

US wind data

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2022-04-24

```
library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.1 --

## v ggplot2 3.3.5     v purrr   0.3.4
## v tibble  3.1.6     v dplyr    1.0.8
## v tidyr   1.2.0     v stringr  1.4.0
## v readr   2.1.2     vforcats 0.5.1

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()   masks stats::lag()

us_wind <- read.csv("https://raw.githubusercontent.com/rfordatascience/tidytuesday/master/data/2018/2018

us_wind %>%
  count(p_name, sort = TRUE)

##          p_name     n
## 1      unknown Tehachapi Wind Resource Area 1 1831
## 2                  Green Ridge Power  516
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## 711	Hoosac	19
## 712	McFadden Ridge	19
## 713	Vienna II	19
## 714	Big Blue Wind Farm	18
## 715	Cameron Ridge	18
## 716	Lookout	18
## 717	North Shaokatan Wind Farm	18
## 718	Power County	18
## 719	Rosiere Wind Farm	18
## 720	Shaokatan Hills	18
## 721	Top of Iowa III	18
## 722	Cirrus 1	17

## 723	Elk	17
## 724	Hancock	17
## 725	Klondike I	17
## 726	Stetson Wind expansion	17
## 727	unknown Stillwater County	17
## 728	Velva Wind Farm	17
## 729	Woodstock	17
## 730	Bison Wind 1A	16
## 731	Busch Ranch	16
## 732	Fourmile Ridge	16
## 733	Hawi Renewable	16
## 734	Montezuma	16
## 735	Nome	16
## 736	Sheffield	16
## 737	unknown Alameda County Bonus	16
## 738	unknown Caddo County	16
## 739	unknown Clay County	16
## 740	Buffalo Mountain	15
## 741	Camp Reed	15
## 742	Community Wind South	15
## 743	Deerfield Wind	15
## 744	Hawkeye	15
## 745	Intrepid Expansion	15
## 746	Lakota Ridge	15
## 747	Patton Wind Farm	15
## 748	Ponnequin (PSCo)	15
## 749	Red Horse 2	15
## 750	Solano Wind Project, Phase I	15
## 751	Benton County Wind Farm	14
## 752	Big Timber	14
## 753	Big Turtle II	14
## 754	Cassia	14
## 755	Forward	14
## 756	Happy Jack	14
## 757	Heritage Garden	14
## 758	Kaheawa Wind II	14
## 759	Lower Davenport	14
## 760	Nine Canyon III	14
## 761	North Dakota Wind II	14
## 762	Pakini Nui (KA'ALUALU)	14
## 763	Payne's Ferry	14
## 764	Ringer Hill	14
## 765	Salmon Falls	14
## 766	Sawtooth	14
## 767	Yahoo Creek	14
## 768	Burley Butte	13
## 769	Cedar Hills	13
## 770	Garnet Wind Project	13
## 771	Green Power	13
## 772	Greenfield Wind Farm	13
## 773	Locust Ridge	13
## 774	Milner Dam	13
## 775	Nine Canyon I	13
## 776	Oak Creek Energy Systems	13

## 777	Passadumkeag	13
## 778	Pomeroy (expansion)	13
## 779	Punta Lima	13
## 780	Sterling Phase I	13
## 781	unknown Pecos County	13
## 782	unknown San Gorgonio Pass 7	13
## 783	Wildcat Wind Project	13
## 784	Adams Wind Generations, LLC	12
## 785	Bear Creek	12
## 786	Brahms Wind, LLC	12
## 787	Community Wind North	12
## 788	Danielson	12
## 789	Diamond Willow Wind	12
## 790	Eva Creek	12
## 791	Fair Wind	12
## 792	Kahuku	12
## 793	Karen Avenue Windfarm	12
## 794	Kimball Wind Farm	12
## 795	Lempster	12
## 796	Lincoln Wind Energy Facility	12
## 797	Mozart	12
## 798	Nine Canyon II	12
## 799	Saddleback Ridge	12
## 800	Tehachapi Windplant II	12
## 801	Bingham Lake	11
## 802	Casper Wind Farm	11
## 803	Fire Island Project	11
## 804	Martinsdale Wind Farm	11
## 805	Oak Tree	11
## 806	Pleasant Hill	11
## 807	Ridgewind	11
## 808	unknown Adams County	11
## 809	30 MW Iowa DG Portfolio	10
## 810	Berkshire Wind	10
## 811	Big Turtle	10
## 812	Cross Winds	10
## 813	Echo 8-9	10
## 814	Ewington	10
## 815	Farmers' coops/Westridge	10
## 816	Frisco	10
## 817	Grant County	10
## 818	Greensburg	10
## 819	Marsh Hill	10
## 820	Mountain View Power Partners I	10
## 821	Mountain View Power Partners II	10
## 822	Nordex Energy	10
## 823	Odin	10
## 824	Pine Tree extension	10
## 825	PYCO Soaring Wind Farm	10
## 826	Spruce Mountain	10
## 827	Stoney Corners II	10
## 828	Stoney Corners III	10
## 829	Taconite Ridge Energy Center	10
## 830	Titan I	10

## 831	unknown Bailey County	10
## 832	unknown Bethel Census Area	10
## 833	unknown Gratiot County	10
## 834	Wethersfield	10
## 835	Winnebago I	10
## 836	Bison Wind 1B	9
## 837	Buffalo Bear	9
## 838	Carroll Area	9
## 839	G. McNeilus Wind Farm	9
## 840	Marshall	9
## 841	McKinley Wind Park	9
## 842	Medicine Bow	9
## 843	Mill Run Windpower LLC	9
## 844	Oregon Trail	9
## 845	Searsburg	9
## 846	Spanish Fork	9
## 847	unknown Brule County	9
## 848	unknown Cheyenne County	9
## 849	unknown Ellis County	9
## 850	Westridge	9
## 851	Alite Wind Farm	8
## 852	Anderson Wind Project	8
## 853	Auwahi Wind	8
## 854	Brookfield Tehachapi 2	8
## 855	Canton Mountain	8
## 856	Coram Energy LLC	8
## 857	Desert Hot Springs	8
## 858	Diamond Willow extension	8
## 859	East Ridge	8
## 860	Edom Hills (repower)	8
## 861	Golden Valley	8
## 862	Green Mountain Wind Farm	8
## 863	JD Wind 10	8
## 864	JD Wind 11	8
## 865	JD Wind 7	8
## 866	JD Wind 8	8
## 867	JD Wind Phase V	8
## 868	JD Wind VI	8
## 869	Martinsdale Colony South	8
## 870	Shirley	8
## 871	Solano Phase IIIA	8
## 872	Solano Wind Project, Phase IA	8
## 873	Steel Winds	8
## 874	Thousand Springs	8
## 875	Tuana Springs	8
## 876	unknown Canadian County	8
## 877	unknown Clark County	8
## 878	unknown Lamb County	8
## 879	Viking	8
## 880	Wege Wind Farm	8
## 881	Bison 1B (2011)	7
## 882	East Winds	7
## 883	Fossil Gulch	7
## 884	Hardin-Hilltop	7

## 885	Iowa Lakes Lakota Wind	7
## 886	Iowa Lakes Superior Wind	7
## 887	Madison Windpower	7
## 888	MinWind III-IX	7
## 889	Musselshell I	7
## 890	Musselshell II	7
## 891	Pilgrim Stage Station	7
## 892	South Dakota Wind Partners	7
## 893	Stoney Corners - Repower	7
## 894	Tuana Gulch	7
## 895	Two Dot wind farm	7
## 896	unknown Nolan County	7
## 897	unknown Solano County	7
## 898	Chopin	6
## 899	Enron Earth Smart/Green Power	6
## 900	Fairfield Wind Farm	6
## 901	Farmer's	6
## 902	Galactic Wind	6
## 903	Gordon Butte	6
## 904	Harbor Wind	6
## 905	Horseshoe Bend/ranch pit	6
## 906	JD WInd 9	6
## 907	Kotzebue Wind Project Phase I	6
## 908	Lime Wind	6
## 909	Missouri River Energy Services (MRES)	6
## 910	Mustang Hills	6
## 911	NREL - NWTC	6
## 912	PaTu Wind Farm	6
## 913	Somerset	6
## 914	South Fork	6
## 915	Steel Winds II	6
## 916	Sunray I	6
## 917	Threemile Canyon	6
## 918	Two Dot	6
## 919	Unalakleet	6
## 920	unknown Alameda County	6
## 921	unknown San Gorgonio Pass 6	6
## 922	Benson Creek	5
## 923	Block Island	5
## 924	DeWind Little Pringle #1	5
## 925	DeWind Little Pringle #2	5
## 926	Durbin Creek	5
## 927	Jericho Mountain	5
## 928	Jersey Atlantic Wind Farm	5
## 929	Jett Creek	5
## 930	Junction Hilltop Wind	5
## 931	Kingman	5
## 932	Kotzebue Wind Project Phases II & III	5
## 933	Lalamilo Wells Repowering	5
## 934	Mason Wind LLC Mason City	5
## 935	Norgaard (7 Projects)	5
## 936	Pantex Renewable Energy Project	5
## 937	Pisgah Mountain	5
## 938	Prospector	5

## 939	Ralls Wind Farm	5
## 940	Swauk Valley	5
## 941	Tuntutuliak	5
## 942	unknown Aurora County	5
## 943	unknown Kenedy County	5
## 944	unknown Lubbock County	5
## 945	Valley View	5
## 946	West Pipestone (Maiden Winds)	5
## 947	Willow Spring	5
## 948	Wolf	5
## 949	Agriwind	4
## 950	Chevak	4
## 951	Cisco	4
## 952	Coastal Energy	4
## 953	Creston Ridge	4
## 954	Emmonak 1	4
## 955	Future Generation Wind	4
## 956	Georgia Mountain	4
## 957	Hopkins Ridge II	4
## 958	Huerfano River	4
## 959	Lamar Municipal	4
## 960	Loess Hills Wind Project	4
## 961	MinWind I & II	4
## 962	New York State Thruway Authority	4
## 963	ONU Wind	4
## 964	Selawik Wind Project	4
## 965	unknown McHenry County	4
## 966	WPS Wind Farm (Casco)	4
## 967	Agassiz Beach	3
## 968	Apogee Stadium Wind	3
## 969	Big Spring II	3
## 970	Buffalo Mountain (Windrock)	3
## 971	Case Western University	3
## 972	Champepaden, Chandler Hills Phase II	3
## 973	Chandler Hills Wind Farm	3
## 974	Creston Ridge Expansion	3
## 975	Delta Junction	3
## 976	Field's Point Wastewater Treatment Facilit	3
## 977	Foote Creek Rim II	3
## 978	Fox Islands	3
## 979	Ft Buchanan Energy Savings Performance Con	3
## 980	Gambell Wind	3
## 981	Green Mountain Power	3
## 982	Haviland Wind Project	3
## 983	Highland II	3
## 984	Hooper Bay	3
## 985	IDGWP	3
## 986	Kasigluk	3
## 987	Kodiak Island Wind Project	3
## 988	Kotzebue Wind Project	3
## 989	Kotzebue Wind Project2	3
## 990	Lakeshore Technical College	3
## 991	Lubbock Wind Ranch	3
## 992	Mason Wind LLC Dyersville	3

## 993	Mason Wind LLC Fairbank	3
## 994	Mason Wind LLC Perry	3
## 995	Mendota Hills	3
## 996	Minnesota Wind Share	3
## 997	Moulton, Chandler Hills Wind Farm Phase II	3
## 998	No Fossil Fuel - Kingston	3
## 999	Patriot	3
## 1000	Pillar Mountain II	3
## 1001	Prairie Winds Minot Wind 2	3
## 1002	Quinhagak	3
## 1003	San Clemente Island	3
## 1004	Seven Mile Hill I	3
## 1005	Talbot County DPW	3
## 1006	Tholen & Petersen	3
## 1007	Toksook Bay	3
## 1008	Uilk Wind Farm	3
## 1009	unknown Benton County	3
## 1010	unknown Fillmore County	3
## 1011	unknown Kent County	3
## 1012	unknown Kern County	3
## 1013	unknown Maui County	3
## 1014	unknown Northwest Arctic Borough	3
## 1015	unknown O'Brien County	3
## 1016	unknown Oldham County	3
## 1017	unknown Utah County	3
## 1018	unknown Walla Walla County	3
## 1019	WED Coventry 2	3
## 1020	WED Coventry 6	3
## 1021	Whirlpool Corporation - Marion Wind Farm	3
## 1022	Zephyr Wind Project	3
## 1023	6th Space Warning Squadron	2
## 1024	AFCEE MMR Turbines	2
## 1025	AMP-Ohio/Green Mountain Energy Wind Farm	2
## 1026	Anheuser-Busch Fairfield	2
## 1027	Bacardi Puerto Rico	2
## 1028	Barnstable Wastewater Treatment Facility	2
## 1029	Blue Breezes I & II	2
## 1030	Bowling Green Municipal	2
## 1031	BTI Wind	2
## 1032	Camp Williams	2
## 1033	Carleton College	2
## 1034	Cashton Greens	2
## 1035	Cemex Black Mountain Quarry	2
## 1036	Cemex River Plant	2
## 1037	Chamberlain Wind Project	2
## 1038	City of Howard Wind Turbines	2
## 1039	Cloud County Community College	2
## 1040	Cooper Farms	2
## 1041	Corn Plus	2
## 1042	Department of Correction, NCCI Gardner	2
## 1043	Equity Industrial Partners	2
## 1044	F.E. Warren Air Force Base	2
## 1045	Fairhaven Wind	2
## 1046	Fairmont Wind (SMMPA)	2

## 1047	Fort Hays State University	2
## 1048	Geneseo Wind Farm	2
## 1049	GL Wind	2
## 1050	GSA	2
## 1051	GWE, LLC	2
## 1052	Harbec Plastics	2
## 1053	Honda Plant	2
## 1054	Hueco Mountain Wind Ranch	2
## 1055	Kas Farms	2
## 1056	Lakota Wind	2
## 1057	Llano Estacado Wind Ranch at Texico II	2
## 1058	LLC 2	2
## 1059	Moorhead	2
## 1060	Mount Wachusett Wind Farm	2
## 1061	MWRA Deer Island	2
## 1062	Nestle Waters	2
## 1063	Nevada High School	2
## 1064	New England Tech	2
## 1065	Nome Newton Peak	2
## 1066	Norgaard	2
## 1067	Olsen Farms	2
## 1068	Pioneer Grove	2
## 1069	Prairie II	2
## 1070	PrairieWinds Minot Wind 1	2
## 1071	Princeton Municipal Light and Water Plant	2
## 1072	Redwood Falls (SMMPA)	2
## 1073	Robertsons Ready Mix	2
## 1074	Sacred Heart Monastery	2
## 1075	Safeway Tracy	2
## 1076	San Gorgonio Wind Associates 7	2
## 1077	Sand Point	2
## 1078	Savoonga	2
## 1079	SC Johnson Waxdale Plant	2
## 1080	Shaktoolik	2
## 1081	Shaokatan Power Partners	2
## 1082	Sibley Wind Farm	2
## 1083	Spirit Lake	2
## 1084	Springview II Wind Facility	2
## 1085	St. Paul Island II	2
## 1086	Stoney Corners	2
## 1087	Suzlon Project VII	2
## 1088	Turkey Hill Frey Farm	2
## 1089	University of MN -- Morris	2
## 1090	unknown Collins County	2
## 1091	unknown Dakota County	2
## 1092	unknown Darke County	2
## 1093	unknown Donley County	2
## 1094	unknown El Paso County	2
## 1095	unknown Erie County	2
## 1096	unknown Griggs County	2
## 1097	unknown Hancock County	2
## 1098	unknown Harris County	2
## 1099	unknown Isabella County	2
## 1100	unknown Kotzebue Wind Project	2

## 1101	unknown Kusilvak Census Area	2
## 1102	unknown Lake and Peninsula Borough	2
## 1103	unknown Lea County	2
## 1104	unknown Lorain County	2
## 1105	unknown Montgomery County	2
## 1106	unknown Morton County	2
## 1107	unknown Murray County	2
## 1108	unknown Oneida County	2
## 1109	unknown Polk County	2
## 1110	unknown Pratt County	2
## 1111	unknown Quay County	2
## 1112	unknown Randall County	2
## 1113	unknown Riverside County	2
## 1114	unknown Union County	2
## 1115	unknown Washoe County	2
## 1116	unknown Wayne County	2
## 1117	unknown Yuma County	2
## 1118	Upper Scioto Valley School	2
## 1119	Wagner	2
## 1120	Wales Wind Energy Project	2
## 1121	Whirlpool Corporation - Findlay Wind Farm	2
## 1122	Willmar	2
## 1123	Wind Colebrook South	2
## 1124	Winona	2
## 1125	Wynford Local Schools	2
## 1126	Zachary Ridge	2
## 1127	Zotos	2
## 1128	AG Land 1	1
## 1129	AG Land 2	1
## 1130	AG Land 3	1
## 1131	AG Land 4	1
## 1132	AG Land 5	1
## 1133	AG Land 6	1
## 1134	Air Force (Barnstable)	1
## 1135	Air Force (Laramie)	1
## 1136	Akron-Westfield School District	1
## 1137	American Windmill Museum	1
## 1138	Appalachian State	1
## 1139	Applied Materials	1
## 1140	Archbold Local Schools Wind Turbine	1
## 1141	Arends Brothers	1
## 1142	Arnold Wind Farm	1
## 1143	August Wind Energy LLC	1
## 1144	Aurora Wal-Mart	1
## 1145	Barstow Marine Logistics Base	1
## 1146	Bayonne Wind Energy Project	1
## 1147	Bellevue High School	1
## 1148	Berkshire East Ski Area	1
## 1149	Big Windy	1
## 1150	Birch Power LLC	1
## 1151	Bitworks	1
## 1152	BLM-JCI	1
## 1153	Bolton Valley Resort	1
## 1154	Boyce Dairy Farm	1

## 1155	Brookfield Tehachapi	3	1
## 1156	Brown County Wind Turbine		1
## 1157	Bulldog		1
## 1158	Burco Farm & Feed		1
## 1159	Bureau Valley School District		1
## 1160	Byers Auto		1
## 1161	Byron		1
## 1162	California State Prison Los Angeles County		1
## 1163	Camelot Wind Project		1
## 1164	Cannon 1		1
## 1165	Cannon II		1
## 1166	Cape Cod Regional Transit Authority		1
## 1167	Carthage Wind Turbine		1
## 1168	Cemex Madison		1
## 1169	Central Community College-Hastings		1
## 1170	Charlestown Wind Turbine		1
## 1171	City of Medford		1
## 1172	City of Seward		1
## 1173	City of Soledad Water Reclamation Facility		1
## 1174	Clark Thompson	1	1
## 1175	Clay High School		1
## 1176	Cloud Power		1
## 1177	Conneaut Middle School		1
## 1178	Conneaut Waste Water Treatment		1
## 1179	Cooper Farms Amendment		1
## 1180	Crisfield Waste Water Treatment Plant		1
## 1181	Cumberland Rose		1
## 1182	Cuyahoga County Fairgrounds		1
## 1183	DH Blattner Headquarters		1
## 1184	Dinosaur Point		1
## 1185	Doerfler Farms		1
## 1186	Don Sneve Wind Farms		1
## 1187	Dynapower		1
## 1188	Dynapower	1	1
## 1189	El Dorado Wind Power		1
## 1190	Eldora-New Providence Schools		1
## 1191	Elkhorn Valley (08)		1
## 1192	Eolos		1
## 1193	Erie Community School District	1	1
## 1194	Erie Industrial Park		1
## 1195	Eswood School		1
## 1196	Evansville WWTP		1
## 1197	Exelon Wind	11	1
## 1198	Falmouth II		1
## 1199	Falmouth Notus		1
## 1200	Falmouth Wastewater		1
## 1201	Federated Rural Electric		1
## 1202	Fenner Wind Power Project - Repower		1
## 1203	FHSU Wind		1
## 1204	Forbes Park		1
## 1205	Forest City High School		1
## 1206	Fort Huachuca		1
## 1207	Forward Fontanelle		1
## 1208	Gaines Cavern Wind Project		1

## 1209	GobNob	1
## 1210	Golden Acorn Casino	1
## 1211	Grafton Technical College	1
## 1212	Great Lakes Science Center	1
## 1213	Great River Energy Headquarters	1
## 1214	Green Energy Machine	1
## 1215	Greenfield Wind	1
## 1216	Guam Power Authority Wind Turbine	1
## 1217	Guthrie WWTP	1
## 1218	Half Hollow Nursery	1
## 1219	Harpster Wind	1
## 1220	Hasslebach Meats	1
## 1221	Heartland Community College	1
## 1222	Heritage Flight	1
## 1223	High Plains Tech Center	1
## 1224	Hilltop Power	1
## 1225	Hodges Badge	1
## 1226	Holy Name Catholic High School	1
## 1227	Hometown WindPower Anoka	1
## 1228	Hometown WindPower Arlington	1
## 1229	Hometown WindPower Brownton	1
## 1230	Hometown WindPower Buffalo	1
## 1231	Hometown WindPower Chaska	1
## 1232	Hometown WindPower East Grand Forks	1
## 1233	Hometown WindPower Faribault	1
## 1234	Hometown WindPower North St. Paul	1
## 1235	Hometown WindPower Olivia	1
## 1236	Hometown WindPower Shakopee	1
## 1237	Hometown WindPower Winthrop	1
## 1238	Hopkins Ridge I	1
## 1239	Hull I	1
## 1240	Hull Wind Phase II	1
## 1241	Huron Schools	1
## 1242	Hyannis Country Garden	1
## 1243	IBEW local 103	1
## 1244	Illinois Rural Electric Cooperative	1
## 1245	Indian Mesa / Aeolus	1
## 1246	Inland Empire Utility Agency	1
## 1247	Iowa Lakes Community College	1
## 1248	Iowa State Fair Wind Project	1
## 1249	Ipswich	1
## 1250	Ipswich II	1
## 1251	Jiminy Peak Ski Resort	1
## 1252	JJN Wind Farm	1
## 1253	Kalamazoo Valley Community College	1
## 1254	Kenston School District	1
## 1255	Kingston	1
## 1256	Kirkwood Community College	1
## 1257	Lac qui Parle Valley School	1
## 1258	Lake Palmdale	1
## 1259	Lake Region State College Wind Turbine	1
## 1260	Lakeview Ridge	1
## 1261	Lamar III	1
## 1262	Lenox Municipal Utilities	1

## 1263	Lincoln County	1
## 1264	Lincoln Electric	1
## 1265	Little Cedar	1
## 1266	Llano Estacado Wind Ranch at Texico	1
## 1267	LLC 1	1
## 1268	Luther College	1
## 1269	LWSC Wind Turbine	1
## 1270	Mackinaw City	1
## 1271	Mackinaw City (Bay Windpower I)	1
## 1272	Margaretta Elementary School	1
## 1273	Mark Richey Woodworking	1
## 1274	Massachusetts Maritime Academy	1
## 1275	Massachusetts National Cemetery	1
## 1276	McEvoy Ranch	1
## 1277	Meadow Ridge	1
## 1278	Mesalands	1
## 1279	Method Manufacturing Plant	1
## 1280	Metro Wind, LLC	1
## 1281	Mill Run Wind	1
## 1282	Minnkota Power Cooperative	1
## 1283	Mount St. Mary's Abbey	1
## 1284	Mountain Lake Wind	1
## 1285	Mountain Peak Special Utility District	1
## 1286	Mountain View Grand	1
## 1287	MUTI	1
## 1288	MUTI Wind Turbine	1
## 1289	Nantucket High School	1
## 1290	Nature's Classroom Wind Turbine	1
## 1291	Neppel Wind Power Project	1
## 1292	New London	1
## 1293	NEXGEN	1
## 1294	Nobles Cooperative Electric	1
## 1295	NORESCO	1
## 1296	North Kingstown Green	1
## 1297	North Newton School Corporation	1
## 1298	Northwestern School Corporation	1
## 1299	Oasis	1
## 1300	Omaha Public	1
## 1301	Osage Utilities	1
## 1302	Other World Computing	1
## 1303	Otis Wind Energy Project	1
## 1304	Pembina Border Station	1
## 1305	Pettisville Local Schools	1
## 1306	Philips Lightolier	1
## 1307	Phoenix Press	1
## 1308	Pick-a-Part Turbine	1
## 1309	Pigeon Creek	1
## 1310	Pine Ridge Job Corp	1
## 1311	Pipestone School District	1
## 1312	Ponnequin (EUI)	1
## 1313	Port of Milwaukee	1
## 1314	Porta High School	1
## 1315	Portsmouth Abbey School	1
## 1316	Presque Isle	1

## 1317	Pueblo Towers	1
## 1318	Randolph Eastern School Corporation	1
## 1319	Richland Community College	1
## 1320	Rock of Ages	1
## 1321	Roeder Farms	1
## 1322	Rosebud Sioux	1
## 1323	Roseman Energy LLC	1
## 1324	Sandywoods	1
## 1325	Santa Fe Public Works	1
## 1326	Scheid Vineyards	1
## 1327	Scituate Wind	1
## 1328	Seneca Nation	1
## 1329	Sentral Community School	1
## 1330	Shakopee Mdewakanton Sioux	1
## 1331	Shakopee Mdewakanton Sioux Community Wind	1
## 1332	Shenandoah School Corporation	1
## 1333	Sherrard High School	1
## 1334	Sibley Hills	1
## 1335	Sky Volt	1
## 1336	Spearville I	1
## 1337	St. Cloud VA Medical Center	1
## 1338	St. Olaf College	1
## 1339	St. Paul Island I	1
## 1340	Story City Wind	1
## 1341	Story County Medical Center	1
## 1342	Stuart	1
## 1343	Superior Farms	1
## 1344	Sustainable Technologies Museum (Turbine A	1
## 1345	Taylor Farms	1
## 1346	Teichert Aggregates	1
## 1347	Templeton Wind Turbine	1
## 1348	Testa Produce	1
## 1349	Texas Tech - Nolan	1
## 1350	The City of Union City	1
## 1351	Three D Metals Corporation	1
## 1352	Time Factory Wind	1
## 1353	Tin City Long Range Radar Station	1
## 1354	Tippecanoe Valley School Corporation	1
## 1355	TJ Automation	1
## 1356	Tjaden Farms	1
## 1357	Toksook Bay Expansion	1
## 1358	Tooele Army Depot II	1
## 1359	Town of Richland	1
## 1360	Traer Wind	1
## 1361	Traverse City	1
## 1362	Turbine EVE	1
## 1363	Turtle Mountain College	1
## 1364	UL Advanced Wind Turbine Test Facility	1
## 1365	University of Delaware	1
## 1366	University of Hawaii at Maui Wind Generato	1
## 1367	University of Massachussetts Dartmouth	1
## 1368	University of Toledo Wind Turbine	1
## 1369	unknown Addison County	1
## 1370	unknown Alameda County 250KW	1

## 1371	unknown Alameda County EnerTech	1
## 1372	unknown Allegany County	1
## 1373	unknown Atchison County	1
## 1374	unknown Black Hawk County	1
## 1375	unknown Brown County	1
## 1376	unknown Buena Vista County	1
## 1377	unknown Butler County	1
## 1378	unknown Cameron County	1
## 1379	unknown Cass County	1
## 1380	unknown Cayuga County	1
## 1381	unknown Cerro Gordo County	1
## 1382	unknown Champaign County	1
## 1383	unknown Chaves County	1
## 1384	unknown Cherokee County	1
## 1385	unknown Clinton County	1
## 1386	unknown Codington County	1
## 1387	unknown Collin County	1
## 1388	unknown Columbia County	1
## 1389	unknown Contra Costa County	1
## 1390	unknown Dickey County	1
## 1391	unknown Doniphan County	1
## 1392	unknown Flagler County	1
## 1393	unknown Ford County	1
## 1394	unknown Garden County	1
## 1395	unknown Greeley County	1
## 1396	unknown Greenbrier County	1
## 1397	unknown Grundy County	1
## 1398	unknown Guthrie County 2	1
## 1399	unknown Hansford County	1
## 1400	unknown Harvey County	1
## 1401	unknown Haskell County	1
## 1402	unknown Hawaii County	1
## 1403	unknown Hidalgo County	1
## 1404	unknown Hooker County	1
## 1405	unknown Jackson County 1	1
## 1406	unknown Jasper County	1
## 1407	unknown Johnson County 1	1
## 1408	unknown Johnson County 3	1
## 1409	unknown Kenai Peninsula Borough	1
## 1410	unknown Kingman County	1
## 1411	unknown Kings County	1
## 1412	unknown Kiowa County	1
## 1413	unknown Lancaster County	1
## 1414	unknown Lander County	1
## 1415	unknown Lea County 1	1
## 1416	unknown Lea County 2	1
## 1417	unknown Lea County 3	1
## 1418	unknown Lewis and Clark County	1
## 1419	unknown Lincoln County 1	1
## 1420	unknown Linn County	1
## 1421	unknown Madison County	1
## 1422	unknown Newton County	1
## 1423	unknown Niagara County	1
## 1424	unknown Nome Census Area	1

## 1425	unknown Nueces County	1
## 1426	unknown Palo Alto County	1
## 1427	unknown Pennington County 1	1
## 1428	unknown Pennington County 2	1
## 1429	unknown Pipestone County 3	1
## 1430	unknown Pittsburg County	1
## 1431	unknown Pottawattamie County	1
## 1432	unknown Randolph County	1
## 1433	unknown Red Lake County	1
## 1434	unknown Red Willow County	1
## 1435	unknown San Juan Municipio	1
## 1436	unknown San Miguel County 1	1
## 1437	unknown Scott County	1
## 1438	unknown Scotts Bluff County	1
## 1439	unknown Sioux County	1
## 1440	unknown Snohomish County	1
## 1441	unknown Suffolk County	1
## 1442	unknown Taylor County	1
## 1443	unknown Tulare County	1
## 1444	unknown Upton County	1
## 1445	unknown Wade Hampton County	1
## 1446	unknown Washington County 1	1
## 1447	unknown Watonwan County	1
## 1448	unknown Whatcom County	1
## 1449	unknown Wyoming County	1
## 1450	unknown Yolo County	1
## 1451	unknown Young County 1	1
## 1452	unknown Young County 2	1
## 1453	Valley City Wind Turbine	1
## 1454	Victorville Wind Project	1
## 1455	Wall Lake Municipal Utilities	1
## 1456	Walmart Red Bluff	1
## 1457	Wausau High School	1
## 1458	Waverly III (Skeets 4)	1
## 1459	WED Coventry 1	1
## 1460	WED Coventry 3	1
## 1461	WED Coventry 4	1
## 1462	WED Coventry 5	1
## 1463	WED Portsmouth 1	1
## 1464	West Central School Corporation	1
## 1465	Whirlpool Corporation - Ottawa Wind Farm	1
## 1466	White Earth Tribe	1
## 1467	Williams Stone	1
## 1468	Wilmont Hills	1
## 1469	Winchester	1
## 1470	Wind GEM	1
## 1471	Wind Vision	1
## 1472	Wind Walkers	1
## 1473	Windy Point Iia	1
## 1474	Wing River Wind	1
## 1475	Wicta Wind	1
## 1476	Wolverine	1
## 1477	Woods Hole Research Center	1
## 1478	Woodstock Municipal Wind	1

