournai, where the Merovingian kingdom began. Pas-de-Calais (9 individuals) follows that pattern with 41.2% Germanic, while Nord (5 individuals) is more Celtic (42.4%) than its neighbours; with a handful of samples, this difference needs more data to be confirmed.

Grand Est



Celtic **14.8%** · Germanic **51.1%** · Roman Empire **28.9%**

8 individuals, 5 départements (Ardennes, Marne, Moselle, Bas-Rhin, Vosges) · fit 0.0079

The most Germanic region, and the second least Celtic. Bas-Rhin (57.4%, 4 individuals) and Moselle (47.2%) match the Alemannic and Frankish settlement of Alsace and Lorraine, where Germanic dialects are still spoken. Ardennes is the most Germanic département of the whole set (71.2%), but rests on one individual. Vosges, in Romance-speaking Lorraine, is the exception, with more Roman (40.2%) and Celtic (35.6%) than Germanic.

Pays de la Loire



Celtic **42.9%** · Germanic **30.2%** · Roman Empire **24%**

9 individuals, 4 départements (Loire-Atlantique, Maine-et-Loire, Sarthe, Vendée) · fit 0.0035

The second most Celtic region. The Celtic signal comes mainly from Loire-Atlantique (54.8%), which belonged to historical Brittany around Nantes and looks Breton here too, and from Sarthe (47.6%, one individual). Maine-et-Loire, the old Anjou, leans Germanic (46.2%), and Vendée is balanced between Celtic (42.8%) and Roman (46.0%).

Centre-Val de Loire



Celtic **7%** · Germanic **49.8%** · Roman Empire **28%**

2 individuals, 1 département (Indre) · fit 0.0173

Only Indre is available (2 individuals), so this is not a regional picture. Its result includes 10.6% Caucasus and 4.2% Levant and has the weakest fit of the whole set, so it should be read with caution.

Bourgogne-Franche-Comté



Celtic **17.2%** · Germanic **37.4%** · Roman Empire **40.6%**

7 individuals, 6 départements (Doubs, Jura, Nièvre, Haute-Saône, Saône-et-Loire, Yonne) · fit 0.0074

Roman and Germanic almost equal, with less Celtic. The Germanic share is high in Doubs (50.8%) and Nièvre (51.0%), in the area of the 5th-century Burgundian kingdom that gave the region its name. Yonne is the outlier, with only 9.0% Germanic and 51.0% Roman, but like most départements here it rests on a single individual.

Nouvelle-Aquitaine



Celtic **33.1%** · Germanic **26.3%** · Roman Empire **38.1%**

11 individuals, 7 départements (Charente-Maritime, Corrèze, Creuse, Dordogne, Gironde, Deux-Sèvres, Haute-Vienne) · fit 0.0101

The most balanced region. The Atlantic side keeps a strong Celtic share (Charente-Maritime 45.6%, Dordogne 46.8%), while Limousin (Corrèze, Creuse, Haute-Vienne) leans Roman, around 40%. Gironde, around Bordeaux, is the most Germanic (39.6%); the Visigoths ruled Aquitaine from 418 to 507, but one individual is not enough to tie this to them. The average fit is only fair.

Auvergne-Rhône-Alpes



Celtic **22.2%** · Germanic **32.6%** · Roman Empire **41.1%**

9 individuals, 5 départements (Ardèche, Loire, Haute-Loire, Rhône, Savoie) · fit 0.0069

Roman ahead, then Germanic and Celtic, plus a small Levant share (2.8%). Rhône is the most Roman département of the region (47.0%), which fits Lyon's role as Lugdunum, capital of the Roman Gauls. Savoie (34.2% Germanic) lies in the old Sapaudia, where the Burgundians were settled in 443.

Occitanie



Celtic **22.2%** · Germanic **28.6%** · Roman Empire **44.6%**

9 individuals, 7 départements (Aveyron, Gard, Haute-Garonne, Hérault, Lozère, Pyrénées-Orientales, Tarn) · fit 0.0115

The most Roman region of mainland France, with a small Levant share (2.4%). Haute-Garonne, around Toulouse, is 55.4% Roman; Toulouse was the Visigothic capital, but its Germanic share stays modest (23.4%). Pyrénées-Orientales has almost no Germanic (1.4%) and a high Celtic share (46.4%): the calculator has no Iberian source, so here "Celtic" most likely stands for western European Iron Age ancestry in general, close to that of Catalonia. The fit is only fair.