```
## 1479 Wray School District 1
```

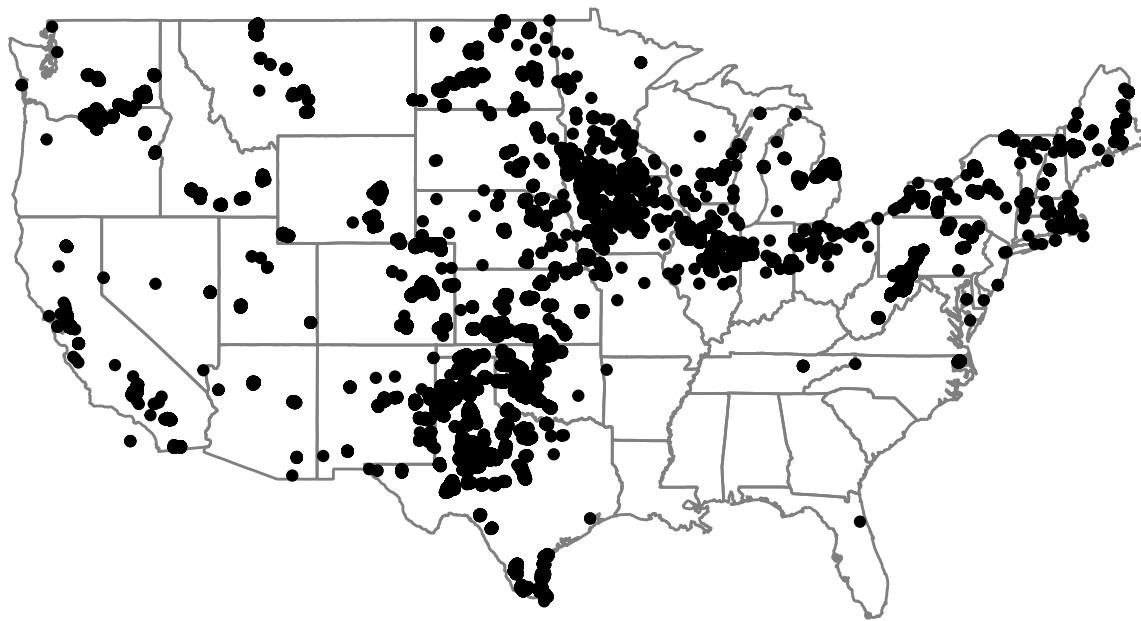
```
us_wind %>%
  count(t_state, sort = TRUE)
```

```
##   t_state     n
## 1      TX 13232
## 2      CA  9037
## 3      IA  4280
## 4      OK  3821
## 5      KS  2898
## 6      IL  2602
## 7      MN  2547
## 8      CO  2278
## 9      OR  1868
## 10     WA  1744
## 11     ND  1644
## 12     IN  1207
## 13     NY  1141
## 14     NM  1088
## 15     MI  1061
## 16     WY  1004
## 17     NE   973
## 18     PA   734
## 19     SD   601
## 20     ID   541
## 21     MO   529
## 22     MT   510
## 23     WI   468
## 24     OH   387
## 25     ME   386
## 26     WV   377
## 27     UT   208
## 28     AZ   144
## 29     AK   141
## 30     HI   124
## 31     NC   105
## 32     MA    88
## 33     MD    80
## 34     NH    75
## 35     VT    73
## 36     NV    70
## 37     PR    63
## 38     RI    25
## 39     TN    18
## 40     NJ     6
## 41     CT     3
## 42     AR     1
## 43     DE     1
## 44     FL     1
## 45     GU     1
```

```
us_wind %>%
  ggplot(aes(xlong, ylat)) +
  borders("state") +
  geom_point() +
  coord_map() +
  theme_void()
```



```
us_wind %>%
  filter(!t_state %in% c("AK", "HI", "GU", "PR")) %>%
  ggplot(aes(xlong, ylat)) +
  borders("state") +
  geom_point() +
  coord_map() +
  theme_void()
```



```

processed_data <- us_wind %>%
  filter(!t_state %in% c("AK", "HI", "GU", "PR"))

processed_data %>%
  group_by(p_name, t_state) %>%
  summarise(turbines = n())

## `summarise()` has grouped output by 'p_name'. You can override using the
## `.groups` argument.

## # A tibble: 1,440 x 3
## # Groups:   p_name [1,425]
##   p_name              t_state turbines
##   <chr>              <chr>     <int>
## 1 251 Wind            CA        190
## 2 30 MW Iowa DG Portfolio IA         10
## 3 6th Space Warning Squadron MA         2
## 4 Adair               IA        76
## 5 Adams               IA        64
## 6 Adams Wind Generations, LLC MN        12
## 7 AFCEE MMR Turbines   MA         2
## 8 AG Land 1            IA         1
## 9 AG Land 2            IA         1
## 10 AG Land 3           IA         1
## # ... with 1,430 more rows

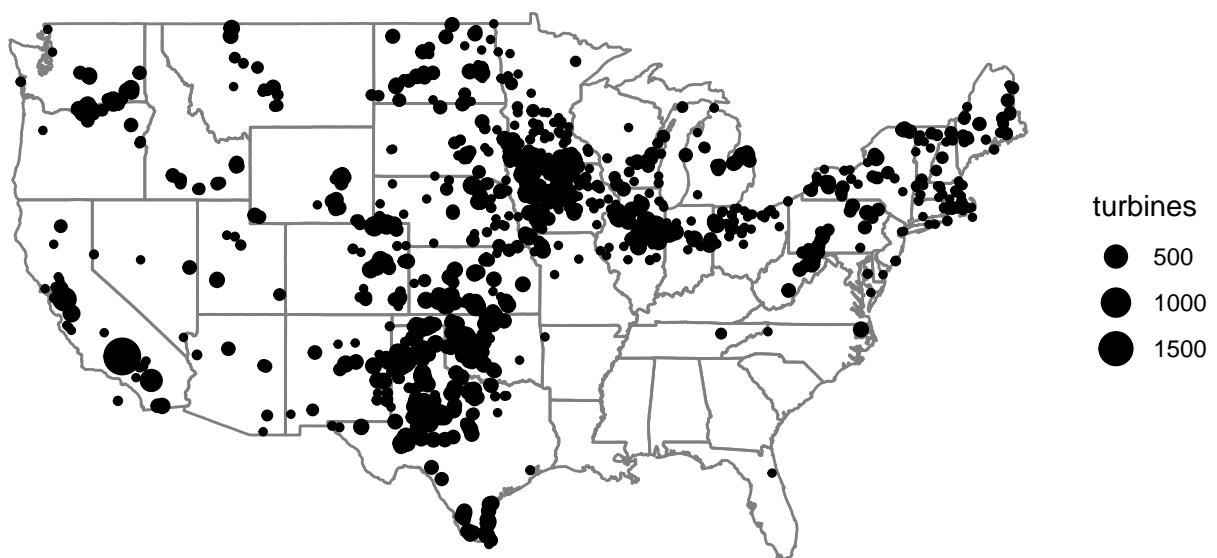
```

```
projects <- processed_data %>%
  group_by(p_name, t_state) %>%
  summarise(turbines = n(),
            lon = mean(xlong),
            lat = mean(ylat),
            lon_sd = sd(xlong),
            lat_sd = sd(ylat))
```

`summarise()` has grouped output by 'p_name'. You can override using the
'.groups' argument.

Data shows that the wind turbines in CA were clustered together (based on the sd), while in IA, the turbines were more spread out.

```
projects %>%
  ggplot(aes(lon, lat, size = turbines)) +
  borders("state") +
  geom_point() +
  coord_map() +
  theme_void()
```



```
processed_data %>%
  distinct(p_name, p_year) %>%
  count(p_name, sort = TRUE)
```

	p_name	n
## 1	San Gorgonio Farms Wind Farm	11
## 2	Oak Creek Energy Systems	4
## 3	Century Expansion	3
## 4	Karen Avenue Windfarm	3
## 5	McNeilus	3
## 6	Medicine Bow	3
## 7	NREL - NWTC	3
## 8	unknown Caddo County	3
## 9	unknown Canadian County	3
## 10	unknown Clark County	3
## 11	unknown Concho County	3
## 12	unknown DeKalb County	3
## 13	unknown Greene County	3
## 14	unknown Lubbock County	3
## 15	unknown Woodward County	3
## 16	Anheuser-Busch Fairfield	2
## 17	Cabazon	2
## 18	Camp Springs II	2
## 19	Camp Williams	2
## 20	Capricorn Ridge	2
## 21	Caprock Wind Ranch	2
## 22	Carleton College	2
## 23	Case Western University	2
## 24	Centennial Wind Farm	2
## 25	Colorado Highlands	2
## 26	Crossroads	2
## 27	Crow Lake	2
## 28	Crystal Lake II	2
## 29	Endeavor	2
## 30	Goldthwaite	2
## 31	Harbec Plastics	2
## 32	Harvest Wind Farm	2
## 33	Horse Hollow II	2
## 34	Kingfisher Wind	2
## 35	Lakeshore Technical College	2
## 36	Lincoln Wind Energy Facility	2
## 37	Lone Star II	2
## 38	Lower Snake River Phase I	2
## 39	Mars Hill	2
## 40	Milo	2
## 41	Missouri River Energy Services (MRES)	2
## 42	Moorhead	2
## 43	Nevada High School	2
## 44	Ocotillo Wind I	2
## 45	Orangeville Wind	2
## 46	Pinnacle	2
## 47	Pioneer Prairie II	2
## 48	Prairie Star	2
## 49	Rolling Hills	2
## 50	Saddleback Ridge	2
## 51	San Clemente Island	2
## 52	Spirit Lake	2
## 53	Stateline Wind Project	2

## 54	Twin Groves II	2
## 55	University of MN -- Morris	2
## 56	unknown Alameda County	2
## 57	unknown Aurora County	2
## 58	unknown Chautauqua County	2
## 59	unknown Dixon County	2
## 60	unknown Elbert County	2
## 61	unknown Erie County	2
## 62	unknown Griggs County	2
## 63	unknown Kern County	2
## 64	unknown Lea County	2
## 65	unknown Montgomery County	2
## 66	unknown Pecos County	2
## 67	unknown Pipestone County	2
## 68	unknown Polk County	2
## 69	unknown Riverside County	2
## 70	unknown Utah County	2
## 71	unknown Walla Walla County	2
## 72	unknown Wayne County	2
## 73	Waverly	2
## 74	Wilton Wind Farm	2
## 75	Windland	2
## 76	251 Wind	1
## 77	30 MW Iowa DG Portfolio	1
## 78	6th Space Warning Squadron	1
## 79	Adair	1
## 80	Adams	1
## 81	Adams Wind Generations, LLC	1
## 82	AFCEE MMR Turbines	1
## 83	AG Land 1	1
## 84	AG Land 2	1
## 85	AG Land 3	1
## 86	AG Land 4	1
## 87	AG Land 5	1
## 88	AG Land 6	1
## 89	Agassiz Beach	1
## 90	Agriwind	1
## 91	Ainsworth Wind Project (NPPD)	1
## 92	Air Force (Barnstable)	1
## 93	Air Force (Laramie)	1
## 94	Akron-Westfield School District	1
## 95	Alexander	1
## 96	Alite Wind Farm	1
## 97	Allegheny Ridge	1
## 98	Alta I	1
## 99	Alta II	1
## 100	Alta III	1
## 101	Alta IV	1
## 102	Alta Mesa 1 and 2	1
## 103	Alta Mesa 3	1
## 104	Alta V	1
## 105	Alta VI (partial)	1
## 106	Alta VIII (partial)	1
## 107	Alta X	1

## 108		Alta XI	1
## 109	Amazon Wind Farm (Fowler Ridge)		1
## 110	Amazon Wind Farm Texas		1
## 111	Amazon Wind Farm US Central		1
## 112	Amazon Wind Farm US East		1
## 113	American Windmill Museum		1
## 114	AMP-Ohio/Green Mountain Energy Wind Farm		1
## 115	Anacacho		1
## 116	Anderson Wind Project		1
## 117	Apogee Stadium Wind		1
## 118	Appalachian State		1
## 119	Apple Blossom		1
## 120	Applied Materials		1
## 121	Aragonne Wind LLC (Pastura)		1
## 122	Arbuckle Mountain		1
## 123	Archbold Local Schools Wind Turbine		1
## 124	Arends Brothers		1
## 125	Armenia Mountain		1
## 126	Arnold Wind Farm		1
## 127	Ashtabula II		1
## 128	Ashtabula III		1
## 129	Ashtabula Wind Center		1
## 130	August Wind Energy LLC		1
## 131	Aurora Wal-Mart		1
## 132	Baffin		1
## 133	Baldwin		1
## 134	Balko Wind		1
## 135	Barnstable Wastewater Treatment Facility		1
## 136	Barstow Marine Logistics Base		1
## 137	Barton		1
## 138	Barton Chapel		1
## 139	Bayonne Wind Energy Project		1
## 140	Bear Creek		1
## 141	Bearkat I		1
## 142	Beaver Creek		1
## 143	Beebe 1B		1
## 144	Beebe Community Wind		1
## 145	Beech Ridge		1
## 146	Beethoven Wind, LLC		1
## 147	Bellevue High School		1
## 148	Benson Creek		1
## 149	Bent Tree		1
## 150	Benton County Wind Farm		1
## 151	Berkshire East Ski Area		1
## 152	Berkshire Wind		1
## 153	Bethel		1
## 154	Big Blue Wind Farm		1
## 155	Big Horn		1
## 156	Big Horn 2		1
## 157	Big Sky Wind		1
## 158	Big Smile Wind Farm at Dempsey Ridge		1
## 159	Big Spring I		1
## 160	Big Spring II		1
## 161	Big Timber		1

## 162	Big Turtle	1
## 163	Big Turtle II	1
## 164	Big Windy	1
## 165	Biglow Canyon I	1
## 166	Biglow Canyon II	1
## 167	Biglow Canyon III	1
## 168	Bingham Lake	1
## 169	Bingham Wind	1
## 170	Birch Power LLC	1
## 171	Bishop Hill I	1
## 172	Bishop Hill II	1
## 173	Bishop Hill III	1
## 174	Bison 1B (2011)	1
## 175	Bison Wind 1A	1
## 176	Bison Wind 1B	1
## 177	Bison Wind 2	1
## 178	Bison Wind 3	1
## 179	Bison Wind 4	1
## 180	Bitworks	1
## 181	Black Oak Getty	1
## 182	Blackstone (Top Crop)	1
## 183	Blackstone (Top Crop) II	1
## 184	Blackwell	1
## 185	BLM-JCI	1
## 186	Block Island	1
## 187	Bloom	1
## 188	Blue Breezes I & II	1
## 189	Blue Canyon I	1
## 190	Blue Canyon II	1
## 191	Blue Canyon V	1
## 192	Blue Canyon VI	1
## 193	Blue Creek	1
## 194	Blue Sky - Green Field	1
## 195	Blue Summit	1
## 196	Bluegrass Ridge	1
## 197	Bluestem	1
## 198	Bluff Point	1
## 199	Bobcat Bluff	1
## 200	Bolton Valley Resort	1
## 201	Border Winds Project	1
## 202	Bowling Green Municipal	1
## 203	Boyce Dairy Farm	1
## 204	Brady Wind I	1
## 205	Brady Wind II	1
## 206	Brahms Wind, LLC	1
## 207	Brazos Wind Ranch	1
## 208	Breckinridge	1
## 209	Briscoe	1
## 210	Broadview Energy JN LLC	1
## 211	Broadview Energy KW LLC	1
## 212	Broken Bow I	1
## 213	Broken Bow II	1
## 214	Brookfield Tehachapi 1 (CCDLP)	1
## 215	Brookfield Tehachapi 2	1

## 216	Brookfield Tehachapi	3	1
## 217	Brookfield Wind Park		1
## 218	Brown County Wind Turbine		1
## 219	Bruenning's Breeze		1
## 220	BTI Wind		1
## 221	Buckeye		1
## 222	Buckthorn		1
## 223	Buena Vista		1
## 224	Buffalo Bear		1
## 225	Buffalo Dunes		1
## 226	Buffalo Gap	3	1
## 227	Buffalo Gap Wind Farm		1
## 228	Buffalo Gap, phase II		1
## 229	Buffalo Mountain		1
## 230	Buffalo Mountain (Windrock)		1
## 231	Buffalo Ridge		1
## 232	Buffalo Ridge II		1
## 233	Buffalo Ridge Wind		1
## 234	Bull Creek		1
## 235	Bull Hill		1
## 236	Bulldog		1
## 237	Burco Farm & Feed		1
## 238	Bureau Valley School District		1
## 239	Burley Butte		1
## 240	Busch Ranch		1
## 241	Butler Ridge		1
## 242	Byers Auto		1
## 243	Byron		1
## 244	California Ridge		1
## 245	California State Prison Los Angeles County		1
## 246	Callahan Divide		1
## 247	Camelot Wind Project		1
## 248	Cameron		1
## 249	Cameron Ridge		1
## 250	Camp Grove		1
## 251	Camp Reed		1
## 252	Camp Springs		1
## 253	Campbell County		1
## 254	Campbell Hill		1
## 255	Canadian Hills		1
## 256	Caney River		1
## 257	Cannon	1	1
## 258	Cannon II		1
## 259	Canton Mountain		1
## 260	Cape Cod Regional Transit Authority		1
## 261	Capricorn Ridge expansion		1
## 262	Carousel		1
## 263	Carroll		1
## 264	Carroll Area		1
## 265	Carthage Wind Turbine		1
## 266	Cashton Greens		1
## 267	Casper Wind Farm		1
## 268	Casselman		1
## 269	Cassia		1

## 270	Cayuga Ridge	1
## 271	Cedar Bluff	1
## 272	Cedar Creek	1
## 273	Cedar Creek II	1
## 274	Cedar Hills	1
## 275	Cedar Point	1
## 276	Cedar Ridge Wind Farm	1
## 277	Cedro Hill	1
## 278	Cemex Black Mountain Quarry	1
## 279	Cemex Madison	1
## 280	Cemex River Plant	1
## 281	Central Community College-Hastings	1
## 282	Central Plains	1
## 283	Century	1
## 284	Cerro Gordo/Hawkeye Power/Clear Lake	1
## 285	Chamberlain Wind Project	1
## 286	Champepaden, Chandler Hills Phase II	1
## 287	Champion	1
## 288	Chanarambie	1
## 289	Chandler Hills Wind Farm	1
## 290	Chapman Ranch	1
## 291	Charles City	1
## 292	Charlestown Wind Turbine	1
## 293	Chestnut Flats	1
## 294	Chisholm View	1
## 295	Chisholm View II	1
## 296	Chopin	1
## 297	Cimarron Bend I	1
## 298	Cimarron Bend II	1
## 299	Cimarron I	1
## 300	Cimarron II	1
## 301	Cirrus	1
## 302	Cisco	1
## 303	City of Howard Wind Turbines	1
## 304	City of Medford	1
## 305	City of Seward	1
## 306	City of Soledad Water Reclamation Facility	1
## 307	Clark Thompson	1
## 308	Clay High School	1
## 309	Cloud County Community College	1
## 310	Cloud Power	1
## 311	Coastal Energy	1
## 312	Cold Springs	1
## 313	Colorado Green Wind Project (Lamar)	1
## 314	Combine Hills I	1
## 315	Combine Hills II	1
## 316	Community Wind North	1
## 317	Community Wind South	1
## 318	Conception Wind Project	1
## 319	Condon Wind Project, phase I	1
## 320	Condon Wind Project, phase II	1
## 321	Conneaut Middle School	1
## 322	Conneaut Waste Water Treatment	1
## 323	Cooper Farms	1

## 324	Cooper Farms Amendment	1
## 325	Coram Energy LLC	1
## 326	Corn Plus	1
## 327	Cotton Plains Wind	1
## 328	Cottonwood Wind	1
## 329	Courtenay	1
## 330	Cow Branch Wind Project	1
## 331	Crane Creek	1
## 332	Crescent Ridge I	1
## 333	Creston Ridge	1
## 334	Creston Ridge Expansion	1
## 335	Crisfield Waste Water Treatment Plant	1
## 336	Criterion	1
## 337	Crofton Bluffs	1
## 338	Cross Winds	1
## 339	Cross Winds Energy Park	1
## 340	Cross Winds Energy Park II	1
## 341	Crystal Lake I	1
## 342	Crystal Lake III	1
## 343	Cumberland Rose	1
## 344	Cuyahoga County Fairgrounds	1
## 345	Danielson	1
## 346	Day County Wind Project	1
## 347	Deerfield	1
## 348	Deerfield Wind	1
## 349	Delaware Mts.	1
## 350	Department of Correction, NCCI Gardner	1
## 351	Desert Hot Springs	1
## 352	Desert Sky	1
## 353	DeWind Little Pringle #1	1
## 354	DeWind Little Pringle #2	1
## 355	DH Blattner Headquarters	1
## 356	Diablo Winds	1
## 357	Diamond Willow extension	1
## 358	Diamond Willow Wind	1
## 359	Difwind	6
## 360	DifWind Farms Ltd. I	1
## 361	DifWind Farms Ltd. II	1
## 362	DifWind Farms Ltd. IIA	1
## 363	DifWind Farms Ltd. V	1
## 364	Dillon	1
## 365	Dinosaur Point	1
## 366	Doerfler Farms	1
## 367	Don Sneve Wind Farms	1
## 368	Drift Sand	1
## 369	Dry Lake	1
## 370	Dry Lake II	1
## 371	Dunlap	1
## 372	Durbin Creek	1
## 373	Dutch Energy	1
## 374	Dutch Hill/Cohocton	1
## 375	Dynapower	1
## 376	Dynapower 1	1
## 377	East Ridge	1

## 378	East Winds	1
## 379	Echo	1
## 380	Echo 1-7	1
## 381	Echo 8-9	1
## 382	Eclipse	1
## 383	EcoGrove	1
## 384	EDF Renewable V	1
## 385	Edom Hills (repower)	1
## 386	El Cabo	1
## 387	El Dorado Wind Power	1
## 388	Elbow Creek Wind Farm	1
## 389	Eldora-New Providence Schools	1
## 390	Electra Wind	1
## 391	Elk	1
## 392	Elk City	1
## 393	Elk City II	1
## 394	Elk River	1
## 395	Elkhorn Ridge	1
## 396	Elkhorn Valley (08)	1
## 397	Elkhorn Valley (La Grande)	1
## 398	Elm Creek	1
## 399	Elm Creek II	1
## 400	Endeavor II	1
## 401	Enron Earth Smart/Green Power	1
## 402	Ensign	1
## 403	Eolos	1
## 404	Equity Industrial Partners	1
## 405	Erie Community School District	1
## 406	Erie Industrial Park	1
## 407	Eswood School	1
## 408	EUI Management	1
## 409	Evanston (Wyoming Wind Energy Center)	1
## 410	Evansville WWTP	1
## 411	Ewington	1
## 412	Exelon Wind	11
## 413	F.E. Warren Air Force Base	1
## 414	Fair Wind	1
## 415	Fairfield Wind Farm	1
## 416	Fairhaven Wind	1
## 417	Fairmont Wind (SMMPA)	1
## 418	Falmouth II	1
## 419	Falmouth Notus	1
## 420	Falmouth Wastewater	1
## 421	Falvez Astra	1
## 422	Farmer's	1
## 423	Farmers' coops/Westridge	1
## 424	Farmers City	1
## 425	Federated Rural Electric	1
## 426	Fenner Wind Power Project	1
## 427	Fenner Wind Power Project - Repower	1
## 428	Fenton	1
## 429	FHSU Wind	1
## 430	Field's Point Wastewater Treatment Facilit	1
## 431	Flat Ridge 2	1

## 432	Flat Ridge 2 Expansion	1
## 433	Flat Ridge Wind Farm	1
## 434	Flat Top	1
## 435	Flat Water	1
## 436	Fluvanna I	1
## 437	Flying Cloud	1
## 438	Foote Creek 3	1
## 439	Foote Creek 4	1
## 440	Foote Creek Rim I	1
## 441	Foote Creek Rim II	1
## 442	Forbes Park	1
## 443	Forest City High School	1
## 444	Forest Creek Wind Project	1
## 445	Fort Hays State University	1
## 446	Fort Huachuca	1
## 447	Forward	1
## 448	Forward Fontanelle	1
## 449	Forward Wind Project	1
## 450	Fossil Gulch	1
## 451	Fourmile Ridge	1
## 452	Fowler Ridge I	1
## 453	Fowler Ridge II	1
## 454	Fox Islands	1
## 455	Franklin County	1
## 456	Frisco	1
## 457	Frontier I	1
## 458	Future Generation Wind	1
## 459	G. McNeilus Wind Farm	1
## 460	Gaines Cavern Wind Project	1
## 461	Galactic Wind	1
## 462	Garnet Wind Project	1
## 463	Geneseo Wind Farm	1
## 464	Georgia Mountain	1
## 465	GL Wind	1
## 466	Glacier Hills	1
## 467	Glacier I	1
## 468	Glacier Wind II	1
## 469	Glenrock	1
## 470	Glenrock III	1
## 471	Goat Phase I	1
## 472	Goat Phase II	1
## 473	GobNob	1
## 474	Golden Acorn Casino	1
## 475	Golden Hills	1
## 476	Golden Hills North	1
## 477	Golden Spread Panhandle Wind Ranch	1
## 478	Golden Valley	1
## 479	Golden West Wind Farm	1
## 480	Goodland I	1
## 481	Goodnoe Hills	1
## 482	Goodwell	1
## 483	Gordon Butte	1
## 484	Goshen North	1
## 485	Grafton Technical College	1

## 486	Grand Meadow	1
## 487	Grand Ridge	1
## 488	Grand Ridge II	1
## 489	Grand Ridge III/IV	1
## 490	Grande Prairie	1
## 491	Grandview I	1
## 492	Grandview II (Colbeck's Corner)	1
## 493	Granite Reliable Power	1
## 494	Grant County	1
## 495	Grant Plains	1
## 496	Grant Wind	1
## 497	Gratiot	1
## 498	Gratiot County	1
## 499	Gray County Wind Farm Montezuma)	1
## 500	Great Lakes Science Center	1
## 501	Great River Energy Headquarters	1
## 502	Great Western	1
## 503	Green Energy Machine	1
## 504	Green Mountain Power	1
## 505	Green Mountain Wind Farm	1
## 506	Green Pastures I	1
## 507	Green Pastures II	1
## 508	Green Power	1
## 509	Green Ridge Power	1
## 510	Greenfield Wind	1
## 511	Greenfield Wind Farm	1
## 512	Greensburg	1
## 513	Groton	1
## 514	GSA	1
## 515	GSG Wind Farm	1
## 516	Gulf Wind	1
## 517	Gunsight	1
## 518	Guthrie WWTP	1
## 519	GWE, LLC	1
## 520	H & S - Tehachapi	1
## 521	Hackberry	1
## 522	Half Hollow Nursery	1
## 523	Hancock	1
## 524	Hancock County Wind Farm	1
## 525	Happy Jack	1
## 526	Harbor Wind	1
## 527	Hardin-Hilltop	1
## 528	Hardscrabble	1
## 529	Harpster Wind	1
## 530	Harvest II	1
## 531	Hasslebach Meats	1
## 532	Hatchett Ridge	1
## 533	Haviland Wind Project	1
## 534	Hawkeye	1
## 535	Hay Canyon	1
## 536	Headwaters	1
## 537	Heartland Community College	1
## 538	Hereford 1	1
## 539	Heritage Flight	1

## 540	Heritage Garden	1
## 541	Hidalgo (Los Mirasoles)	1
## 542	Hidalgo II (Los Mirasoles)	1
## 543	High Lonesome	1
## 544	High Mesa	1
## 545	High Plains	1
## 546	High Plains Tech Center	1
## 547	High Sheldon	1
## 548	High Winds	1
## 549	Highland I	1
## 550	Highland II	1
## 551	Highland North	1
## 552	Highland Wind Project	1
## 553	Hilltop Power	1
## 554	Hodges Badge	1
## 555	Hog Creek	1
## 556	Holy Name Catholic High School	1
## 557	Hometown WindPower Anoka	1
## 558	Hometown WindPower Arlington	1
## 559	Hometown WindPower Brownston	1
## 560	Hometown WindPower Buffalo	1
## 561	Hometown WindPower Chaska	1
## 562	Hometown WindPower East Grand Forks	1
## 563	Hometown WindPower Faribault	1
## 564	Hometown WindPower North St. Paul	1
## 565	Hometown WindPower Olivia	1
## 566	Hometown WindPower Shakopee	1
## 567	Hometown WindPower Winthrop	1
## 568	Honda Plant	1
## 569	Hoopeston Wind	1
## 570	Hoosac	1
## 571	Hoosier	1
## 572	Hopkins Ridge I	1
## 573	Hopkins Ridge II	1
## 574	Hopkins Ridge Wind Project	1
## 575	Horse Butte	1
## 576	Horse Creek Wind	1
## 577	Horse Hollow III	1
## 578	Horse Hollow Wind Energy Center	1
## 579	Horseshoe Bend	1
## 580	Horseshoe Bend/ranch pit	1
## 581	Howard	1
## 582	Hueco Mountain Wind Ranch	1
## 583	Huerfano River	1
## 584	Hull I	1
## 585	Hull Wind Phase II	1
## 586	Huron Schools	1
## 587	Hyannis Country Garden	1
## 588	IBEW local 103	1
## 589	Ida Grove	1
## 590	IDGWP	1
## 591	Illinois Rural Electric Cooperative	1
## 592	Inadale (Roscoe IV)	1
## 593	Indian Mesa	1

## 594	Indian Mesa / Aeolus	1
## 595	Inland Empire Utility Agency	1
## 596	International Turbine Research Center	1
## 597	Intrepid	1
## 598	Intrepid Expansion	1
## 599	Iowa Lakes Community College	1
## 600	Iowa Lakes Lakota Wind	1
## 601	Iowa Lakes Superior Wind	1
## 602	Iowa State Fair Wind Project	1
## 603	Ipswich	1
## 604	Ipswich II	1
## 605	Ironwood I	1
## 606	Javelina	1
## 607	Javelina II	1
## 608	JD Wind 10	1
## 609	JD Wind 11	1
## 610	JD Wind 4	1
## 611	JD Wind 7	1
## 612	JD Wind 8	1
## 613	JD WInd 9	1
## 614	JD Wind Phase V	1
## 615	JD Wind VI	1
## 616	Jeffers	1
## 617	Jericho Mountain	1
## 618	Jericho Rise	1
## 619	Jersey Atlantic Wind Farm	1
## 620	Jett Creek	1
## 621	Jiminy Peak Ski Resort	1
## 622	JJN Wind Farm	1
## 623	Judith Gap	1
## 624	Jumbo Road	1
## 625	Junction Hilltop Wind	1
## 626	Juniper Canyon	1
## 627	Kalamazoo Valley Community College	1
## 628	Kas Farms	1
## 629	Kay Wind	1
## 630	Keechi	1
## 631	Keenan II	1
## 632	Kelly Creek	1
## 633	Kenston School District	1
## 634	Kibby Mountain II	1
## 635	Kibby Mountain, phase I	1
## 636	Kimball Wind Farm	1
## 637	King Mtn. Wind Ranch	1
## 638	Kingdom Community Wind	1
## 639	Kingman	1
## 640	Kingman Wind Energy Center	1
## 641	Kingston	1
## 642	Kirkwood Community College	1
## 643	Kit Carson Project	1
## 644	Klondike I	1
## 645	Klondike II	1
## 646	Klondike III	1
## 647	Klondike IIIA	1

## 648	KODE Novus I	1
## 649	KODE Novus II	1
## 650	Kumeyaay Phase I	1
## 651	Lac qui Parle Valley School	1
## 652	Lake Benton I	1
## 653	Lake Benton II	1
## 654	Lake Palmdale	1
## 655	Lake Region State College Wind Turbine	1
## 656	Lake Winds	1
## 657	Lakefield	1
## 658	Lakeswind	1
## 659	Lakeview Ridge	1
## 660	Lakota Ridge	1
## 661	Lakota Wind	1
## 662	Lamar III	1
## 663	Lamar Municipal	1
## 664	Langdon	1
## 665	Langdon - OTP	1
## 666	Langdon II	1
## 667	Langford	1
## 668	Laredo Ridge	1
## 669	Latigo	1
## 670	Laurel	1
## 671	Laurel Hill	1
## 672	Laurel Mountain	1
## 673	Leaning Juniper	1
## 674	Leaning Juniper II	1
## 675	Lee/DeKalb	1
## 676	Lempster	1
## 677	Lenox Municipal Utilities	1
## 678	Lime Wind	1
## 679	Limon I	1
## 680	Limon II	1
## 681	Limon III	1
## 682	Lincoln County	1
## 683	Lincoln Electric	1
## 684	Lindahl	1
## 685	Linden	1
## 686	Little Cedar	1
## 687	Little Elk	1
## 688	Llano Estacado Wind Ranch at Texico	1
## 689	Llano Estacado Wind Ranch at Texico II	1
## 690	Llano Estacado Wind Ranch at White Deer	1
## 691	LLC 1	1
## 692	LLC 2	1
## 693	Locust Ridge	1
## 694	Locust Ridge II	1
## 695	Loess Hills Wind Project	1
## 696	Logan's Gap Wind	1
## 697	Lone Star I	1
## 698	Longhorn	1
## 699	Lookout	1
## 700	Lorraine	1
## 701	Lorraine II	1

## 702	Los Vientos I	1
## 703	Los Vientos II	1
## 704	Los Vientos III	1
## 705	Los Vientos IV	1
## 706	Los Vientos V	1
## 707	Lost Creek Ridge Wind Farm	1
## 708	Lost Lakes Wind Farm	1
## 709	Lower Davenport	1
## 710	Lubbock Wind Ranch	1
## 711	Lundgren	1
## 712	Luther College	1
## 713	Luverne	1
## 714	LWSC Wind Turbine	1
## 715	Macho Springs Wind Farm I	1
## 716	Mackinaw City	1
## 717	Mackinaw City (Bay Windpower I)	1
## 718	Macksburg	1
## 719	Madison Windpower	1
## 720	Magic Valley	1
## 721	Majestic	1
## 722	Majestic II	1
## 723	Mammoth Plains	1
## 724	Manzana Winds	1
## 725	Maple Ridge	1
## 726	Maple Ridge (Lowville)	1
## 727	Marble River	1
## 728	Marengo I	1
## 729	Marengo II	1
## 730	Margaretta Elementary School	1
## 731	Mariah North Wind	1
## 732	Mark Richey Woodworking	1
## 733	Marsh Hill	1
## 734	Marshall	1
## 735	Marshall Wind Energy	1
## 736	Martinsdale Colony South	1
## 737	Martinsdale Wind Farm	1
## 738	Mason Wind LLC Dyersville	1
## 739	Mason Wind LLC Fairbank	1
## 740	Mason Wind LLC Mason City	1
## 741	Mason Wind LLC Perry	1
## 742	Massachusetts Maritime Academy	1
## 743	Massachusetts National Cemetery	1
## 744	McAdoo	1
## 745	McEvoy Ranch	1
## 746	McFadden Ridge	1
## 747	McKinley Wind Park	1
## 748	Meadow Creek	1
## 749	Meadow Lake	1
## 750	Meadow Lake II	1
## 751	Meadow Lake III	1
## 752	Meadow Lake IV	1
## 753	Meadow Lake V	1
## 754	Meadow Ridge	1
## 755	Mehoopany	1

## 756	Mendota Hills	1
## 757	Meridian Way	1
## 758	Meridian Way II	1
## 759	Mesa Wind Farm	1
## 760	Mesalands	1
## 761	Mesquite Creek	1
## 762	Method Manufacturing Plant	1
## 763	Metro Wind, LLC	1
## 764	Meyersdale	1
## 765	Miami	1
## 766	Michigan Wind I	1
## 767	Michigan Wind II	1
## 768	Milford Phase I	1
## 769	Milford Phase II	1
## 770	Mill Run Wind	1
## 771	Mill Run Windpower LLC	1
## 772	Milner Dam	1
## 773	Minco II	1
## 774	Minco III	1
## 775	Minco Wind	1
## 776	Minden Wind Park	1
## 777	Minn-Dakota	1
## 778	Minnesota Wind Share	1
## 779	Minnkota Power Cooperative	1
## 780	Minonk	1
## 781	MinWind I & II	1
## 782	MinWind III-IX	1
## 783	Montezuma	1
## 784	Montezuma Winds II	1
## 785	Montfort Wind Farm	1
## 786	Moraine II	1
## 787	Moraine Wind Power project	1
## 788	Morning Light	1
## 789	Moulton, Chandler Hills Wind Farm Phase II	1
## 790	Mount St. Mary's Abbey	1
## 791	Mount Wachusett Wind Farm	1
## 792	Mountain Home	1
## 793	Mountain Lake Wind	1
## 794	Mountain Peak Special Utility District	1
## 795	Mountain View Grand	1
## 796	Mountain View IV	1
## 797	Mountain View Power Partners I	1
## 798	Mountain View Power Partners I & II	1
## 799	Mountain View Power Partners II	1
## 800	Mountain View Power Partners III	1
## 801	Mountain Wind I	1
## 802	Mountain Wind II	1
## 803	Mountaineer Wind Energy Center (Thomas)	1
## 804	Mower County Wind Energy Center	1
## 805	Mozart	1
## 806	Munnsville	1
## 807	Musselshell I	1
## 808	Musselshell II	1
## 809	Mustang Hills	1

## 810	MUTI	1
## 811	MUTI Wind Turbine	1
## 812	MWRA Deer Island	1
## 813	Nantucket High School	1
## 814	Nature's Classroom Wind Turbine	1
## 815	NedPower Mount Storm, Phase I	1
## 816	NedPower Mount Storm, Phase II	1
## 817	Neppel Wind Power Project	1
## 818	Nestle Waters	1
## 819	New Creek Wind	1
## 820	New England Tech	1
## 821	New Harvest	1
## 822	New London	1
## 823	New Mexico Wind Energy Center	1
## 824	New York State Thruway Authority	1
## 825	NEXGEN	1
## 826	Nine Canyon	1
## 827	Nine Canyon I	1
## 828	Nine Canyon II	1
## 829	Nine Canyon III	1
## 830	Ninnescah	1
## 831	No Fossil Fuel - Kingston	1
## 832	Noble Altona	1
## 833	Noble Bliss	1
## 834	Noble Chateaugay	1
## 835	Noble Clinton	1
## 836	Noble Ellenburg	1
## 837	Noble Great Plains	1
## 838	Noble Wethersfield	1
## 839	Nobles	1
## 840	Nobles Cooperative Electric	1
## 841	Nordex Energy	1
## 842	NORESCO	1
## 843	Norgaard	1
## 844	Norgaard (7 Projects)	1
## 845	North Allegheny	1
## 846	North Dakota Wind I	1
## 847	North Dakota Wind II	1
## 848	North Hurlburt	1
## 849	North Kingstown Green	1
## 850	North Newton School Corporation	1
## 851	North Shaokatan Wind Farm	1
## 852	North Sky River	1
## 853	Northeast Colorado Wind	1
## 854	Northwestern School Corporation	1
## 855	Notrees	1
## 856	O'Brien	1
## 857	Oak Creek	1
## 858	Oak Glen Wind Project	1
## 859	Oak Tree	1
## 860	Oakfield Wind	1
## 861	Oasis	1
## 862	Oasis Power Partners	1
## 863	Ocotillo	1

## 864		Odell	1
## 865		Odin	1
## 866	OK Wind Energy Center(mooreland)		1
## 867		Old Settler Wind	1
## 868	Oliver County Wind Energy Center		1
## 869		Oliver II	1
## 870		Oliver III	1
## 871		Olsen Farms	1
## 872		Omaha Public	1
## 873		ONU Wind	1
## 874		Oregon Trail	1
## 875		Origin	1
## 876		Osage Utilities	1
## 877		Osage Wind	1
## 878		Osborn	1
## 879	Other World Computing		1
## 880	Otis Wind Energy Project		1
## 881		OU Spirit	1
## 882		Pacific Wind	1
## 883		Painted Hills	1
## 884	Palm Springs (repower)		1
## 885		Palo Duro	1
## 886		Palouse	1
## 887		Panhandle Wind 1	1
## 888		Panhandle Wind 2	1
## 889	Pantex Renewable Energy Project		1
## 890		Panther Creek I	1
## 891		Panther Creek II	1
## 892		Panther Creek III	1
## 893		Papalote Creek	1
## 894	Papaolote Creek II		1
## 895		Passadumkeag	1
## 896		Patriot	1
## 897		Patterson Pass	1
## 898		Patterson Wind	1
## 899		Patton Wind Farm	1
## 900		PaTu Wind Farm	1
## 901		Payne's Ferry	1
## 902		Peak View Wind	1
## 903		Pebble Springs	1
## 904		Peetz Table	1
## 905	Peetz Table Wind Farm		1
## 906	Pembina Border Station		1
## 907		Penescal	1
## 908		Penescal II	1
## 909		Perrin Ranch	1
## 910		Petersburg	1
## 911	Pettisville Local Schools		1
## 912		Pheasant Run I	1
## 913		Philips Lightolier	1
## 914		Phoenix Press	1
## 915	Pick-a-Part Turbine		1
## 916		Pigeon Creek	1
## 917	Pilgrim Stage Station		1

## 918	Pilot Hill	1
## 919	Pine Ridge Job Corp	1
## 920	Pine Tree extension	1
## 921	Pine Tree Wind Farm	1
## 922	Pinnebog	1
## 923	Pinyon Pines I	1
## 924	Pinyon Pines II	1
## 925	Pioneer Grove	1
## 926	Pioneer Prairie I	1
## 927	Pioneer Trail	1
## 928	Pioneer Wind Park	1
## 929	Pipestone School District	1
## 930	Pisgah Mountain	1
## 931	Pleasant Hill	1
## 932	Pleasant Valley	1
## 933	Pocahontas Prairie	1
## 934	Pomeroy (expansion)	1
## 935	Pomeroy I	1
## 936	Pomeroy II	1
## 937	Pomeroy III	1
## 938	Ponnequin (EUI)	1
## 939	Ponnequin (PSCo)	1
## 940	Ponnequin 1 and 2	1
## 941	Port of Milwaukee	1
## 942	Porta High School	1
## 943	Portsmouth Abbey School	1
## 944	Post Rock	1
## 945	Power County	1
## 946	Prairie	1
## 947	Prairie Breeze	1
## 948	Prairie Breeze II	1
## 949	Prairie Breeze III	1
## 950	Prairie II	1
## 951	Prairie Rose	1
## 952	Prairie Winds Minot Wind 2	1
## 953	Prairie Winds ND 1	1
## 954	PrairieWinds Minot Wind 1	1
## 955	Presque Isle	1
## 956	Princeton Municipal Light and Water Plant	1
## 957	Prospector	1
## 958	Providence Heights	1
## 959	Pueblo Towers	1
## 960	PYCO Soaring Wind Farm	1
## 961	Pyron (Roscoe III)	1
## 962	Quilt Block	1
## 963	Radford's Run	1
## 964	Rail Splitter	1
## 965	Ralls Wind Farm	1
## 966	Randolph Eastern School Corporation	1
## 967	Rattlesnake	1
## 968	Rattlesnake Road	1
## 969	Rattlesnake Wind	1
## 970	Record Hill	1
## 971	Red Canyon Wind Energy	1

## 972	Red Dirt	1
## 973	Red Hills	1
## 974	Red Horse	2
## 975	Red Mesa	1
## 976	Red Pine	1
## 977	Redbed Plains	1
## 978	Redwood Falls (SMMPA)	1
## 979	Richland Community College	1
## 980	Ridgewind	1
## 981	Rim Rock	1
## 982	Ringer Hill	1
## 983	Rippey	1
## 984	Rising Tree North	1
## 985	Rising Tree South	1
## 986	Robertsons Ready Mix	1
## 987	Rock Creek	1
## 988	Rock Falls	1
## 989	Rock of Ages	1
## 990	Rock River I	1
## 991	Rockland	1
## 992	Rocksprings	1
## 993	Rocky Ridge I	1
## 994	Roeder Farms	1
## 995	Rollins	1
## 996	Roosevelt	1
## 997	Roscoe	1
## 998	Rosebud Sioux	1
## 999	Roseman Energy LLC	1
## 1000	Rosiere Wind Farm	1
## 1001	Roth Rock	1
## 1002	Route 66	1
## 1003	Rugby	1
## 1004	Rush Springs Wind Energy Center	1
## 1005	Ruthton Wind Farm	1
## 1006	Sacred Heart Monestary	1
## 1007	Safeway Tracy	1
## 1008	Sagebrush (Kittitas Valley)	1
## 1009	Salmon Falls	1
## 1010	Salt Fork	1
## 1011	San Gorgonio Westwinds II LLC	1
## 1012	San Gorgonio Wind Associates 7	1
## 1013	San Jacinto Power Company	1
## 1014	San Juan Mesa	1
## 1015	San Roman	1
## 1016	Sand Bluff	1
## 1017	Sandy Ridge	1
## 1018	Sandywoods	1
## 1019	Santa Clara	1
## 1020	Santa Fe Public Works	1
## 1021	Santa Rita	1
## 1022	Sawtooth	1
## 1023	SC Johnson Waxdale Plant	1
## 1024	Scheid Vineyards	1
## 1025	Scituate Wind	1

## 1026	Searsburg	1
## 1027	Seiling	1
## 1028	Seiling	2
## 1029	Senate	1
## 1030	Sendero	1
## 1031	Seneca Nation	1
## 1032	Sentral Community School	1
## 1033	Settler's Trail	1
## 1034	Seven Mile Hill I	1
## 1035	Seven Mile Hill I & II	1
## 1036	Shady Oaks	1
## 1037	Shakopee Mdewakanton Sioux	1
## 1038	Shakopee Mdewakanton Sioux Community Wind	1
## 1039	Shannon	1
## 1040	Shaokatan Hills	1
## 1041	Shaokatan Power Partners	1
## 1042	Sheffield	1
## 1043	Shenandoah School Corporation	1
## 1044	Shepherds Flat	1
## 1045	Sherbino I	1
## 1046	Sherbino II	1
## 1047	Sherrard High School	1
## 1048	Shiloh II	1
## 1049	Shiloh III	1
## 1050	Shiloh IV	1
## 1051	Shiloh Wind Project	1
## 1052	Shirley	1
## 1053	Shooting Star	1
## 1054	Sibley Hills	1
## 1055	Sibley Wind Farm	1
## 1056	Sigel Wind Park	1
## 1057	Silver Sage	1
## 1058	Silver Star I	1
## 1059	Sky River	1
## 1060	Sky Volt	1
## 1061	Slate Creek	1
## 1062	Sleeping Bear	1
## 1063	Smoky Hills	1
## 1064	Smoky Hills II	1
## 1065	Snyder	1
## 1066	Solano Phase 3	1
## 1067	Solano Phase IIA	1
## 1068	Solano Wind Project	1
## 1069	Solano Wind Project, Phase I	1
## 1070	Solano Wind Project, Phase IA	1
## 1071	Somerset	1
## 1072	South Chestnut	1
## 1073	South Dakota	1
## 1074	South Dakota Wind Partners	1
## 1075	South Fork	1
## 1076	South Hurlburt	1
## 1077	South Plains	1
## 1078	South Plains II	1
## 1079	South Trent Mesa	1

## 1080	Southwest Mesa	1
## 1081	Spanish Fork	1
## 1082	Spearville	1
## 1083	Spearville	3
## 1084	Spearville	1
## 1085	Spearville	II
## 1086	Spinning Spur	2
## 1087	Spinning Spur	3
## 1088	Spinning Spur Wind Ranch	1
## 1089	Spion Kop	1
## 1090	Spring Canyon	1
## 1091	Spring Canyon Expansion	1
## 1092	Spring Valley	1
## 1093	Springview II Wind Facility	1
## 1094	Spruce Mountain	1
## 1095	St. Cloud VA Medical Center	1
## 1096	St. Olaf College	1
## 1097	Stanton Energy Center	1
## 1098	Star Point	1
## 1099	Steel Winds	1
## 1100	Steel Winds II	1
## 1101	Steele Flats	1
## 1102	Stephens Ranch	1
## 1103	Stephens Ranch	II
## 1104	Sterling Phase I	1
## 1105	Stetson	1
## 1106	Stetson Wind expansion	1
## 1107	Stoney Corners	1
## 1108	Stoney Corners - Repower	1
## 1109	Stoney Corners	II
## 1110	Stoney Corners	III
## 1111	Stony Creek	1
## 1112	Storm Lake	I
## 1113	Storm Lake	II
## 1114	Story City Wind	1
## 1115	Story County	1
## 1116	Story County Medical Center	1
## 1117	Story II (aka Garden Wind)	1
## 1118	Stuart	1
## 1119	Sunflower	1
## 1120	Sunray	I
## 1121	Sunray	II
## 1122	Superior Farms	1
## 1123	Sustainable Technologies Museum (Turbine A	1
## 1124	Suzlon Project	VII
## 1125	Swauk Valley	1
## 1126	Sweetwater	1
## 1127	Sweetwater IVa	1
## 1128	Sweetwater IVb	1
## 1129	Sweetwater Phase	II
## 1130	Sweetwater Phase	III
## 1131	Sweetwater	V
## 1132	Taconite Ridge Energy Center	1
## 1133	Talbot County DPW	1

## 1134	Taloga	1
## 1135	Tatanka	1
## 1136	Taylor Farms	1
## 1137	Tehachapi Hills	1
## 1138	Tehachapi Hills (85A)	1
## 1139	Tehachapi Hills (85B)	1
## 1140	Tehachapi Windplant I	1
## 1141	Tehachapi Windplant II	1
## 1142	Teichert Aggregates	1
## 1143	Templeton Wind Turbine	1
## 1144	Testa Produce	1
## 1145	Texas Tech - Nolan	1
## 1146	The City of Union City	1
## 1147	Tholen & Petersen	1
## 1148	Thousands Springs	1
## 1149	Three D Metals Corporation	1
## 1150	Threemile Canyon	1
## 1151	Thunder Ranch	1
## 1152	Thunder Spirit	1
## 1153	Timber Road II	1
## 1154	Time Factory Wind	1
## 1155	Tippecanoe Valley School Corporation	1
## 1156	Titan I	1
## 1157	TJ Automation	1
## 1158	Tjaden Farms	1
## 1159	Tooele Army Depot II	1
## 1160	Top of Iowa	1
## 1161	Top of Iowa II	1
## 1162	Top of Iowa III	1
## 1163	Top of the World	1
## 1164	Town of Richland	1
## 1165	Traer Wind	1
## 1166	Traverse City	1
## 1167	Trent Mesa	1
## 1168	Trimont Wind	1
## 1169	Trinity Hills	1
## 1170	Tuana Gulch	1
## 1171	Tuana Springs	1
## 1172	Tucannon River	1
## 1173	Tule	1
## 1174	Turbine EVE	1
## 1175	Turkey Hill Frey Farm	1
## 1176	Turkey Track	1
## 1177	Turtle Mountain College	1
## 1178	Tuscola Bay Wind	1
## 1179	Tuscola II	1
## 1180	Twin Buttes	1
## 1181	Twin Buttes II	1
## 1182	Twin Groves I	1
## 1183	Twin Ridges	1
## 1184	Two Dot	1
## 1185	Two Dot wind farm	1
## 1186	Tyler Bluff	1
## 1187	Uilk Wind Farm	1

## 1188	UL Advanced Wind Turbine Test Facility	1
## 1189	University of Delaware	1
## 1190	University of Massachusetts Dartmouth	1
## 1191	University of Toledo Wind Turbine	1
## 1192	unknown Adams County	1
## 1193	unknown Addison County	1
## 1194	unknown Alameda County 2 NEG Micon 60KW	1
## 1195	unknown Alameda County 250KW	1
## 1196	unknown Alameda County 65KW	1
## 1197	unknown Alameda County Bonus	1
## 1198	unknown Alameda County EnerTech	1
## 1199	unknown Allegany County	1
## 1200	unknown Antelope County	1
## 1201	unknown Armstrong County	1
## 1202	unknown Atchison County	1
## 1203	unknown Bailey County	1
## 1204	unknown Benton County	1
## 1205	unknown Black Hawk County	1
## 1206	unknown Brown County	1
## 1207	unknown Brule County	1
## 1208	unknown Buena Vista County	1
## 1209	unknown Bureau County	1
## 1210	unknown Butler County	1
## 1211	unknown Cameron County	1
## 1212	unknown Cass County	1
## 1213	unknown Cayuga County	1
## 1214	unknown Cerro Gordo County	1
## 1215	unknown Champaign County	1
## 1216	unknown Chaves County	1
## 1217	unknown Cherokee County	1
## 1218	unknown Cheyenne County	1
## 1219	unknown Clay County	1
## 1220	unknown Clinton County	1
## 1221	unknown Codington County	1
## 1222	unknown Collin County	1
## 1223	unknown Collins County	1
## 1224	unknown Columbia County	1
## 1225	unknown Contra Costa County	1
## 1226	unknown Curry County	1
## 1227	unknown Dakota County	1
## 1228	unknown Darke County	1
## 1229	unknown Dewey County	1
## 1230	unknown Dickey County	1
## 1231	unknown Doniphan County	1
## 1232	unknown Donley County	1
## 1233	unknown El Paso County	1
## 1234	unknown Ellis County	1
## 1235	unknown Fillmore County	1
## 1236	unknown Flagler County	1
## 1237	unknown Ford County	1
## 1238	unknown Garden County	1
## 1239	unknown Gratiot County	1
## 1240	unknown Gray County	1
## 1241	unknown Greeley County	1

## 1242	unknown Greenbrier County	1
## 1243	unknown Grundy County	1
## 1244	unknown Guthrie County	2
## 1245	unknown Hancock County	1
## 1246	unknown Hansford County	1
## 1247	unknown Harris County	1
## 1248	unknown Harvey County	1
## 1249	unknown Haskell County	1
## 1250	unknown Hidalgo County	1
## 1251	unknown Hooker County	1
## 1252	unknown Isabella County	1
## 1253	unknown Jackson County	1
## 1254	unknown Jasper County	1
## 1255	unknown Johnson County	1
## 1256	unknown Johnson County	3
## 1257	unknown Kenedy County	1
## 1258	unknown Kent County	1
## 1259	unknown Kingman County	1
## 1260	unknown Kings County	1
## 1261	unknown Kiowa County	1
## 1262	unknown Kit Carson County	1
## 1263	unknown Lamb County	1
## 1264	unknown Lancaster County	1
## 1265	unknown Lander County	1
## 1266	unknown Lea County	1
## 1267	unknown Lea County	2
## 1268	unknown Lea County	3
## 1269	unknown Lewis and Clark County	1
## 1270	unknown Lewis County	1
## 1271	unknown Lincoln County	1
## 1272	unknown Lincoln County	1
## 1273	unknown Linn County	1
## 1274	unknown Lorain County	1
## 1275	unknown Lynn County	1
## 1276	unknown Madison County	1
## 1277	unknown Marion County	1
## 1278	unknown McHenry County	1
## 1279	unknown Morton County	1
## 1280	unknown Murray County	1
## 1281	unknown Newton County	1
## 1282	unknown Niagara County	1
## 1283	unknown Nolan County	1
## 1284	unknown Nueces County	1
## 1285	unknown O'Brien County	1
## 1286	unknown Oldham County	1
## 1287	unknown Oneida County	1
## 1288	unknown Palo Alto County	1
## 1289	unknown Paulding County	1
## 1290	unknown Pennington County	1
## 1291	unknown Pennington County	2
## 1292	unknown Pipestone County	3
## 1293	unknown Pittsburg County	1
## 1294	unknown Pottawattamie County	1
## 1295	unknown Poweshiek County	1

## 1296	unknown Pratt County	1
## 1297	unknown Quay County	1
## 1298	unknown Randall County	1
## 1299	unknown Randolph County	1
## 1300	unknown Red Lake County	1
## 1301	unknown Red Willow County	1
## 1302	unknown San Gorgonio Pass	1
## 1303	unknown San Gorgonio Pass	4
## 1304	unknown San Gorgonio Pass	6
## 1305	unknown San Gorgonio Pass	7
## 1306	unknown San Miguel County	1
## 1307	unknown Scott County	1
## 1308	unknown Scotts Bluff County	1
## 1309	unknown Sioux County	1
## 1310	unknown Snohomish County	1
## 1311	unknown Solano County	1
## 1312	unknown Stillwater County	1
## 1313	unknown Suffolk County	1
## 1314	unknown Taylor County	1
## 1315	unknown Tehachapi Wind Resource Area	1
## 1316	unknown Tehachapi Wind Resource Area	3
## 1317	unknown Tulare County	1
## 1318	unknown Union County	1
## 1319	unknown Upton County	1
## 1320	unknown Washington County	1
## 1321	unknown Washoe County	1
## 1322	unknown Watonwan County	1
## 1323	unknown Whatcom County	1
## 1324	unknown Wyoming County	1
## 1325	unknown Yolo County	1
## 1326	unknown Young County	1
## 1327	unknown Young County	2
## 1328	unknown Yuma County	1
## 1329	Upper Scioto Valley School	1
## 1330	Valley City Wind Turbine	1
## 1331	Valley View	1
## 1332	Vansycle I	1
## 1333	Vansycle II	1
## 1334	Vantage Point	1
## 1335	Vasco (repower)	1
## 1336	Velva Wind Farm	1
## 1337	Victorville Wind Project	1
## 1338	Victory	1
## 1339	Vienna	1
## 1340	Vienna II	1
## 1341	Viking	1
## 1342	VPI Enterprises Inc.	1
## 1343	Wagner	1
## 1344	Wake	1
## 1345	Wall Lake Municipal Utilities	1
## 1346	Walmart Red Bluff	1
## 1347	Walnut Wind Project	1
## 1348	Wapsipinicon Wind	1
## 1349	Wausau High School	1

## 1350	Waverly III (Skeets 4)	1
## 1351	Waymart Wind Farm	1
## 1352	Weatherford Wind Energy Center	1
## 1353	Weatherford Wind Energy Center Expansion	1
## 1354	WED Coventry	1
## 1355	WED Coventry	2
## 1356	WED Coventry	3
## 1357	WED Coventry	4
## 1358	WED Coventry	5
## 1359	WED Coventry	6
## 1360	WED Portsmouth	1
## 1361	Wege Wind Farm	1
## 1362	Wellsburg	1
## 1363	Wessington Springs	1
## 1364	West Central School Corporation	1
## 1365	West Pipestone (Maiden Winds)	1
## 1366	West Texas Windplant	1
## 1367	Western Plains	1
## 1368	Westridge	1
## 1369	Westwind Association	1
## 1370	Wethersfield	1
## 1371	Wheatfield	1
## 1372	Whirlpool Corporation - Findlay Wind Farm	1
## 1373	Whirlpool Corporation - Marion Wind Farm	1
## 1374	Whirlpool Corporation - Ottawa Wind Farm	1
## 1375	Whirlwind Energy Center	1
## 1376	Whispering Willow I	1
## 1377	White Creek	1
## 1378	White Earth Tribe	1
## 1379	White Oak	1
## 1380	White Tail	1
## 1381	Whitewater Hill	1
## 1382	Wild Horse I	1
## 1383	Wild Horse II	1
## 1384	Wildcat I	1
## 1385	Wildcat Wind Project	1
## 1386	Wildorado	1
## 1387	Williams Stone	1
## 1388	Willmar	1
## 1389	Willow Creek	1
## 1390	Willow Spring	1
## 1391	Willow Springs Wind Farm	1
## 1392	Wilmont Hills	1
## 1393	Wilton Wind Energy Center II	1
## 1394	Winchester	1
## 1395	Wind Colebrook South	1
## 1396	Wind GEM	1
## 1397	Wind Vision	1
## 1398	Wind Walkers	1
## 1399	Windridge Wind Farm	1
## 1400	Windstar	1
## 1401	Windthorst-2	1
## 1402	Windy Point I (Tuolumne Wind Project)	1
## 1403	Windy Point II	1