Provence-Alpes-Côte d'Azur



Celtic **18.4%** · Germanic **27.2%** · Roman Empire **45.2%**

1 individual, 1 département (Bouches-du-Rhône) · fit 0.0073

One individual from Bouches-du-Rhône, with small Caucasus (4.6%) and Balto-Slavic (3.8%) shares. A Mediterranean profile, as expected for Provence, the first Roman province of Gaul, but more samples are needed for a regional picture.

Corsica



Celtic **5.2%** · Germanic **0%** · Roman Empire **81.2%**

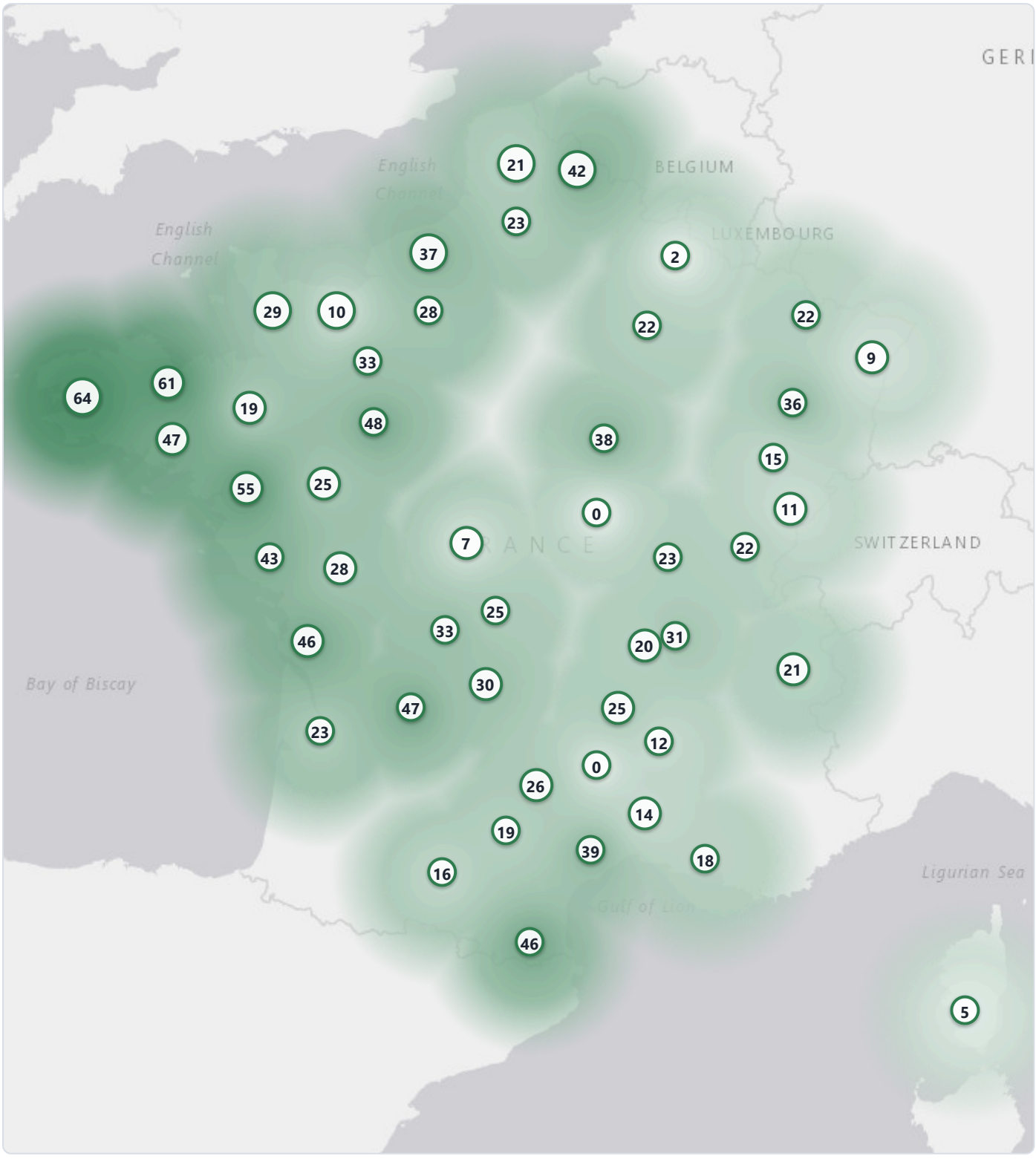
1 individual, 1 département (Corse-du-Sud) · fit 0.0159

The most Mediterranean profile of the set, with 10.6% Iran and no Germanic at all. This fits Corsica's long ties with Italy and the Tyrrhenian world, away from the Germanic migrations of the mainland. The fit is only fair and rests on one individual.

Regional averages weight each département by its number of individuals (Vendée, whose count is not given, counts as one). Regions with one or two individuals describe those people more than the region.

Celtic heatmap

The Celtic source is strongest in the west, with Brittany far ahead: Finistère 63.6%, Côtes-d'Armor 60.8%, Loire-Atlantique 54.8%, Sarthe 47.6%.

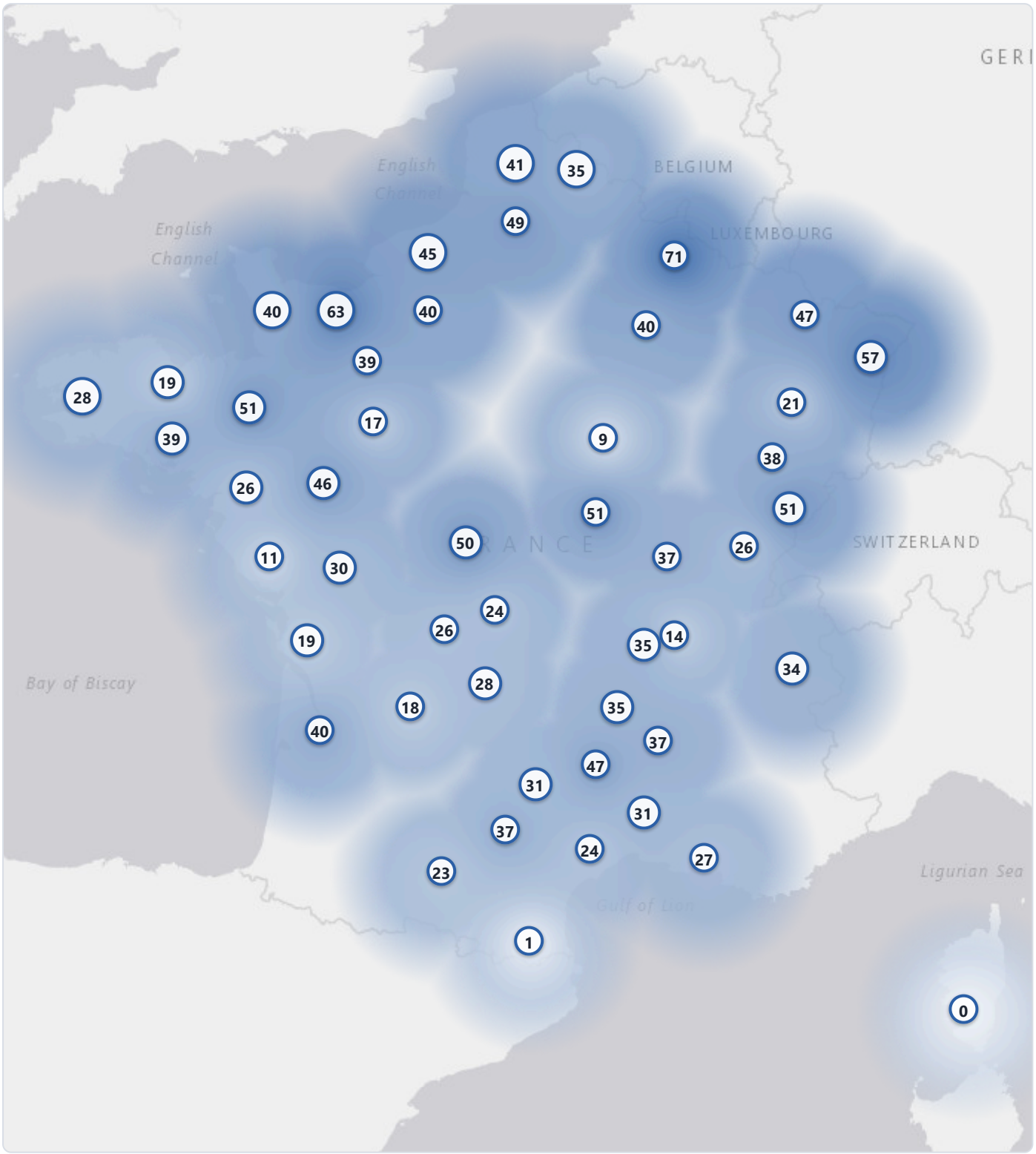


0% 63.6%

Heatmap of the Celtic share, interpolated between the département averages (inverse distance weighting, larger samples weigh more). Circles show each département average and its value, placed at the approximate centre of the département. Areas far from any sample are left blank: they have no data.

Germanic heatmap

The Germanic source is strongest in parts of the north and north-east, and in eastern Brittany: Ardennes 71.2%, Calvados 62.8%, Bas-Rhin 57.4%, Ille-et-Vilaine 51.4%.