```

## 1404           Windy Point Iia 1
## 1405 Windy Point IIa (Windy Flats Extension) 1
## 1406           Wing River Wind 1
## 1407           Winnebago I 1
## 1408           Winona 1
## 1409           Wintec Palm 1
## 1410           Wicta Wind 1
## 1411           Wolf 1
## 1412           Wolf Ridge 1
## 1413           Wolverine 1
## 1414 Wolverine Creek 1
## 1415 Woods Hole Research Center 1
## 1416           Woodstock 1
## 1417 Woodstock Municipal Wind 1
## 1418 Woodward Mountain I & II 1
## 1419 WPS Wind Farm (Casco) 1
## 1420 Wray School District 1
## 1421 Wynford Local Schools 1
## 1422 Yahoo Creek 1
## 1423 Zachary Ridge 1
## 1424 Zephyr Wind Project 1
## 1425           Zotos 1

```

lets explore the biggest project:

```

processed_data %>%
  filter(p_name == "San Gorgonio Farms Wind Farm") %>%
  arrange(p_year)

```

	case_id	faa_ors	faa_asn	usgs_pr_id	t_state	t_county
## 1	3008846	missing	missing	15323	CA	Riverside County
## 2	3067734	missing	missing	15376	CA	Riverside County
## 3	3009698	missing	missing	15335	CA	Riverside County
## 4	3003447	missing	missing	15377	CA	Riverside County
## 5	3002816	missing	missing	15380	CA	Riverside County
## 6	3067567	missing	missing	15375	CA	Riverside County
## 7	3006219	missing	missing	15373	CA	Riverside County
## 8	3010753	missing	missing	15322	CA	Riverside County
## 9	3067581	missing	missing	15321	CA	Riverside County
## 10	3067794	missing	missing	15324	CA	Riverside County
## 11	3074275	missing	missing	15379	CA	Riverside County
## 12	3011413	missing	missing	15378	CA	Riverside County
## 13	3002991	missing	missing	15218	CA	Riverside County
## 14	3073984	missing	missing	15219	CA	Riverside County
## 15	3067519	missing	missing	15328	CA	Riverside County
## 16	3004429	missing	missing	15334	CA	Riverside County
## 17	3009365	missing	missing	15316	CA	Riverside County
## 18	3067595	missing	missing	15374	CA	Riverside County
## 19	3007421	missing	missing	15315	CA	Riverside County
## 20	3067640	missing	missing	15325	CA	Riverside County
## 21	3008674	missing	missing	15372	CA	Riverside County
## 22	3067780	missing	missing	15326	CA	Riverside County
## 23	3067557	missing	missing	15169	CA	Riverside County
## 24	3071624	missing	missing	14783	CA	Riverside County

## 25	3071650	missing	missing	14808	CA Riverside County
## 26	3008590	missing	missing	14776	CA Riverside County
## 27	3071651	missing	missing	14809	CA Riverside County
## 28	3002090	missing	missing	14791	CA Riverside County
## 29	3071667	missing	missing	14772	CA Riverside County
## 30	3007793	missing	missing	14800	CA Riverside County
## 31	3000489	missing	missing	14796	CA Riverside County
## 32	3067715	missing	missing	14822	CA Riverside County
## 33	3067514	missing	missing	14803	CA Riverside County
## 34	3005771	missing	missing	14792	CA Riverside County
## 35	3005886	missing	missing	14781	CA Riverside County
## 36	3071638	missing	missing	14787	CA Riverside County
## 37	3071652	missing	missing	14778	CA Riverside County
## 38	3071662	missing	missing	14789	CA Riverside County
## 39	3071623	missing	missing	14798	CA Riverside County
## 40	3000613	missing	missing	14811	CA Riverside County
## 41	3071659	missing	missing	14775	CA Riverside County
## 42	3071641	missing	missing	14786	CA Riverside County
## 43	3006943	missing	missing	14799	CA Riverside County
## 44	3067604	missing	missing	14802	CA Riverside County
## 45	3071625	missing	missing	14790	CA Riverside County
## 46	3085846	missing	missing	-9999	CA Riverside County
## 47	3071658	missing	missing	14807	CA Riverside County
## 48	3067495	missing	missing	14821	CA Riverside County
## 49	3071630	missing	missing	14780	CA Riverside County
## 50	3067714	missing	missing	14820	CA Riverside County
## 51	3067748	missing	missing	14805	CA Riverside County
## 52	3067773	missing	missing	14815	CA Riverside County
## 53	3067532	missing	missing	14824	CA Riverside County
## 54	3004746	missing	missing	14794	CA Riverside County
## 55	3005750	missing	missing	14801	CA Riverside County
## 56	3071647	missing	missing	14774	CA Riverside County
## 57	3071664	missing	missing	14770	CA Riverside County
## 58	3071634	missing	missing	14785	CA Riverside County
## 59	3071640	missing	missing	14784	CA Riverside County
## 60	3071642	missing	missing	14810	CA Riverside County
## 61	3071656	missing	missing	14806	CA Riverside County
## 62	3071649	missing	missing	14771	CA Riverside County
## 63	3071660	missing	missing	14797	CA Riverside County
## 64	3067863	missing	missing	14818	CA Riverside County
## 65	3009215	missing	missing	14793	CA Riverside County
## 66	3009639	missing	missing	14795	CA Riverside County
## 67	3071636	missing	missing	14788	CA Riverside County
## 68	3071635	missing	missing	14782	CA Riverside County
## 69	3071657	missing	missing	14812	CA Riverside County
## 70	3067612	missing	missing	14814	CA Riverside County
## 71	3067503	missing	missing	14817	CA Riverside County
## 72	3067523	missing	missing	14804	CA Riverside County
## 73	3067554	missing	missing	14819	CA Riverside County
## 74	3067654	missing	missing	14816	CA Riverside County
## 75	3067823	missing	missing	14823	CA Riverside County
## 76	3071654	missing	missing	14773	CA Riverside County
## 77	3071655	missing	missing	14779	CA Riverside County
## 78	3009014	missing	missing	15167	CA Riverside County

## 79	3067809	missing	missing	15310	CA Riverside County	
## 80	3009328	missing	missing	15172	CA Riverside County	
## 81	3001393	missing	missing	15170	CA Riverside County	
## 82	3007447	missing	missing	15171	CA Riverside County	
## 83	3010497	missing	missing	15234	CA Riverside County	
## 84	3074253	missing	missing	15393	CA Riverside County	
## 85	3003407	missing	missing	15165	CA Riverside County	
## 86	3010951	missing	missing	15307	CA Riverside County	
## 87	3004719	missing	missing	15317	CA Riverside County	
## 88	3000086	missing	missing	15221	CA Riverside County	
## 89	3067590	missing	missing	15163	CA Riverside County	
## 90	3009537	missing	missing	15225	CA Riverside County	
## 91	3067533	missing	missing	15341	CA Riverside County	
## 92	3074256	missing	missing	15392	CA Riverside County	
## 93	3074277	missing	missing	15339	CA Riverside County	
## 94	3036596	06-021555	2010-WTW-17401-0E	16318	CA Riverside County	
## 95	3036595	06-021581	2010-WTW-17400-0E	16317	CA Riverside County	
## 96	3002930	missing	missing	15164	CA Riverside County	
## 97	3073997	missing	missing	15233	CA Riverside County	
## 98	3073990	missing	missing	15185	CA Riverside County	
## 99	3000974	missing	missing	15340	CA Riverside County	
## 100	3073992	missing	missing	15237	CA Riverside County	
## 101	3007758	missing	missing	15235	CA Riverside County	
## 102	3009974	missing	missing	15329	CA Riverside County	
## 103	3000197	missing	missing	15337	CA Riverside County	
## 104	3009000	missing	missing	15342	CA Riverside County	
## 105	3010606	missing	missing	15168	CA Riverside County	
## 106	3008915	missing	missing	15166	CA Riverside County	
## 107	3067502	missing	missing	15162	CA Riverside County	
## 108	3006500	missing	missing	15357	CA Riverside County	
## 109	3067669	missing	missing	15158	CA Riverside County	
## 110	3073994	missing	missing	15236	CA Riverside County	
## 111	3073986	missing	missing	15184	CA Riverside County	
## 112	3085845	missing	missing	-9999	CA Riverside County	
## 113	3073995	missing	missing	15227	CA Riverside County	
## 114	3006652	missing	missing	15223	CA Riverside County	
##	t_fips		p_name	p_year	p_tnum p_cap t_manu t_model	
## 1	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 2	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 3	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 4	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 5	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 6	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 7	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 8	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 9	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 10	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 11	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 12	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 13	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 14	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 15	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 16	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65
## 17	6065	San Gorgonio Farms Wind Farm		1984	112 31.00 Bonus	65

## 72	6065	San Gorgonio Farms Wind Farm	1986	112	31.00	Bonus	120	
## 73	6065	San Gorgonio Farms Wind Farm	1986	112	31.00	Bonus	120	
## 74	6065	San Gorgonio Farms Wind Farm	1986	112	31.00	Bonus	120	
## 75	6065	San Gorgonio Farms Wind Farm	1986	112	31.00	Bonus	120	
## 76	6065	San Gorgonio Farms Wind Farm	1986	112	31.00	Bonus	120	
## 77	6065	San Gorgonio Farms Wind Farm	1986	112	31.00	Bonus	120	
## 78	6065	San Gorgonio Farms Wind Farm	1990	166	31.00	DWT	V34	
## 79	6065	San Gorgonio Farms Wind Farm	1992	112	31.00	Vestas	V39	
## 80	6065	San Gorgonio Farms Wind Farm	1994	112	31.00	Vestas	V39	
## 81	6065	San Gorgonio Farms Wind Farm	1994	112	31.00	Vestas	V39	
## 82	6065	San Gorgonio Farms Wind Farm	1994	112	31.00	Vestas	V39	
## 83	6065	San Gorgonio Farms Wind Farm	1994	112	31.00	Vestas	V39	
## 84	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 85	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 86	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 87	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 88	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 89	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 90	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 91	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 92	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 93	6065	San Gorgonio Farms Wind Farm	2008	112	31.00	Vestas	V39	
## 94	6065	San Gorgonio Farms Wind Farm	2011	112	31.00	Vestas	V90-3.0	
## 95	6065	San Gorgonio Farms Wind Farm	2011	112	31.00	Vestas	V90-3.0	
## 96	6065	San Gorgonio Farms Wind Farm	2014	112	31.00	Vestas	V42	
## 97	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V39	
## 98	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V44	
## 99	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V44	
## 100	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V39	
## 101	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V44	
## 102	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V44	
## 103	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V44	
## 104	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V44	
## 105	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V44	
## 106	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V42	
## 107	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V42	
## 108	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V44	
## 109	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V42	
## 110	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V39	
## 111	6065	San Gorgonio Farms Wind Farm	2015	112	31.00	Vestas	V44	
## 112	6065	San Gorgonio Farms Wind Farm	2016	112	31.00	Vestas	V42	
## 113	6065	San Gorgonio Farms Wind Farm	2016	112	31.00	Vestas	V42	
## 114	6065	San Gorgonio Farms Wind Farm	2016	112	31.00	Vestas	V42	
##	t_cap	t_hh	t_rd	t_rsa	t_ttlh	t_conf_atr	t_conf_loc	t_img_date
## 1	65	24	15.3	183.85	32.0	3	3	10/15/2017
## 2	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 3	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 4	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 5	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 6	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 7	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 8	65	24	15.3	183.85	32.0	3	3	10/15/2017
## 9	65	24	15.3	183.85	32.0	3	3	10/15/2017
## 10	65	24	15.3	183.85	32.0	3	3	10/15/2017

## 11	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 12	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 13	65	24	15.3	183.85	32.0	3	3	10/15/2017
## 14	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 15	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 16	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 17	65	24	15.3	183.85	32.0	3	3	10/15/2017
## 18	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 19	60	-9999	-9999.0	-9999.00	-9999.0	2	3	10/15/2017
## 20	65	24	15.3	183.85	32.0	3	3	10/15/2017
## 21	65	24	15.3	183.85	32.0	2	3	10/15/2017
## 22	65	-9999	-9999.0	-9999.00	-9999.0	2	3	10/15/2017
## 23	120	-9999	19.4	295.59	-9999.0	2	3	10/15/2017
## 24	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 25	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 26	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 27	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 28	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 29	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 30	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 31	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 32	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 33	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 34	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 35	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 36	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 37	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 38	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 39	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 40	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 41	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 42	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 43	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 44	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 45	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 46	120	24	19.4	295.59	34.0	1	3	10/15/2017
## 47	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 48	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 49	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 50	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 51	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 52	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 53	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 54	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 55	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 56	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 57	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 58	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 59	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 60	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 61	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 62	120	24	19.4	295.59	34.0	2	3	7/28/2017
## 63	120	24	19.4	295.59	34.0	2	3	10/15/2017
## 64	120	24	19.4	295.59	34.0	2	3	10/15/2017