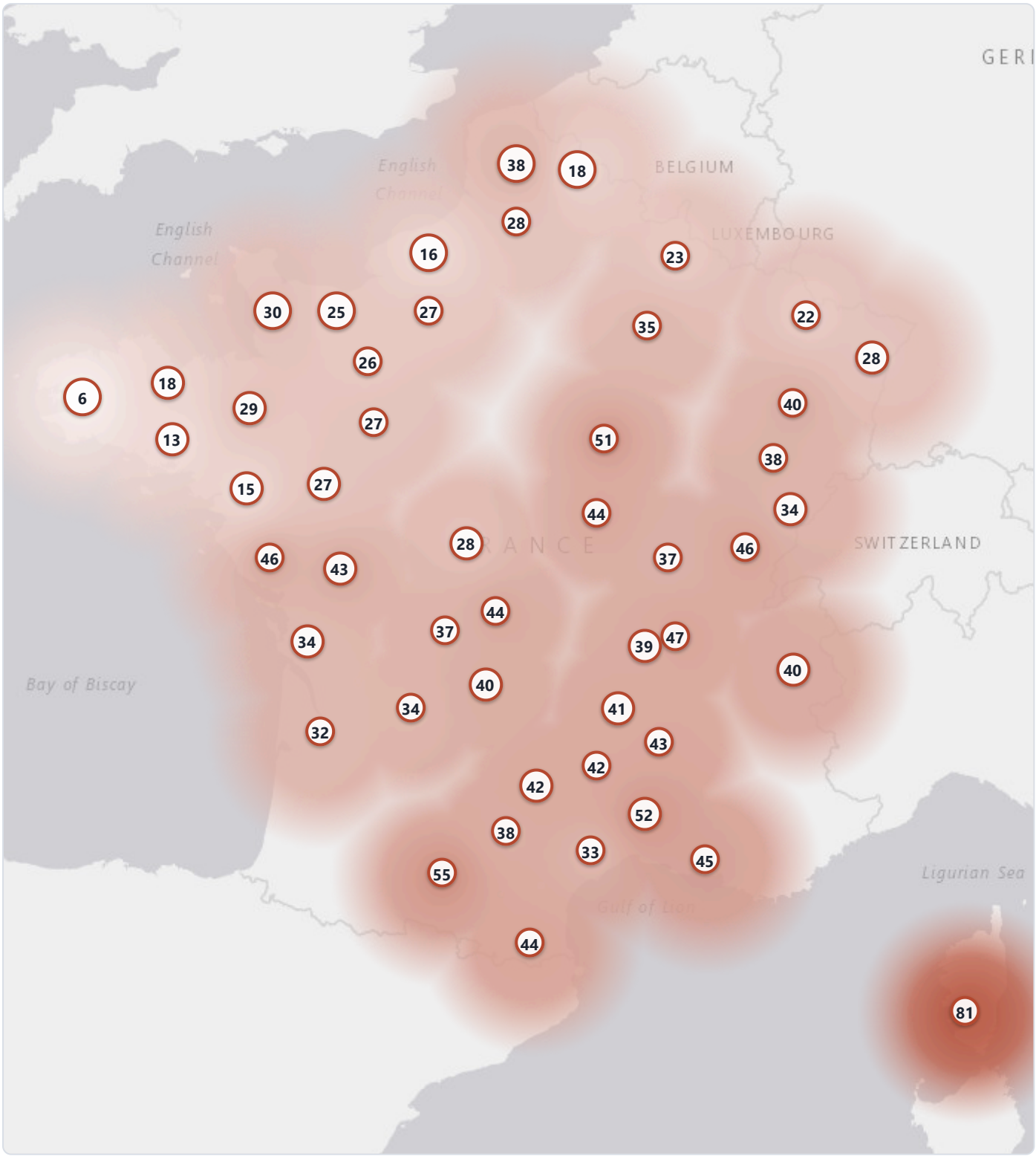


0% 71.2%

Heatmap of the Germanic share, interpolated between the département averages (inverse distance weighting, larger samples weigh more). Circles show each département average and its value, placed at the approximate centre of the département. Areas far from any sample are left blank: they have no data.

Roman Empire heatmap

The Roman Empire source is strongest in Corsica and the south, and also high in parts of the centre-east: Corse-du-Sud 81.2%, Haute-Garonne 55.4%, Gard 52.2%, Yonne 51%.



0% 81.2%

Heatmap of the Roman Empire share, interpolated between the département averages (inverse distance weighting, larger samples weigh more). Circles show each département average and its value, placed at the approximate centre of the département. Areas far from any sample are left blank: they have no data.

All départements, from most to least Celtic

Celtic Germanic Roman Empire Levant Caucasus Iran Balto-Slavic Other

Département	Calculator result	n	Fit
Finistère 29	63.6 28.4	11	0.0041
Côtes-d'Armor 22	60.8 19.4 18	3	0.0050
Loire-Atlantique 44	54.8 26.2 15.4	4	0.0046
Sarthe 72	47.6 17 27.2 8.2	1	0.0053
Morbihan 56	47.2 39.2 12.6	3	0.0018
Dordogne 24	46.8 18 33.8	1	0.0125
Pyrénées-Orientales 66	46.4 44.2 8	1	0.0153
Charente-Maritime 17	45.6 19.2 33.8	2	0.0083
Vendée 85	42.8 11.2 46	?	0.0014
Nord 59	42.4 34.8 18.4	5	0.0010
Hérault 34	39 23.6 32.6	1	0.0118
Yonne 89	38.4 9 51	1	0.0126