```

## 65 120 24 19.4 295.59 34.0 2 3 7/28/2017
## 66 120 24 19.4 295.59 34.0 2 3 7/28/2017
## 67 120 24 19.4 295.59 34.0 2 3 7/28/2017
## 68 120 24 19.4 295.59 34.0 2 3 7/28/2017
## 69 120 24 19.4 295.59 34.0 2 3 10/15/2017
## 70 120 24 19.4 295.59 34.0 2 3 10/15/2017
## 71 120 24 19.4 295.59 34.0 2 3 10/15/2017
## 72 120 24 19.4 295.59 34.0 2 3 10/15/2017
## 73 120 24 19.4 295.59 34.0 2 3 10/15/2017
## 74 120 24 19.4 295.59 34.0 2 3 10/15/2017
## 75 120 24 19.4 295.59 34.0 2 3 10/15/2017
## 76 120 24 19.4 295.59 34.0 2 3 7/28/2017
## 77 120 24 19.4 295.59 34.0 2 3 7/28/2017
## 78 350 -9999 -9999.0 -9999.00 -9999.0 2 3 10/15/2017
## 79 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 80 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 81 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 82 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 83 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 84 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 85 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 86 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 87 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 88 500 30 39.0 1194.59 51.0 2 3 10/15/2017
## 89 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 90 500 30 39.0 1194.59 51.0 2 3 10/15/2017
## 91 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 92 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 93 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 94 3000 80 90.0 6361.73 125.0 3 3 missing
## 95 3000 80 90.0 6361.73 125.0 2 3 missing
## 96 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 97 500 40 42.0 1194.59 60.9 2 3 10/15/2017
## 98 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 99 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 100 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 101 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 102 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 103 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 104 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 105 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 106 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 107 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 108 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 109 500 40 39.0 1194.59 60.9 2 3 10/15/2017
## 110 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 111 500 40 42.0 1385.44 60.9 2 3 10/15/2017
## 112 500 40 39.0 1194.59 60.9 1 3 10/15/2017
## 113 500 30 42.0 1385.44 51.0 2 3 10/15/2017
## 114 500 30 39.0 1194.59 51.0 1 3 10/15/2017
## t_img_srce xlong ylat
## 1 Digital Globe -116.6177 33.92505
## 2 Digital Globe -116.6203 33.92049
## 3 Digital Globe -116.6165 33.92099

```

```
## 4  Digital Globe -116.6203 33.92030
## 5  Digital Globe -116.6202 33.91975
## 6  Digital Globe -116.6203 33.92064
## 7  Digital Globe -116.6203 33.92100
## 8  Digital Globe -116.6177 33.92490
## 9  Digital Globe -116.6177 33.92422
## 10 Digital Globe -116.6177 33.92523
## 11 Digital Globe -116.6202 33.91993
## 12 Digital Globe -116.6203 33.92012
## 13 Digital Globe -116.6296 33.92250
## 14 Digital Globe -116.6296 33.92234
## 15 Digital Globe -116.6165 33.92225
## 16 Digital Globe -116.6165 33.92118
## 17 Digital Globe -116.6161 33.92368
## 18 Digital Globe -116.6203 33.92083
## 19 Digital Globe -116.6161 33.92386
## 20 Digital Globe -116.6177 33.92541
## 21 Digital Globe -116.6203 33.92120
## 22 Digital Globe -116.6176 33.92583
## 23 Digital Globe -116.6250 33.92835
## 24 Digital Globe -116.6117 33.92653
## 25 Digital Globe -116.6132 33.93149
## 26 Digital Globe -116.6118 33.92789
## 27 Digital Globe -116.6132 33.93131
## 28 Digital Globe -116.6133 33.92767
## 29 Digital Globe -116.6117 33.92866
## 30 Digital Globe -116.6132 33.92590
## 31 Digital Globe -116.6132 33.92670
## 32 Digital Globe -116.6147 33.93013
## 33 Digital Globe -116.6147 33.92721
## 34 Digital Globe -116.6132 33.92749
## 35 Digital Globe -116.6117 33.92690
## 36 Digital Globe -116.6117 33.92578
## 37 Digital Globe -116.6117 33.92751
## 38 Digital Globe -116.6132 33.92803
## 39 Digital Globe -116.6132 33.92628
## 40 Digital Globe -116.6132 33.93090
## 41 Digital Globe -116.6117 33.92809
## 42 Digital Globe -116.6117 33.92597
## 43 Digital Globe -116.6132 33.92609
## 44 Digital Globe -116.6147 33.92740
## 45 Digital Globe -116.6133 33.92787
## 46 Digital Globe -116.6132 33.93072
## 47 Digital Globe -116.6118 33.93132
## 48 Digital Globe -116.6148 33.93033
## 49 Digital Globe -116.6117 33.92712
## 50 Digital Globe -116.6147 33.93050
## 51 Digital Globe -116.6147 33.92682
## 52 Digital Globe -116.6147 33.93149
## 53 Digital Globe -116.6147 33.92973
## 54 Digital Globe -116.6132 33.92709
## 55 Digital Globe -116.6132 33.92569
## 56 Digital Globe -116.6117 33.92829
## 57 Digital Globe -116.6117 33.92905
```

```
## 58 Digital Globe -116.6117 33.92615
## 59 Digital Globe -116.6117 33.92636
## 60 Digital Globe -116.6133 33.93115
## 61 Digital Globe -116.6118 33.93152
## 62 Digital Globe -116.6117 33.92884
## 63 Digital Globe -116.6132 33.92648
## 64 Digital Globe -116.6147 33.93087
## 65 Digital Globe -116.6132 33.92730
## 66 Digital Globe -116.6132 33.92690
## 67 Digital Globe -116.6132 33.92826
## 68 Digital Globe -116.6117 33.92674
## 69 Digital Globe -116.6132 33.93053
## 70 Digital Globe -116.6148 33.93167
## 71 Digital Globe -116.6147 33.93108
## 72 Digital Globe -116.6147 33.92701
## 73 Digital Globe -116.6147 33.93072
## 74 Digital Globe -116.6147 33.93129
## 75 Digital Globe -116.6147 33.92991
## 76 Digital Globe -116.6117 33.92845
## 77 Digital Globe -116.6117 33.92730
## 78 Digital Globe -116.6250 33.92910
## 79 Digital Globe -116.6156 33.92384
## 80 Digital Globe -116.6250 33.92724
## 81 Digital Globe -116.6250 33.92799
## 82 Digital Globe -116.6250 33.92759
## 83 Digital Globe -116.6303 33.92850
## 84 Digital Globe -116.6223 33.91984
## 85 Digital Globe -116.6249 33.93003
## 86 Digital Globe -116.6159 33.92630
## 87 Digital Globe -116.6157 33.92339
## 88 Digital Globe -116.6301 33.92334
## 89 Digital Globe -116.6249 33.93076
## 90 Digital Globe -116.6303 33.92410
## 91 Digital Globe -116.6192 33.92041
## 92 Digital Globe -116.6221 33.92024
## 93 Digital Globe -116.6192 33.91960
## 94 Digital Globe -116.6105 33.92440
## 95 Digital Globe -116.6105 33.92540
## 96 Digital Globe -116.6249 33.93040
## 97 Digital Globe -116.6303 33.92893
## 98 Digital Globe -116.6260 33.92343
## 99 Digital Globe -116.6193 33.91999
## 100 Digital Globe -116.6304 33.92723
## 101 Digital Globe -116.6303 33.92807
## 102 Digital Globe -116.6160 33.92210
## 103 Digital Globe -116.6166 33.91999
## 104 Digital Globe -116.6192 33.92079
## 105 Digital Globe -116.6250 33.92870
## 106 Digital Globe -116.6250 33.92944
## 107 Digital Globe -116.6249 33.93112
## 108 Digital Globe -116.6197 33.92419
## 109 Digital Globe -116.6218 33.93160
## 110 Digital Globe -116.6303 33.92767
## 111 Digital Globe -116.6260 33.92404
```

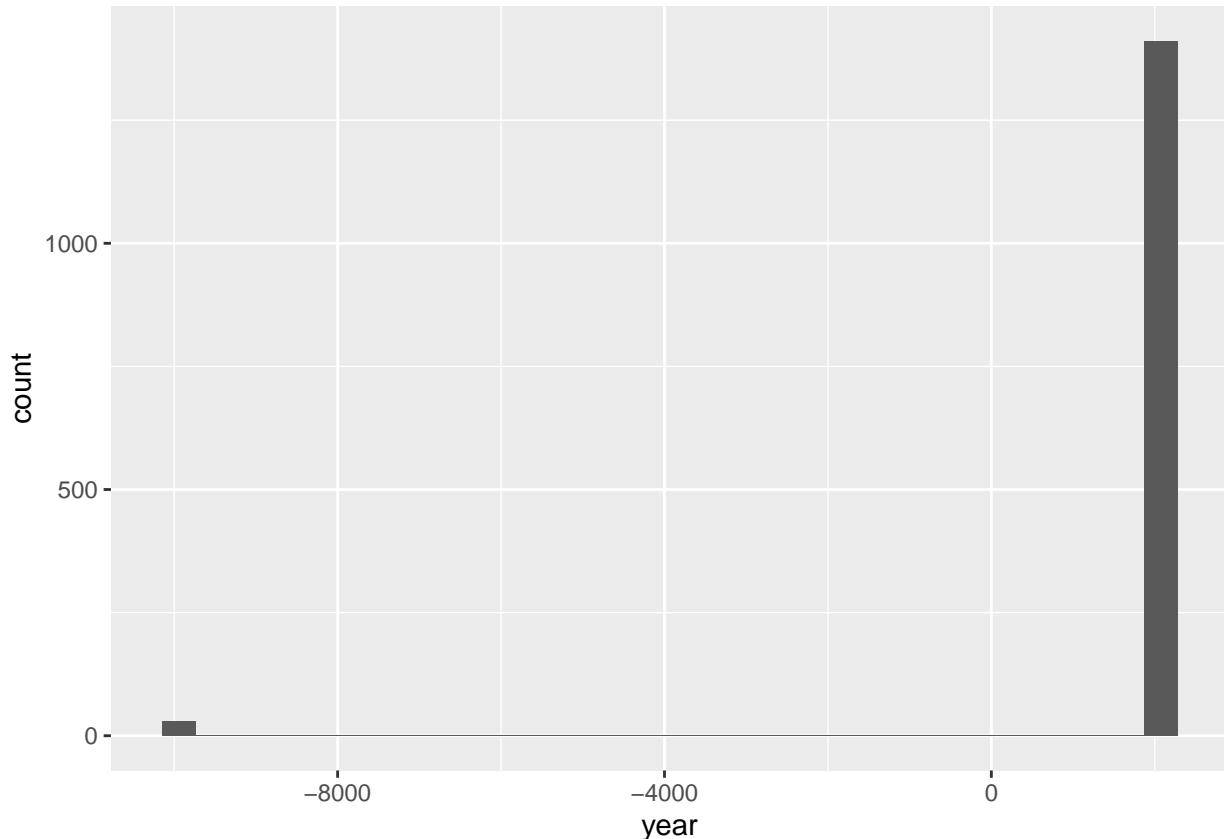
```
## 112 Digital Globe -116.6218 33.93125
## 113 Digital Globe -116.6305 33.92484
## 114 Digital Globe -116.6305 33.92263
```

```
projects <- processed_data %>%
  group_by(p_name, t_state) %>%
  summarise(year = min(p_year),
            turbines = n(),
            lon = mean(xlong),
            lat = mean(ylat),
            lon_sd = sd(xlong),
            lat_sd = sd(ylat))
```

```
## `summarise()` has grouped output by 'p_name'. You can override using the
## '.groups' argument.
```

```
projects %>%
  ggplot(aes(year)) +
  geom_histogram()
```

```
## `stat_bin()` using 'bins = 30'. Pick better value with 'binwidth'.
```



```

processed_by_year_data <- us_wind %>%
  filter(!t_state %in% c("AK", "HI", "GU", "PR")) %>%
  mutate(p_year = ifelse(p_year < -8000, NA, p_year),
        t_cap = ifelse(t_cap < 0, NA, t_cap))

projects_by_year <- processed_by_year_data %>%
  group_by(p_name, t_state) %>%
  summarise(year = min(p_year),
            turbines = n(),
            lon = mean(xlong),
            lat = mean(ylat),
            lon_sd = sd(xlong),
            lat_sd = sd(ylat))

```

‘summarise()’ has grouped output by ‘p_name’. You can override using the
‘.groups’ argument.

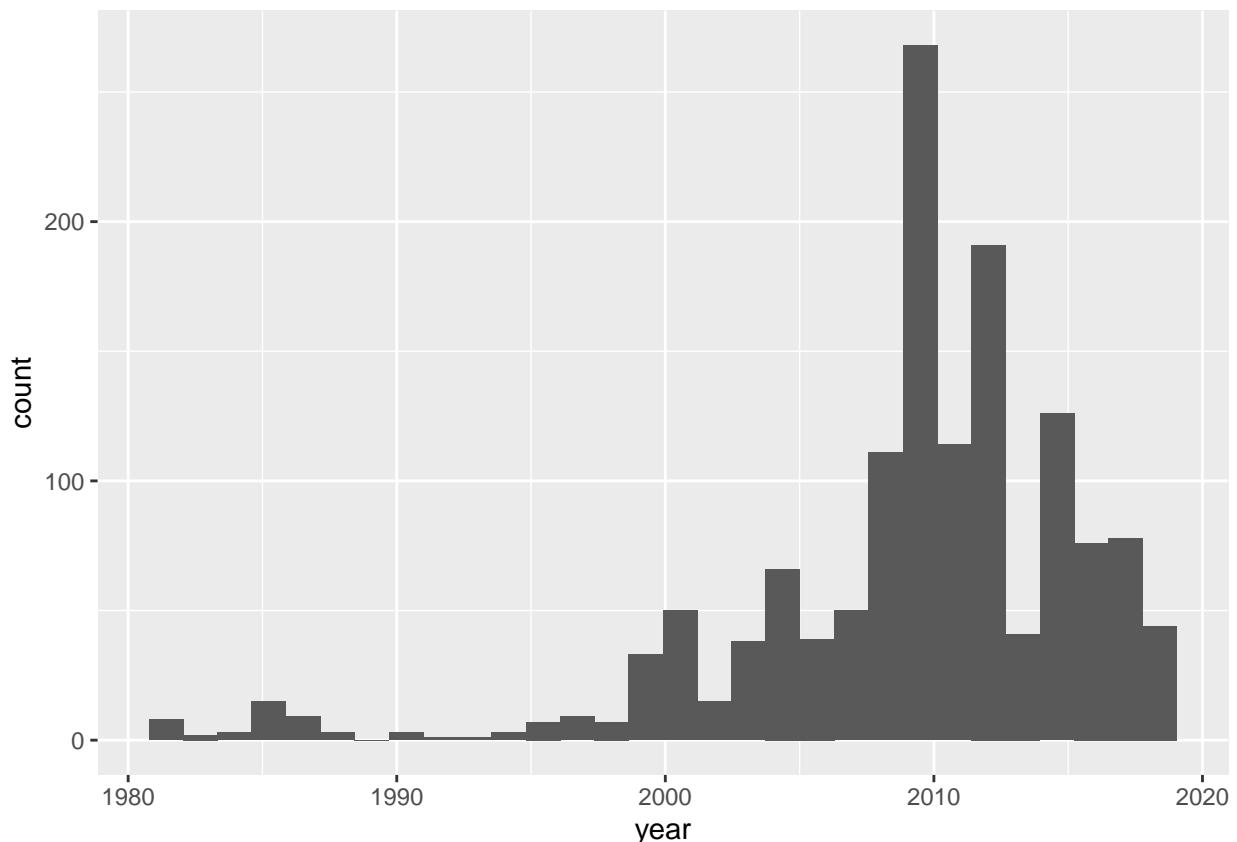
```

projects_by_year %>%
  ggplot(aes(year)) +
  geom_histogram()

```

‘stat_bin()’ using ‘bins = 30’. Pick better value with ‘binwidth’.

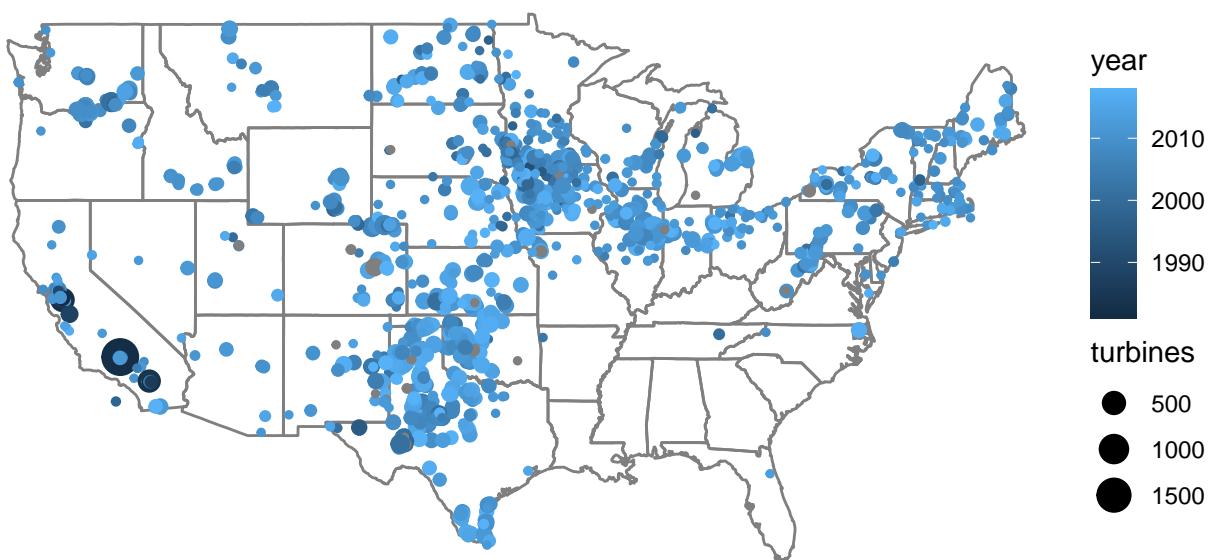
Warning: Removed 29 rows containing non-finite values (stat_bin).



```

projects_by_year %>%
  ggplot(aes(lon, lat, size = turbines, color = year)) +
  borders("state") +
  geom_point() +
  coord_map() +
  theme_void()

```



```

projects_by_year <- processed_by_year_data %>%
  group_by(p_name, t_state) %>%
  summarise(year = min(p_year),
            turbines = n(),
            total_capacity = sum(t_cap),
            lon = mean(xlong),
            lat = mean(ylat),
            lon_sd = sd(xlong),
            lat_sd = sd(ylat))

```

```

## `summarise()` has grouped output by 'p_name'. You can override using the
## `.` argument.

```

```

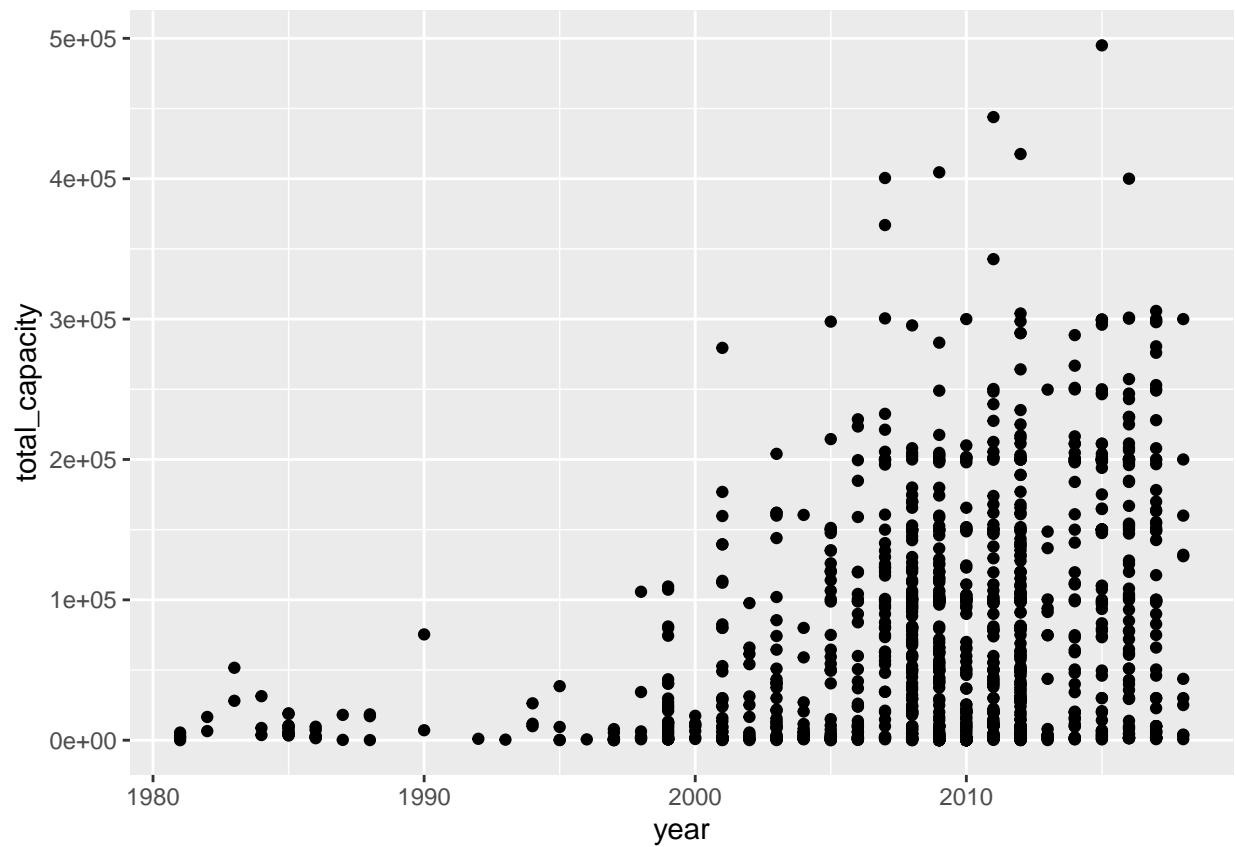
projects_by_year %>%
  ggplot(aes(year, total_capacity)) +
  geom_point()

```

```

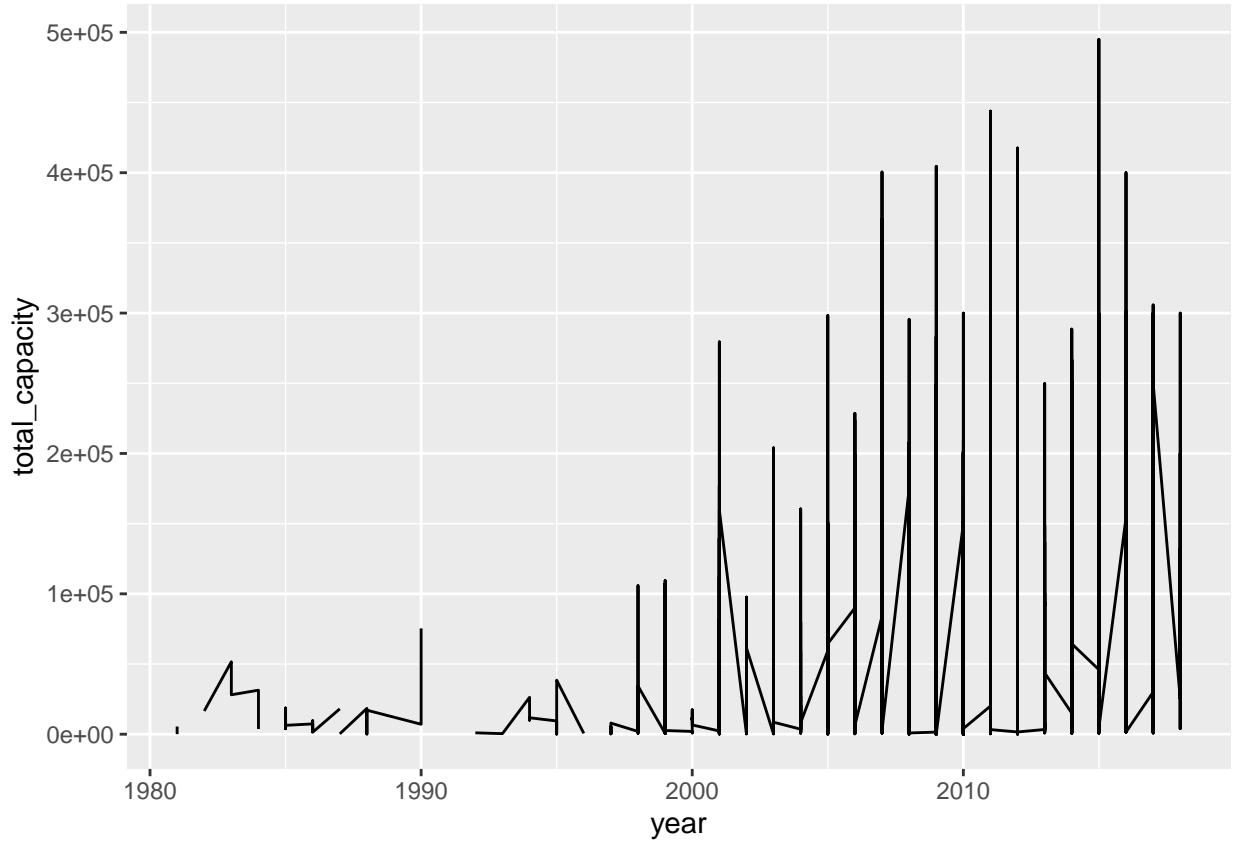
## Warning: Removed 171 rows containing missing values (geom_point).

```



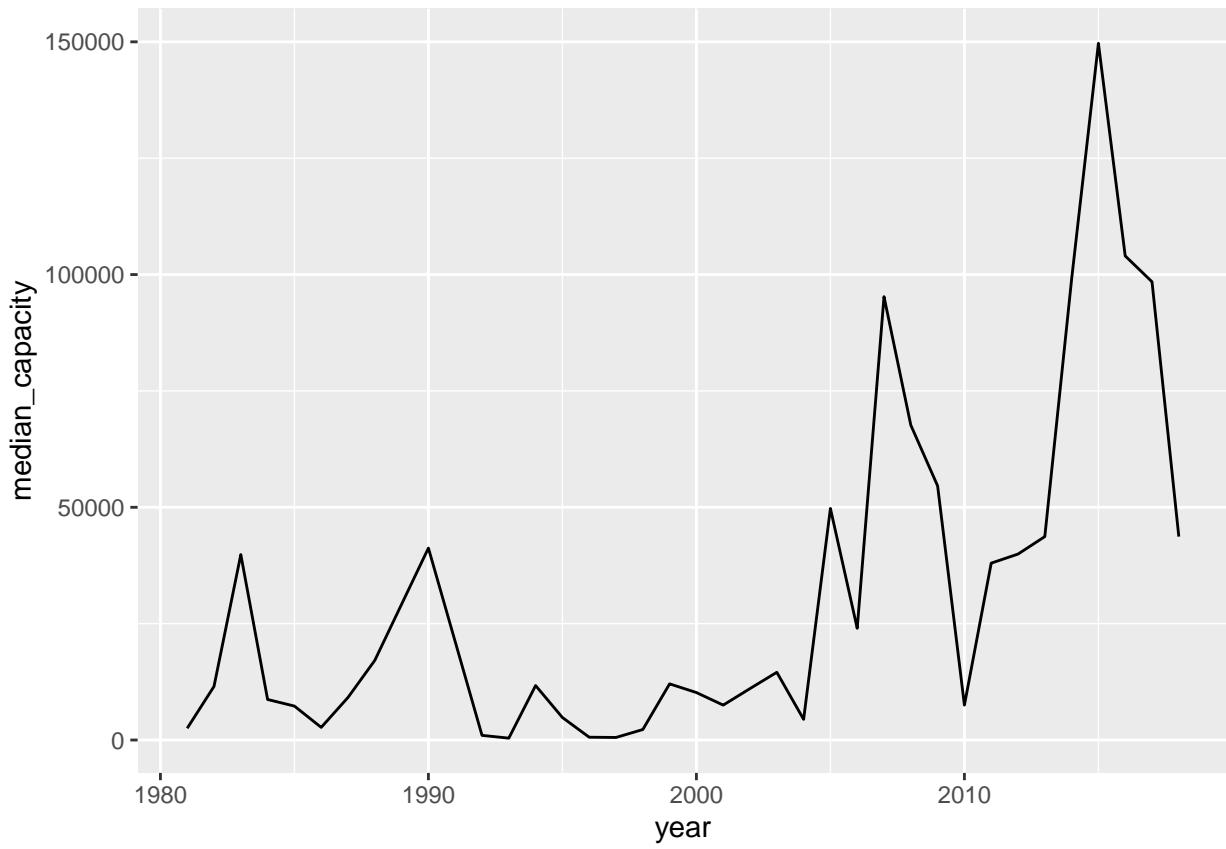
```
projects_by_year %>%
  ggplot(aes(year, total_capacity)) +
  geom_line()
```

```
## Warning: Removed 29 row(s) containing missing values (geom_path).
```



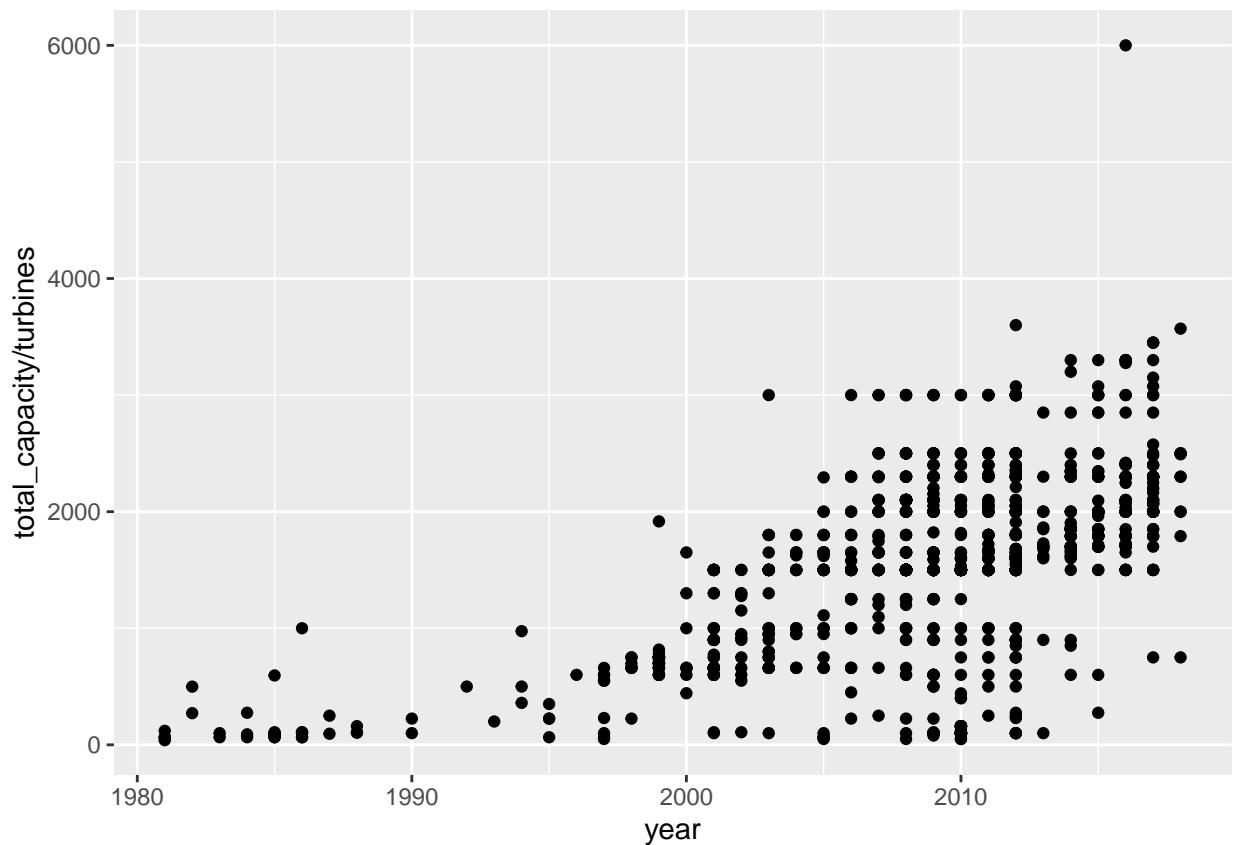
```
projects_by_year %>%
  group_by(year) %>%
  summarise(median_capacity = median(total_capacity, na.rm = TRUE),
            projects = n()) %>%
  arrange(year) %>%
  view() %>%
  ggplot(aes(year, median_capacity)) +
  geom_line()
```

```
## Warning: Removed 1 row(s) containing missing values (geom_path).
```



```
projects_by_year %>%
  ggplot(aes(year, total_capacity/turbines)) +
  geom_point()
```

```
## Warning: Removed 171 rows containing missing values (geom_point).
```



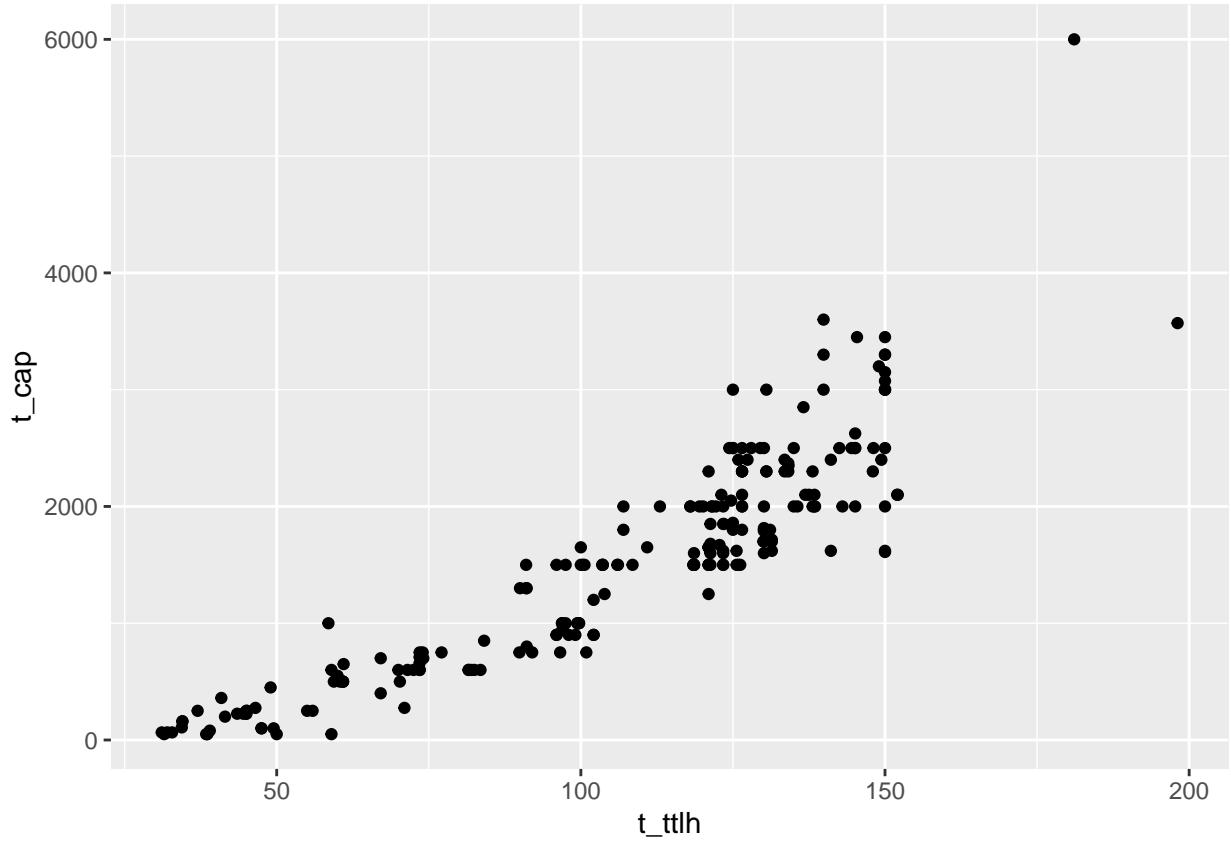
```

trubine_models <- processed_data %>%
  mutate_if(is.numeric, ~ifelse(. == -9999, NA, .)) %>%
  group_by(t_model) %>%
  summarise(t_cap = median(t_cap),
            t_hh = median(t_hh),
            t_rd = median(t_rd),
            t_rsa = median(t_rsa),
            t_ttlh = median(t_ttlh),
            turbines = n(),
            projects = n_distinct(p_name)) %>%
  arrange(desc(projects))

# total height effects capacity:
trubine_models %>%
  ggplot(aes(t_ttlh, t_cap)) +
  geom_point()

```

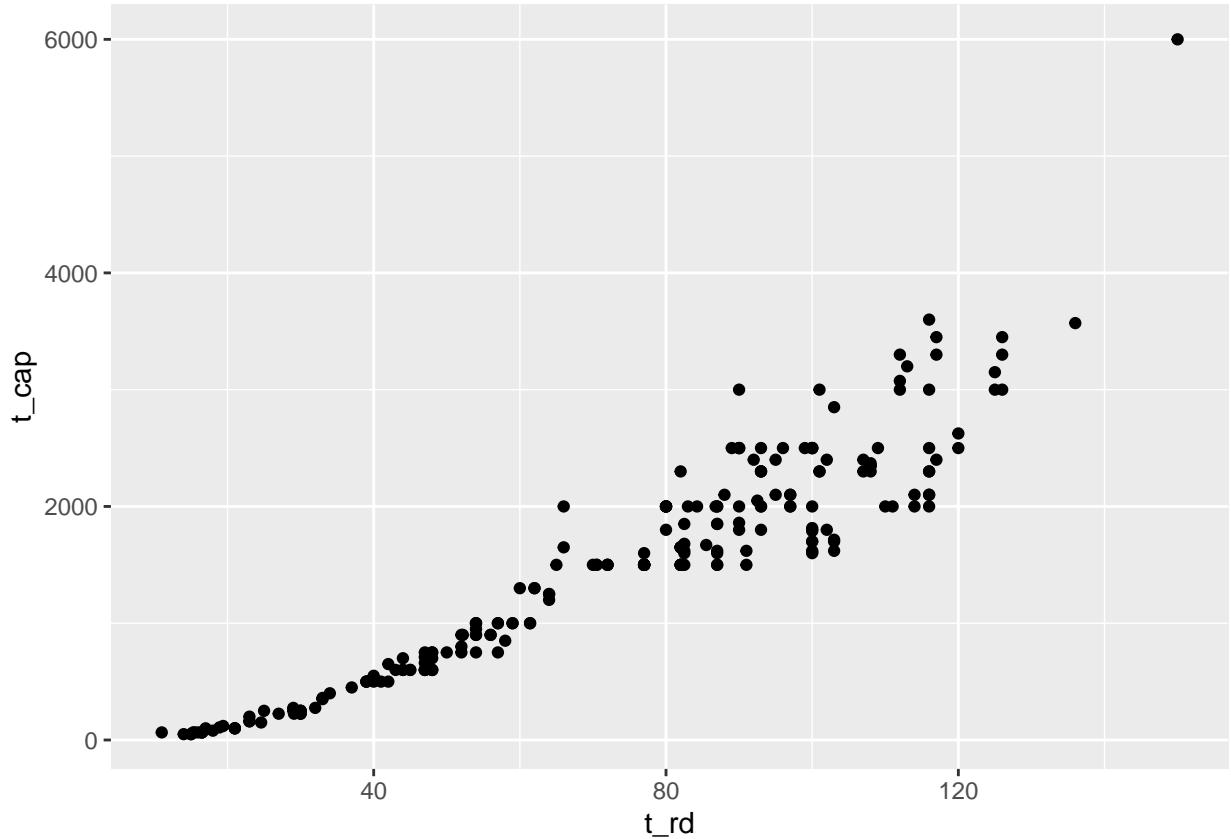
Warning: Removed 33 rows containing missing values (geom_point).



```
# rotor swept area effects capacity:
```

```
trubine_models %>%
  ggplot(aes(t_rd, t_cap)) +
  geom_point()
```

```
## Warning: Removed 26 rows containing missing values (geom_point).
```



```

library(gganimate)

projects_by_year %>%
  ggplot(aes(lon, lat, size = turbines, color = year)) +
  borders("state") +
  geom_point() +
  transition_states(
    year,
    transition_length = 2,
    state_length = 1
  ) +
  coord_map() +
  theme_void()