Seine-Maritime 76	37.4 44.6 16	9	0.0011
Vosges 88	35.6 21.2 40.2	1	0.0081
Orne 61	33.2 39.2 25.8	1	0.0088
Haute-Vienne 87	33.2 25.8 36.6	1	0.0118
Rhône 69	31.4 14 47	1	0.0080
Corrèze 19	29.8 28 39.6	3	0.0064
Manche 50	28.6 40.4 30.4	9	0.0004
Eure 27	27.8 40.4 27.4	1	0.0118
Deux-Sèvres 79	27.6 29.6 42.8	2	0.0133
Aveyron 12	25.6 31 42.2	2	0.0083
Maine-et-Loire 49	25.4 46.2 27	3	0.0021
Creuse 23	25 24.4 44.2	1	0.0136
Haute-Loire 43	24.6 34.6 40.8	3	0.0074

All départements (continued)

Celtic Germanic Roman Empire Levant Caucasus Iran Balto-Slavic Other

Département	Calculator result	n	Fit
Gironde 33	23.4 39.6 32.2	1	0.0114
Saône-et-Loire 71	23.4 36.6 36.6	1	0.0047
Somme 80	23.2 48.8 28	1	0.0085
Moselle 57	22.2 47.2 22 7.4	1	0.0153
Jura 39	22 26 46.4	1	0.0054
Marne 51	21.6 39.6 35.4	1	0.0102
Savoie 73	21 34.2 40	2	0.0053
Pas-de-Calais 62	20.6 41.2 37.6	9	0.0008
Loire 42	20.2 35.2 38.8	2	0.0049
Tarn 81	19.4 37.2 38.4	1	0.0116
Ille-et-Vilaine 35	19.2 51.4 29.4	2	0.0059
Bouches-du-Rhône 13	18.4 27.2 45.2	1	0.0073
Haute-Garonne 31	15.6 23.4 55.4	1	0.0102
Haute-Saône 70	15 37.6 37.6 9.8	1	0.0103
Gard 30	14 31.2 52.2	2	0.0136
Ardèche 07	11.8 37.2 42.8	1	0.0116
Doubs 25	10.8 50.8 34.2	2	0.0023
Calvados 14	9.8 62.8 24.8	5	0.0045
Bas-Rhin 67	9.4 57.4 27.6	4	0.0043
Indre 36	7 49.8 28 10.6	2	0.0173
Corse-du-Sud 2A	81.2 10.6	1	0.0159
Ardennes 08	71.2 23.4	1	0.0124
Lozère 48	47 42 9.6	1	0.0104
Nièvre 58	51 44	1	0.0146

n = number of individuals in the département average ("?" when the sample count was not given). Fit = calculator distance, lower is better.

Full results table (%)

Dep.	Département	n	Celtic	Germanic	Roman Empire	Levant	Caucasus	Iran	Balto-Slavic	Other	Fit
07	Ardèche	1	11.8	37.2	42.8	3.6	0	0	2.6	2	0.0116
08	Ardennes	1	1.6	**71.2**	23.4	0	3.8	0	0	0	0.0124
12	Aveyron	2	25.6	31	42.2	0	0	0	0.2	1	0.0083
13	Bouches-du-Rhône	1	18.4	27.2	45.2	0	4.6	0	3.8	0.8	0.0073
14	Calvados	5	9.8	62.8	24.8	0	0	0	0	2.6	0.0045
17	Charente-Maritime	2	45.6	19.2	33.8	1.2	0	0	0	0.2	0.0083
19	Corrèze	3	29.8	28	39.6	1.6	0	0	0	1	0.0064
22	Côtes-d'Armor	3	60.8	19.4	18	0	0	0	0	1.8	0.0050
23	Creuse	1	25	24.4	44.2	0	0	0	**6.2**	0.2	0.0136
24	Dordogne	1	46.8	18	33.8	0	1.2	0	0	0.2	0.0125
25	Doubs	2	10.8	50.8	34.2	0	4.2	0	0	0	0.0023
27	Eure	1	27.8	40.4	27.4	0	0	0	1	3.4	0.0118
29	Finistère	11	**63.6**	28.4	5.6	0	2.4	0	0	0	0.0041
2A	Corse-du-Sud	1	5.2	0	**81.2**	0	0	**10.6**	2.6	0.4	0.0159
30	Gard	2	14	31.2	52.2	0	0	0	0	2.6	0.0136
31	Haute-Garonne	1	15.6	23.4	55.4	0	0	0	5.2	0.4	0.0102
33	Gironde	1	23.4	39.6	32.2	0	1.4	0	0	3.4	0.0114
34	Hérault	1	39	23.6	32.6	0	0	0	0	4.8	0.0118
35	Ille-et-Vilaine	2	19.2	51.4	29.4	0	0	0	0	0	0.0059
36	Indre	2	7	49.8	28	4.2	**10.6**	0	0	0.4	0.0173
39	Jura	1	22	26	46.4	0	0	0	3.2	2.4	0.0054
42	Loire	2	20.2	35.2	38.8	5.2	0	0	0	0.6	0.0049
43	Haute-Loire	3	24.6	34.6	40.8	0	0	0	0	0	0.0074
44	Loire-Atlantique	4	54.8	26.2	15.4	0	0.4	0	0	3.2	0.0046
48	Lozère	1	0	47	42	**9.6**	1.4	0	0	0	0.0104
49	Maine-et-Loire	3	25.4	46.2	27	0	0.2	0	0	1.2	0.0021
50	Manche	9	28.6	40.4	30.4	0.4	0.2	0	0	0	0.0004
51	Marne	1	21.6	39.6	35.4	0	0	0.6	0	2.8	0.0102
56	Morbihan	3	47.2	39.2	12.6	0	1	0	0	0	0.0018
57	Moselle	1	22.2	47.2	22	0	0	7.4	0	1.2	0.0153
58	Nièvre	1	0	51	44	0	0	0	0.4	4.6	0.0146
59	Nord	5	42.4	34.8	18.4	0	2.4	0	0	2	0.0010
61	Orne	1	33.2	39.2	25.8	0	0	0	0	1.8	0.0088
62	Pas-de-Calais	9	20.6	41.2	37.6	0	0	0	0	0.6	0.0008
66	Pyrénées-Orientales	1	46.4	1.4	44.2	8	0	0	0	0	0.0153
67	Bas-Rhin	4	9.4	57.4	27.6	1.6	3.6	0	0.4	0	0.0043
69	Rhône	1	31.4	14	47	3.4	0	0	3.4	0.8	0.0080
70	Haute-Saône	1	15	37.6	37.6	0	9.8	0	0	0	0.0103
71	Saône-et-Loire	1	23.4	36.6	36.6	1.8	0	0	0	1.6	0.0047
72	Sarthe	1	47.6	17	27.2	0	0	0	0	**8.2**	0.0053
73	Savoie	2	21	34.2	40	3.8	0	0	0	1	0.0053
76	Seine-Maritime	9	37.4	44.6	16	2	0	0	0	0	0.0011
79	Deux-Sèvres	2	27.6	29.6	42.8	0	0	0	0	0	0.0133
80	Somme	1	23.2	48.8	28	0	0	0	0	0	0.0085