## Warning in lapply(row_vars$states, as.integer): NAs introduced by coercion

## Warning in f(..., self = self): NAs introduced by coercion

```



























































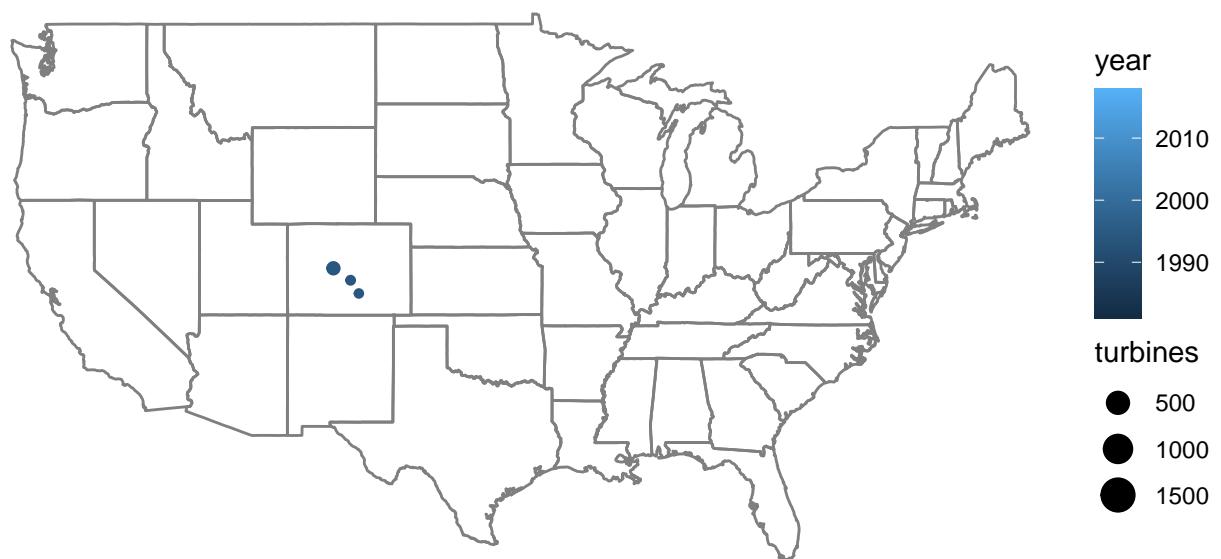


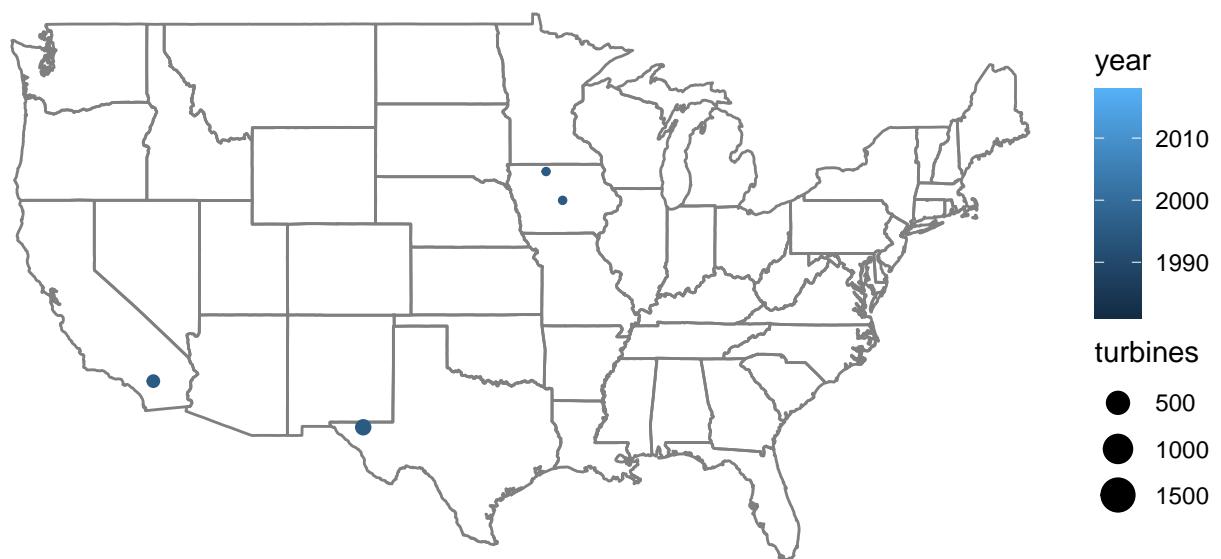




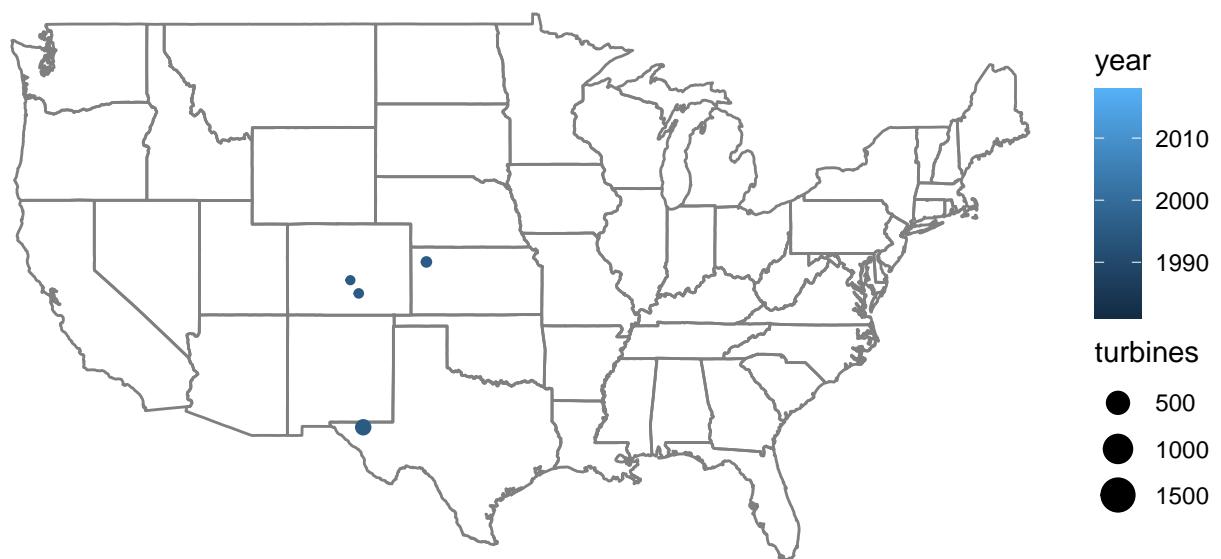












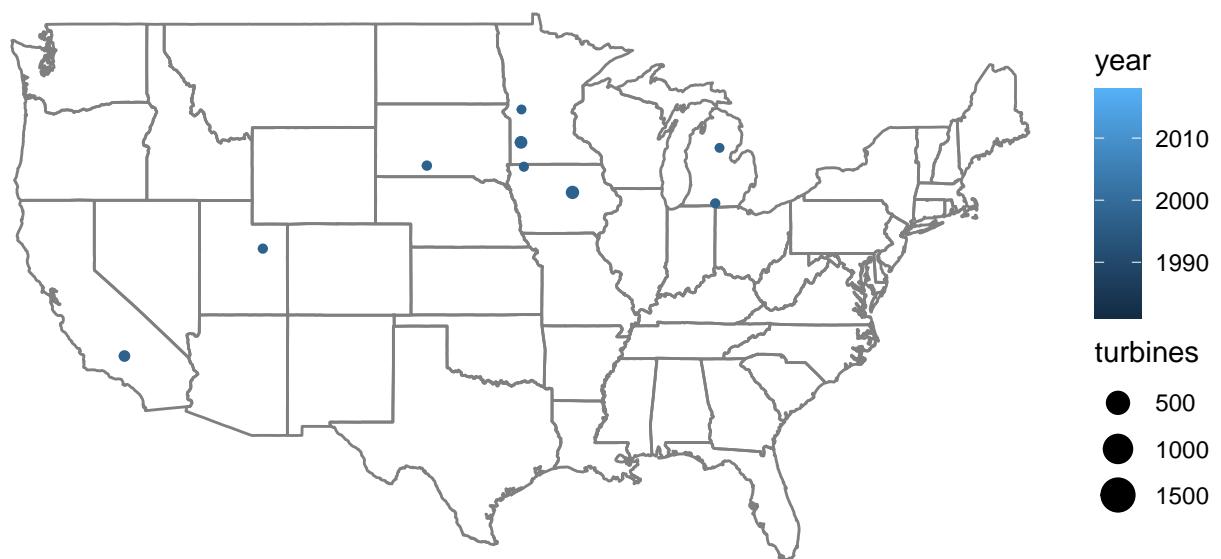






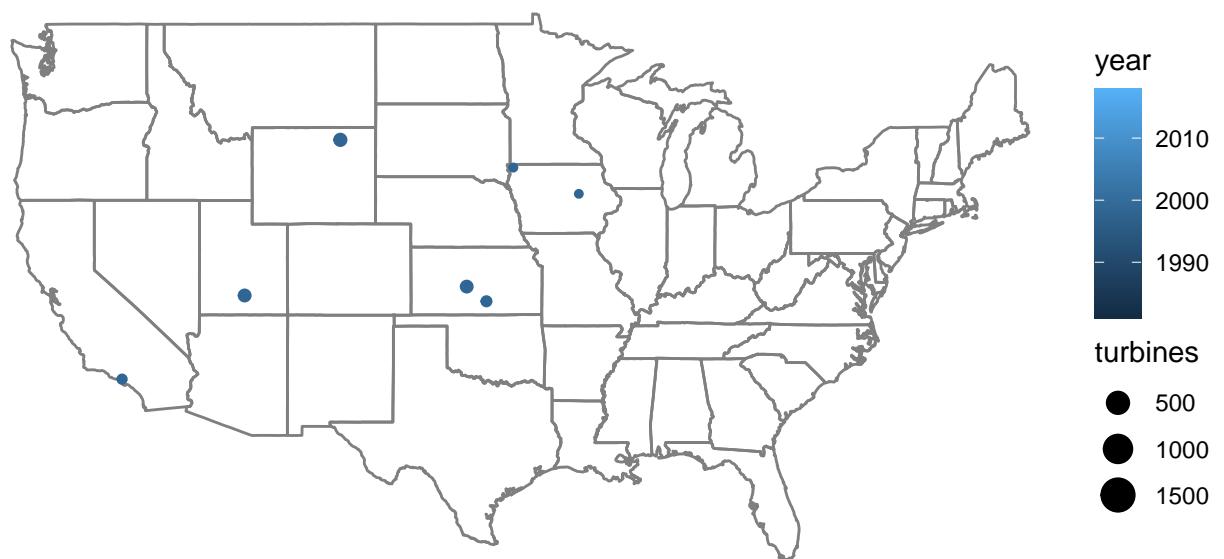


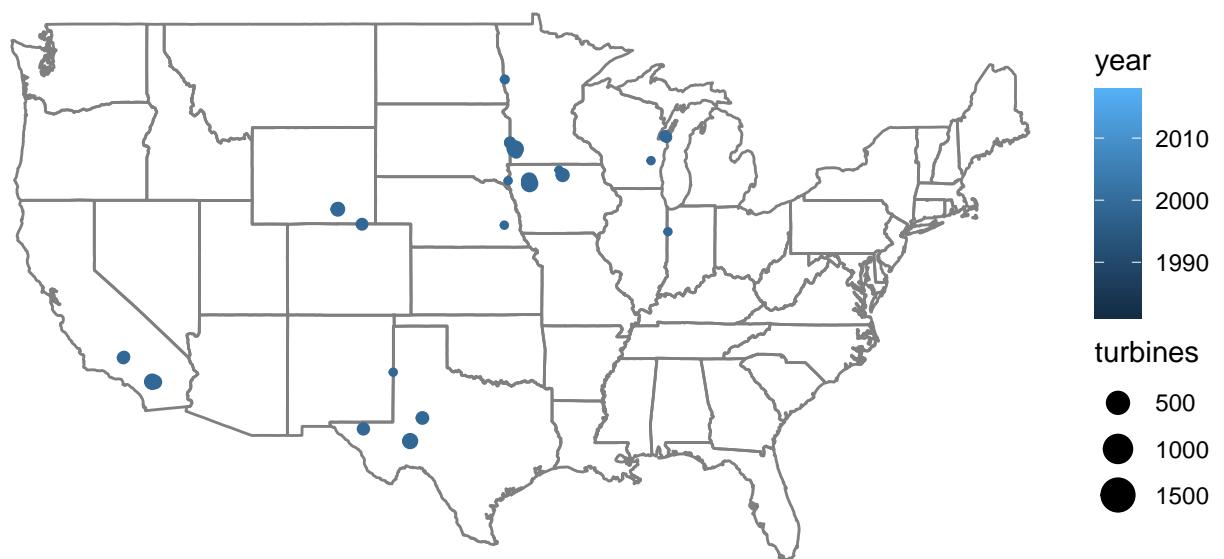


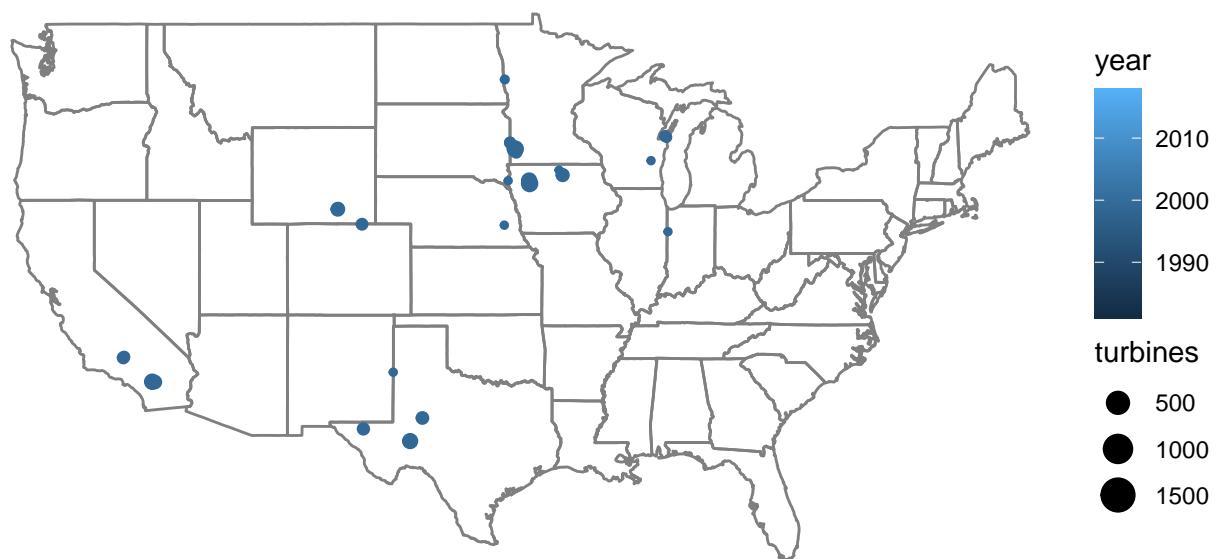


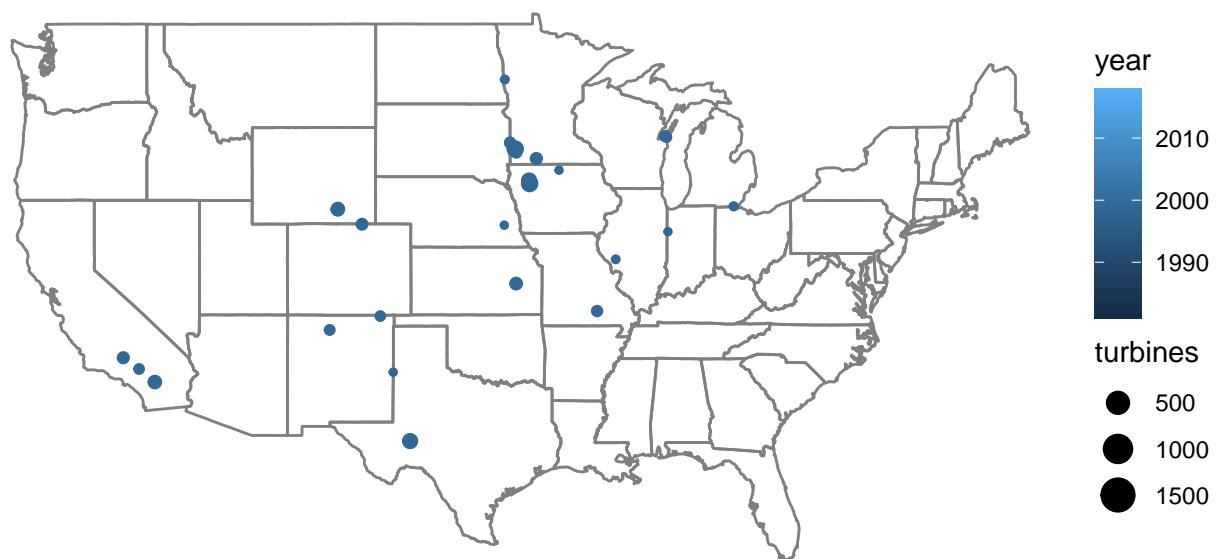




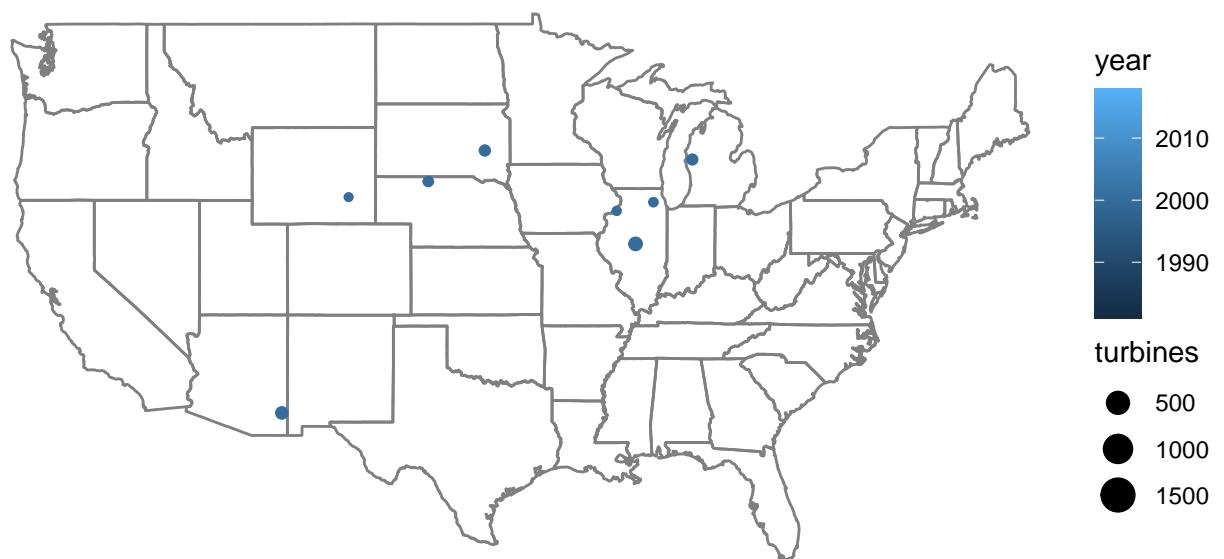


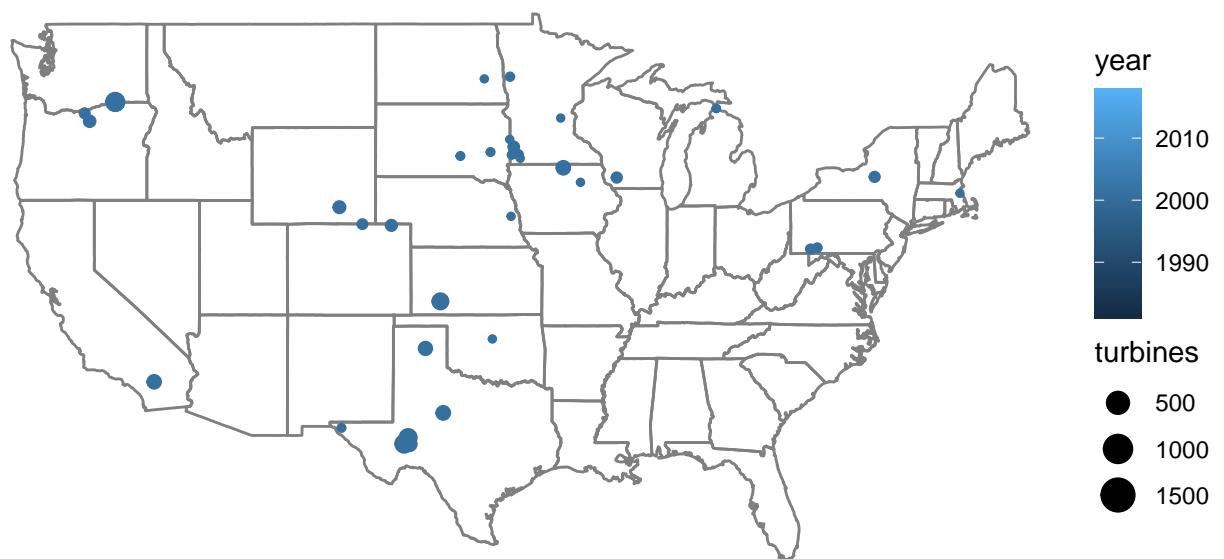


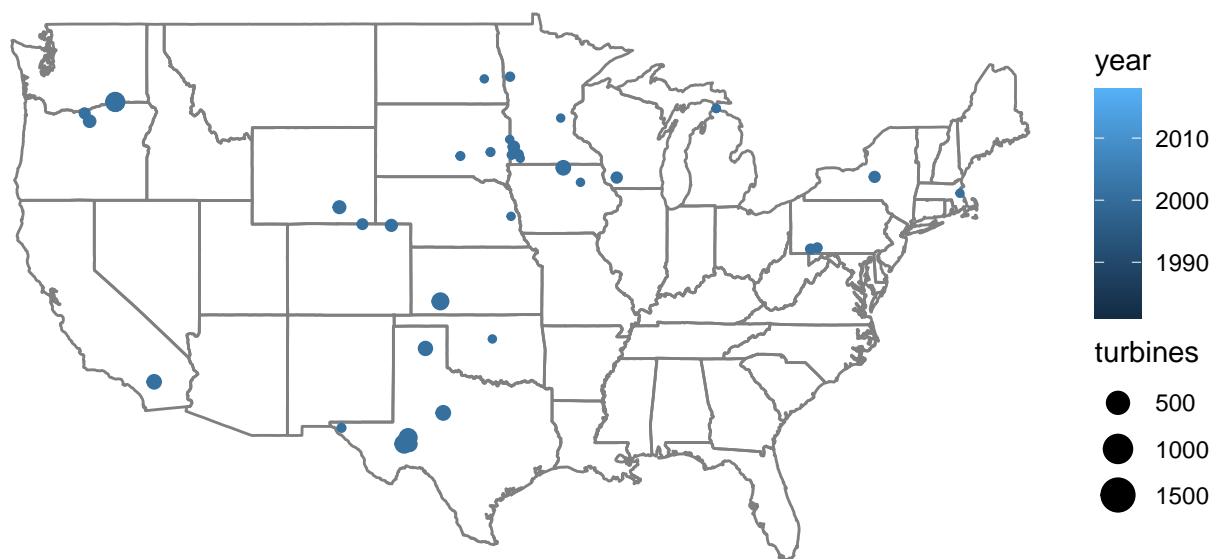


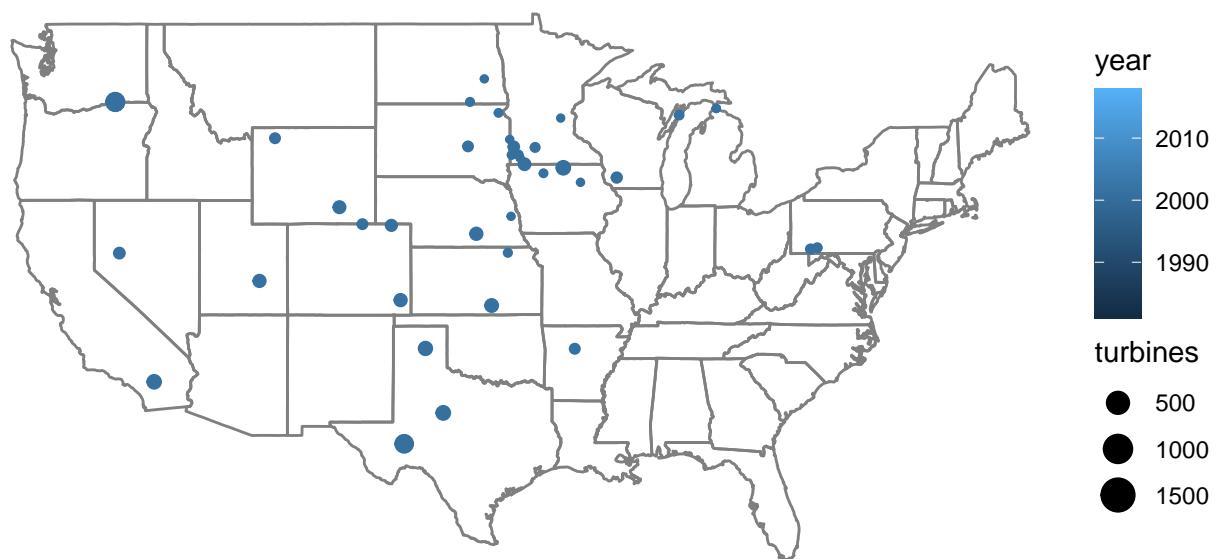