Dep.	Département	n	Celtic	Germanic	Roman Empire	Levant	Caucasus	Iran	Balto-Slavic	Other	Fit
81	Tarn	1	19.4	37.2	38.4	3.8	0	0	0	1.2	0.0116
85	Vendée	?	42.8	11.2	46	0	0	0	0	0	0.0014
87	Haute-Vienne	1	33.2	25.8	36.6	0	3.6	0	0.8	0	0.0118
88	Vosges	1	35.6	21.2	40.2	0	0	0	0	3	0.0081
89	Yonne	1	38.4	9	51	0	1.6	0	0	0	0.0126
	Average (49 départements)	**115**	**26.8**	**33.7**	**35.1**	**1**	**1.1**	**0.4**	**0.6**	**1.2**	**0.0082**

"Other" adds up the remaining sources (Alans, Bosporan Kingdom, Han Empire, Huns, Hun princess, North Africa, Sakas, Sarmatians, Sub-Saharan Africa, Swat Valley, Uralic, Wusun, Xianbei, Xiongnu), each very small. The highest value of each column is highlighted.

What stands out

- **A west to east and north to south gradient.** Celtic is highest in Brittany and the Atlantic west, Germanic in the north and north-east, and Roman Empire in the south, which matches the broad history of Gaul: Celtic Armorica, Frankish and later Norman settlement in the north, and a more Mediterranean population in the old Roman south.
- **Western Brittany stands apart.** Finistère, Côtes-d'Armor and Morbihan carry some of the largest Celtic shares, consistent with the old Armorican population and the arrival of Britons from Britain in the 5th and 6th centuries. Ille-et-Vilaine, in Gallo-speaking eastern Brittany, leans Germanic instead.
- **Normandy and the north lean Germanic.** Ardennes, Calvados, Seine-Maritime, Pas-de-Calais and Manche have a Germanic share of 40% or more, alongside Celtic and Roman. Part of the Normandy signal probably reflects the Vikings, which this calculator can only express as "Germanic".
- **Corsica is the most Roman.** Corse-du-Sud is modelled at 81.2% Roman Empire, the most Mediterranean profile of the set (its fit is only fair, with one sample).
- **Small eastern Mediterranean and Caucasus signals.** A few départements show a visible minor component: Indre: Caucasus 10.6%; Corse-du-Sud: Iran 10.6%; Haute-Saône: Caucasus 9.8%; Lozère: Levant 9.6%; Pyrénées-Orientales: Levant 8%; Moselle: Iran 7.4%; Creuse: Balto-Slavic 6.2%; Loire: Levant 5.2%; Haute-Garonne: Balto-Slavic 5.2%. These are single or small samples, so they are best read as individual variation rather than regional features.

Limits

- 26 of the 49 départements are represented by a single individual, so their results describe one person more than a whole département. The averages with 5 to 11 individuals (Finistère, Manche, Pas-de-Calais, Seine-Maritime, Calvados, Nord) are the most solid.
- Calculator sources are proxies: a share means "this source helps rebuild the profile", not "this many ancestors came from that people".
- Départements not listed have no reference sample yet.

Calculator: The Migration Era Calculator by Karl O. Hogstrom. Results computed on ExploreYourDNA (www.exploreyourdna.com). Base map: Esri, World Light Gray Canvas.