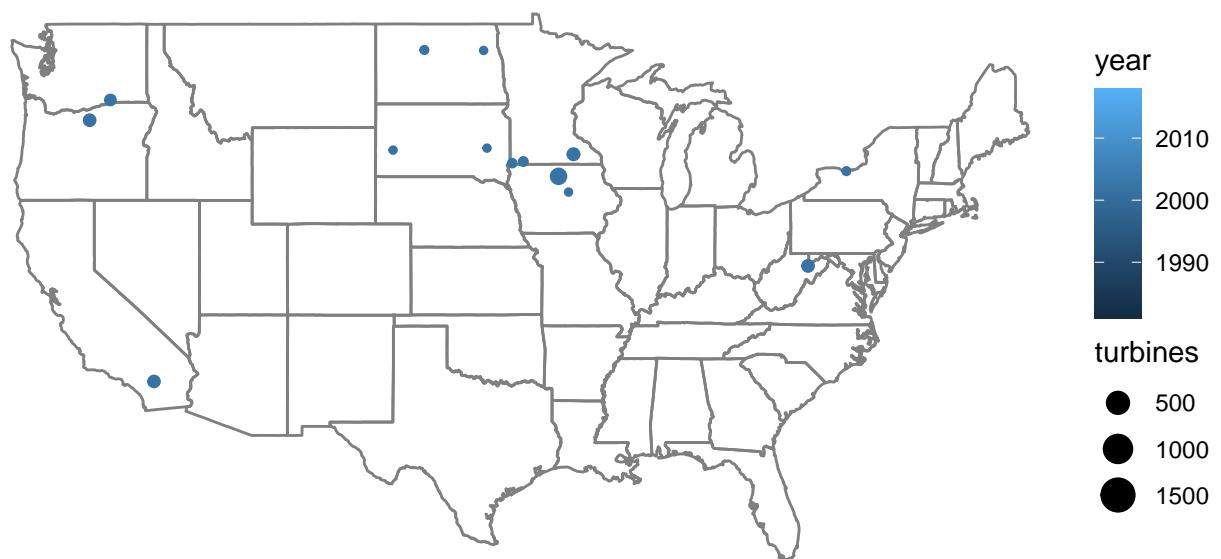


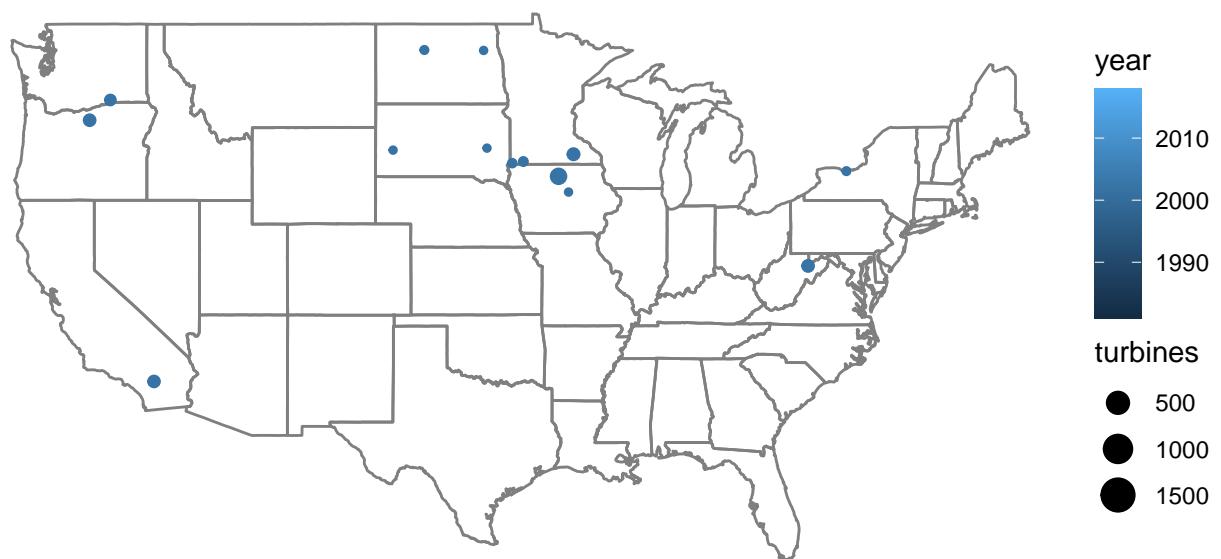


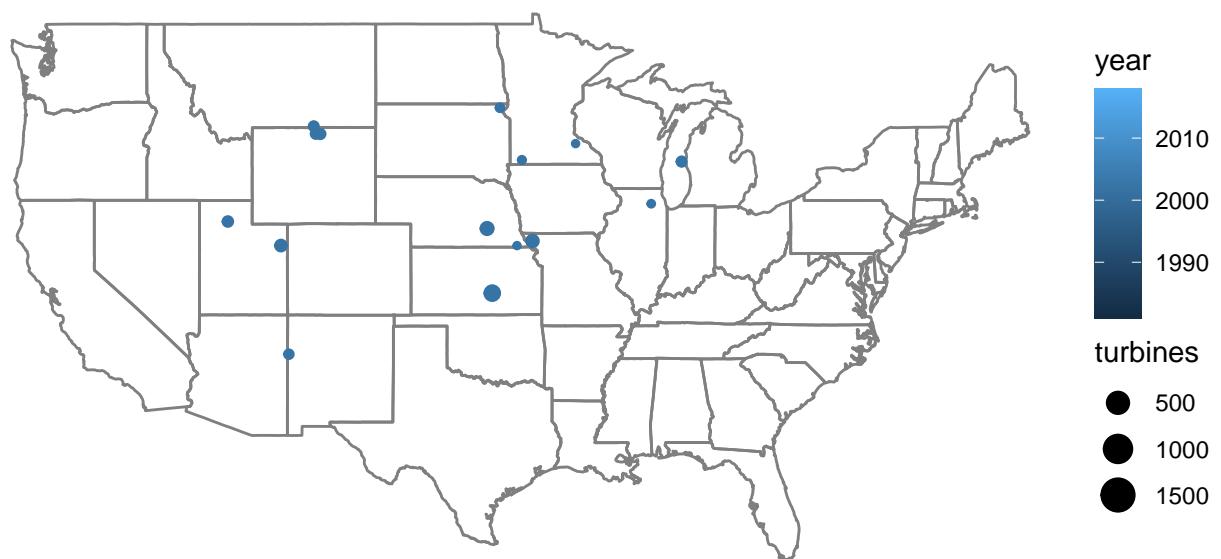


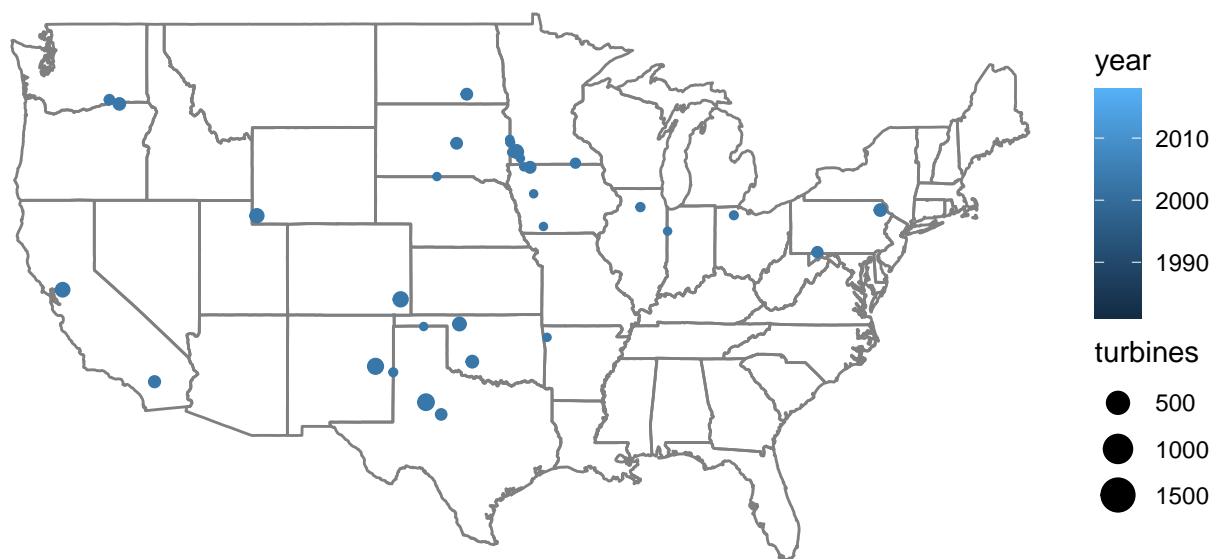


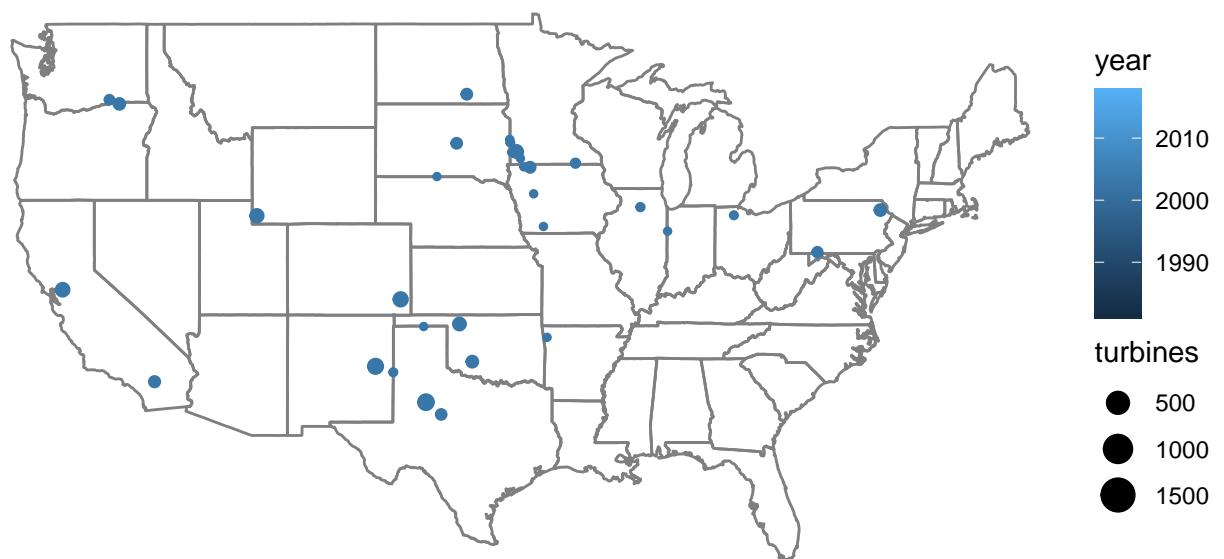


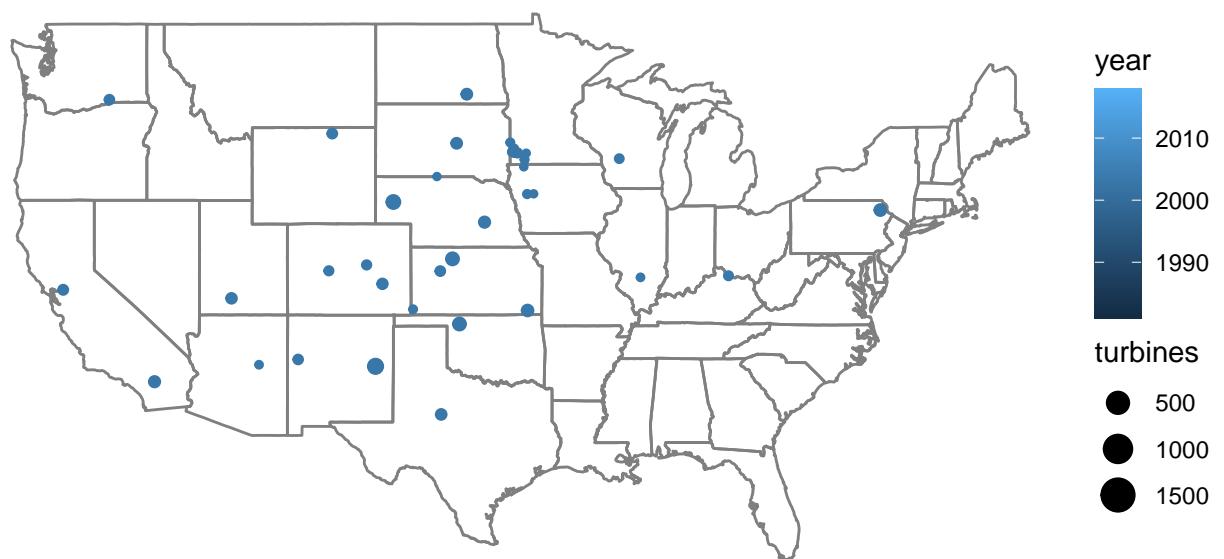


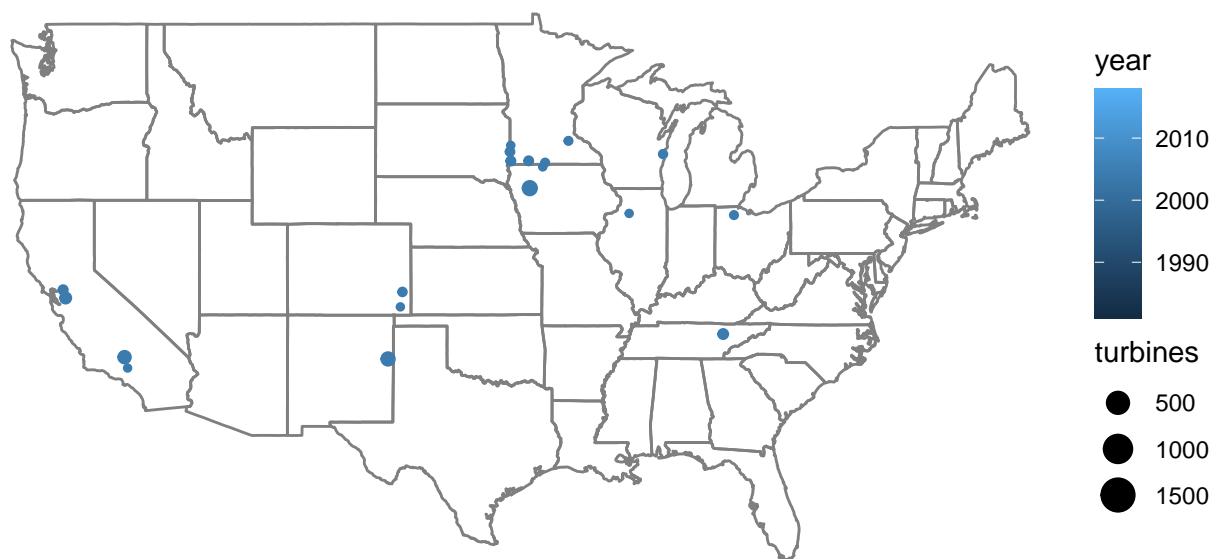


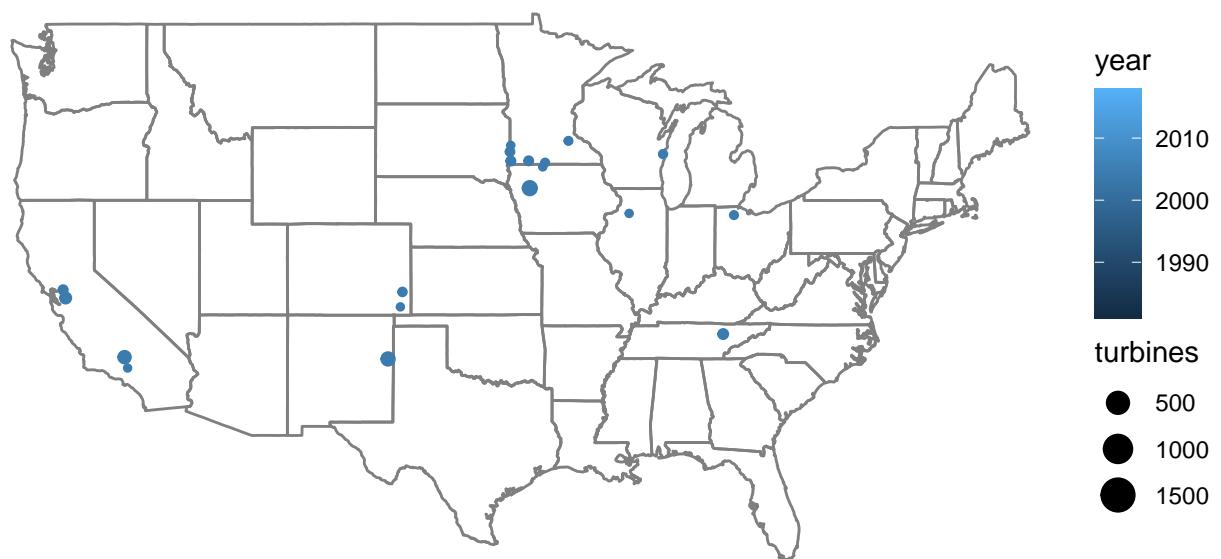


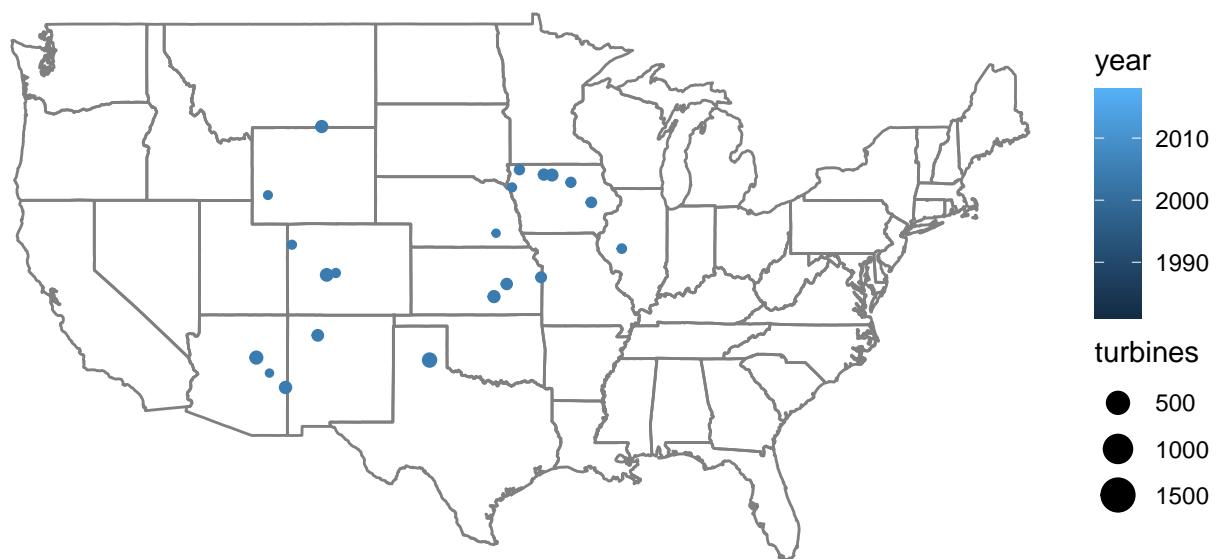


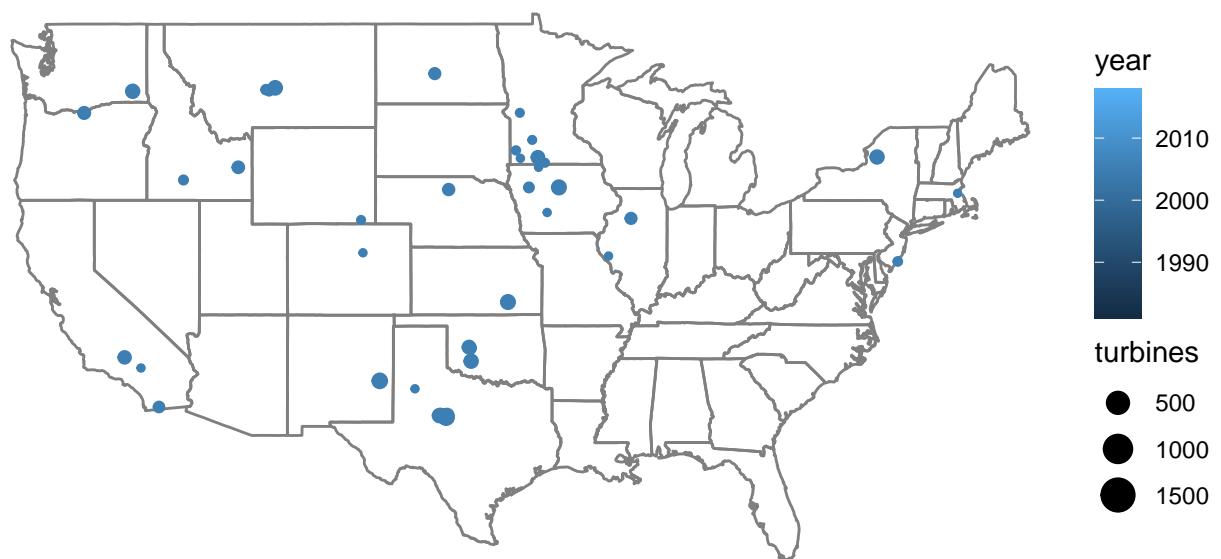


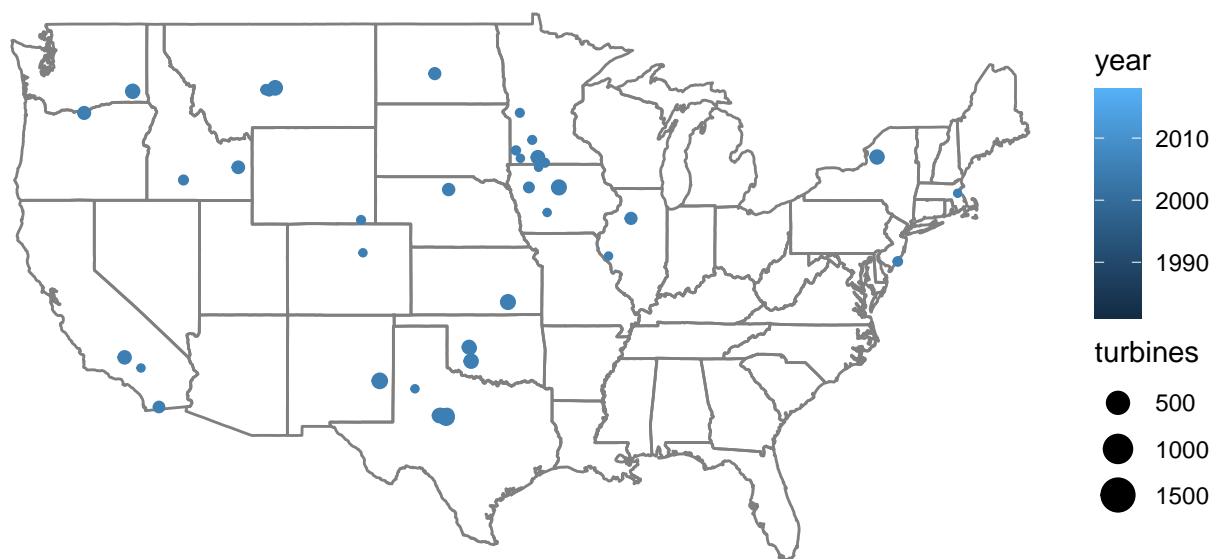


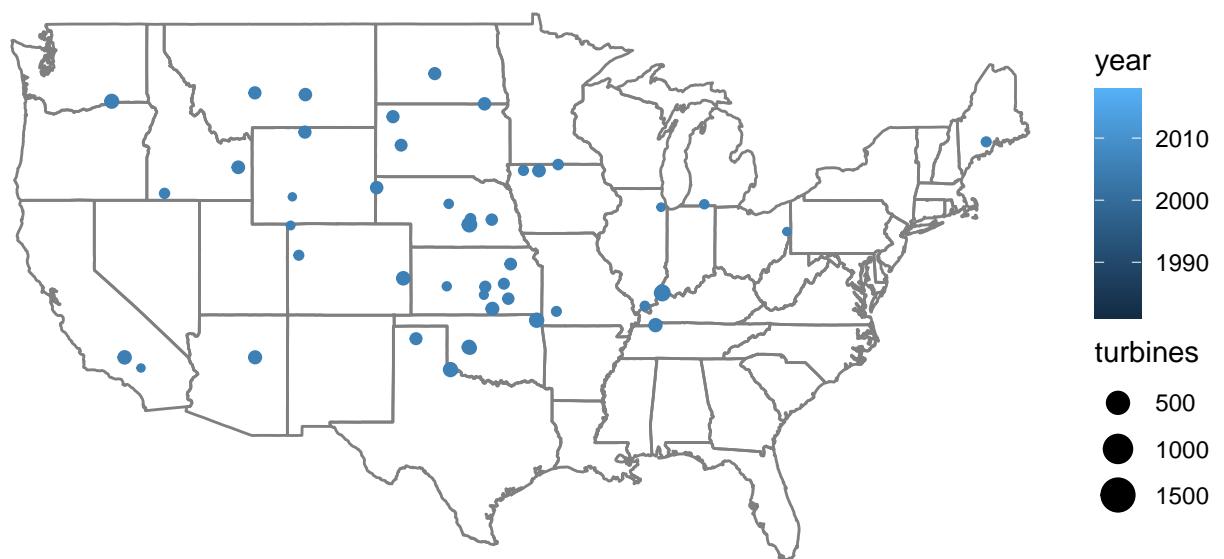


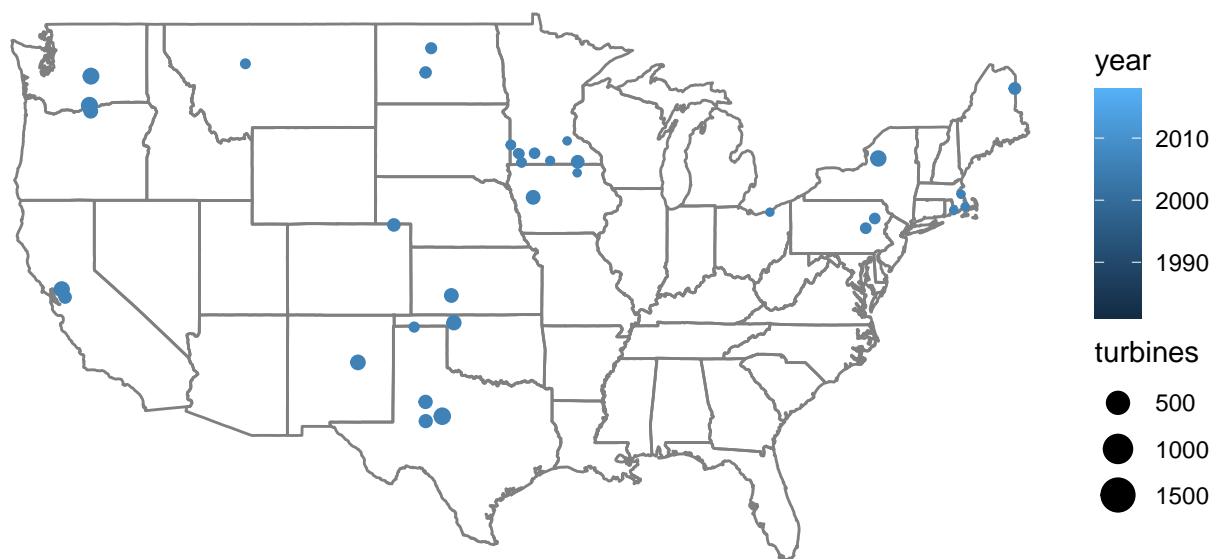


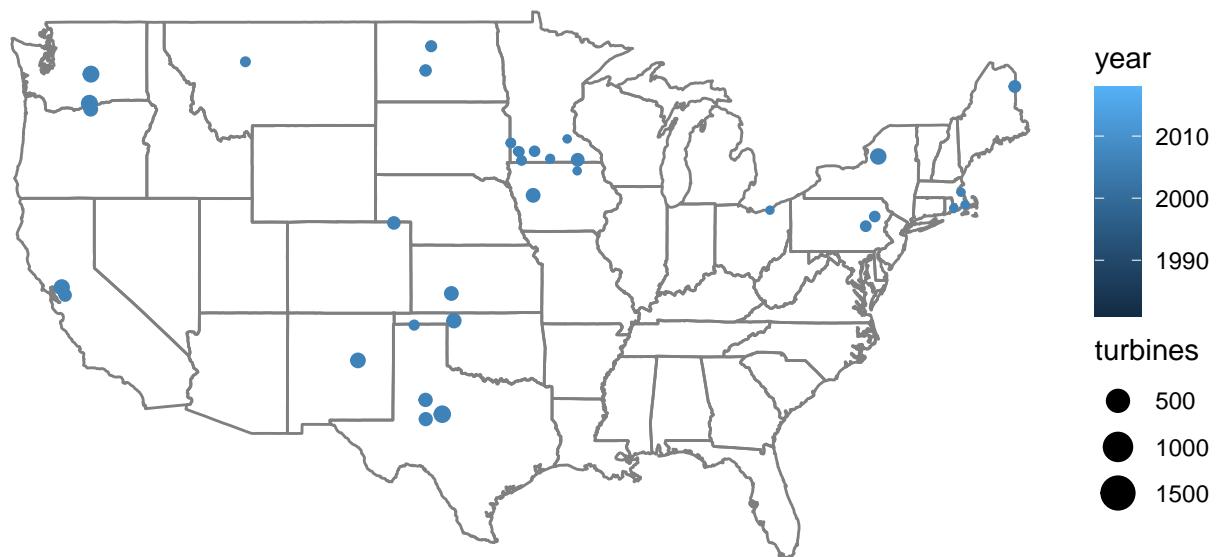


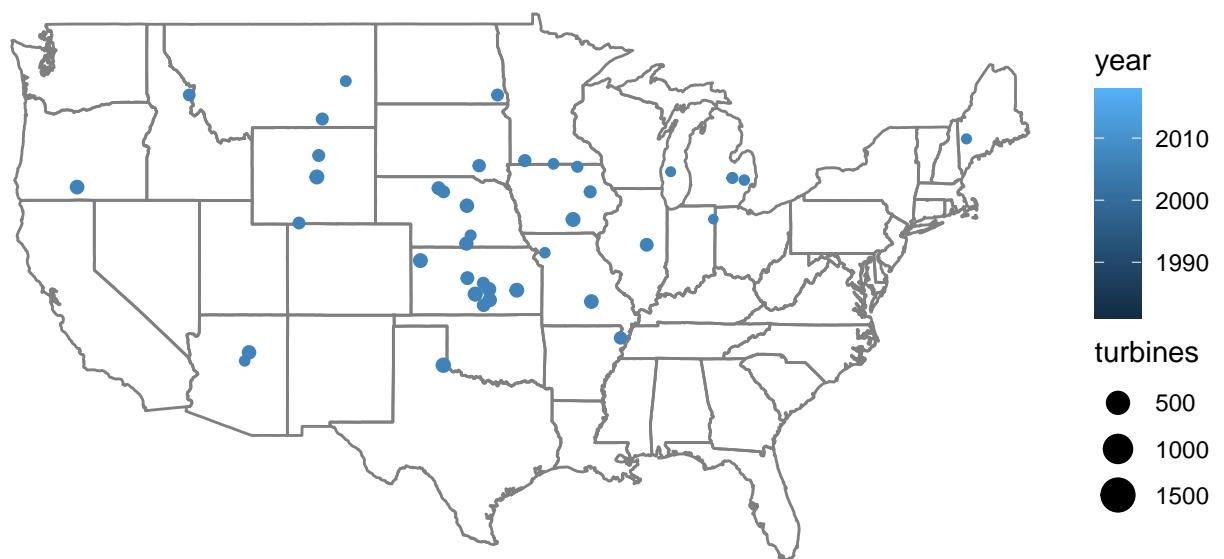


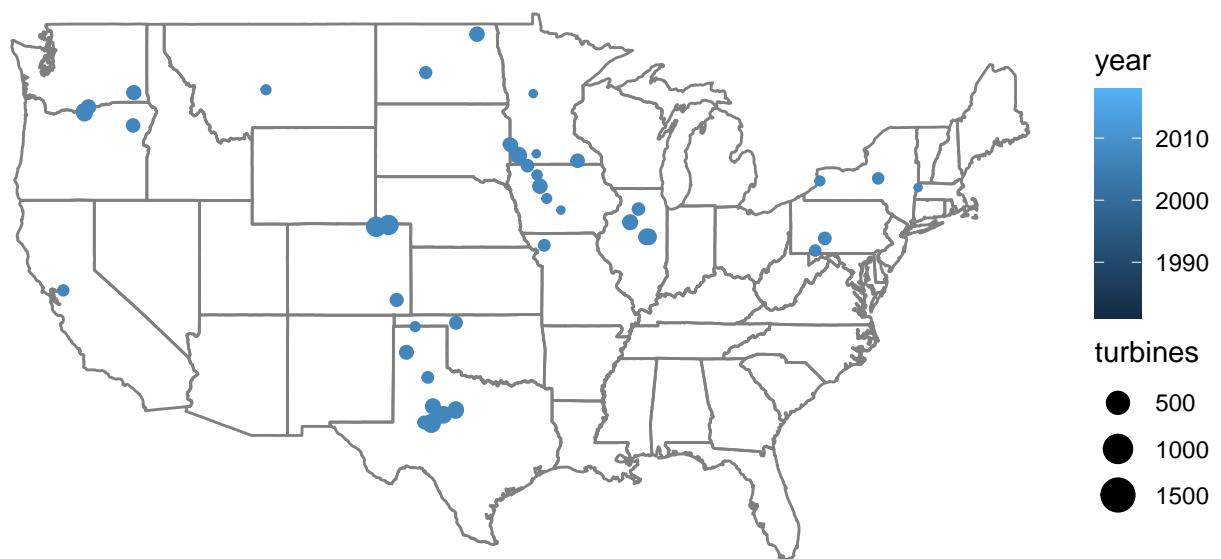


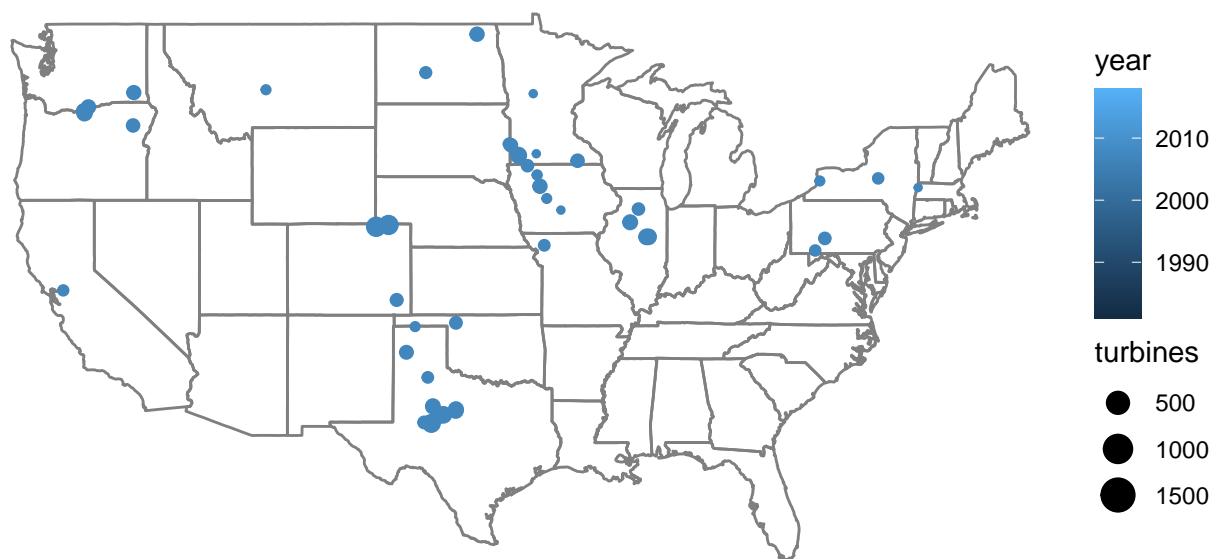


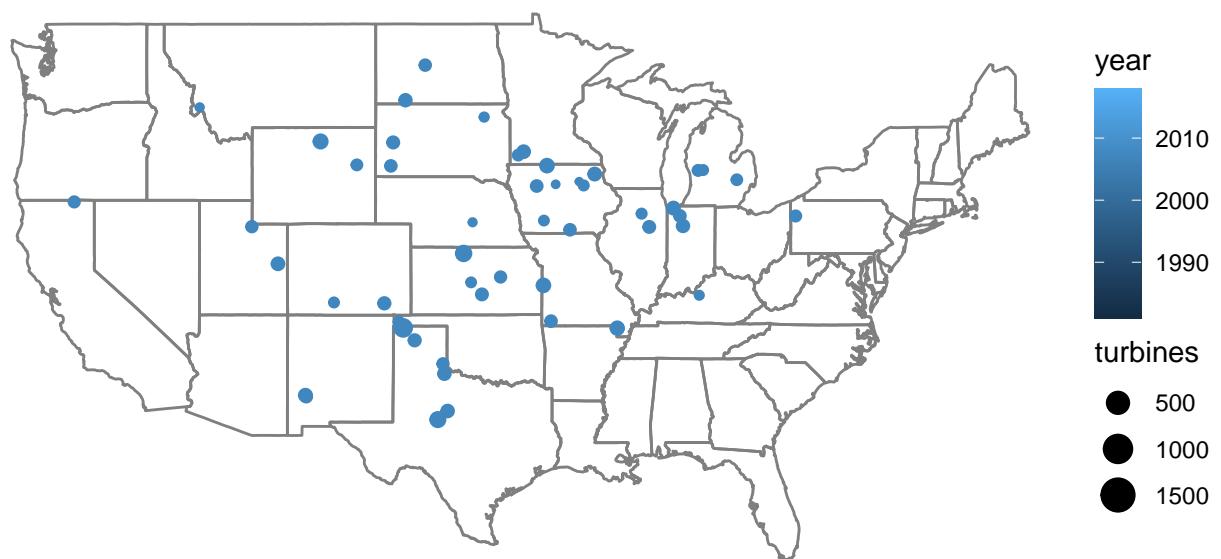


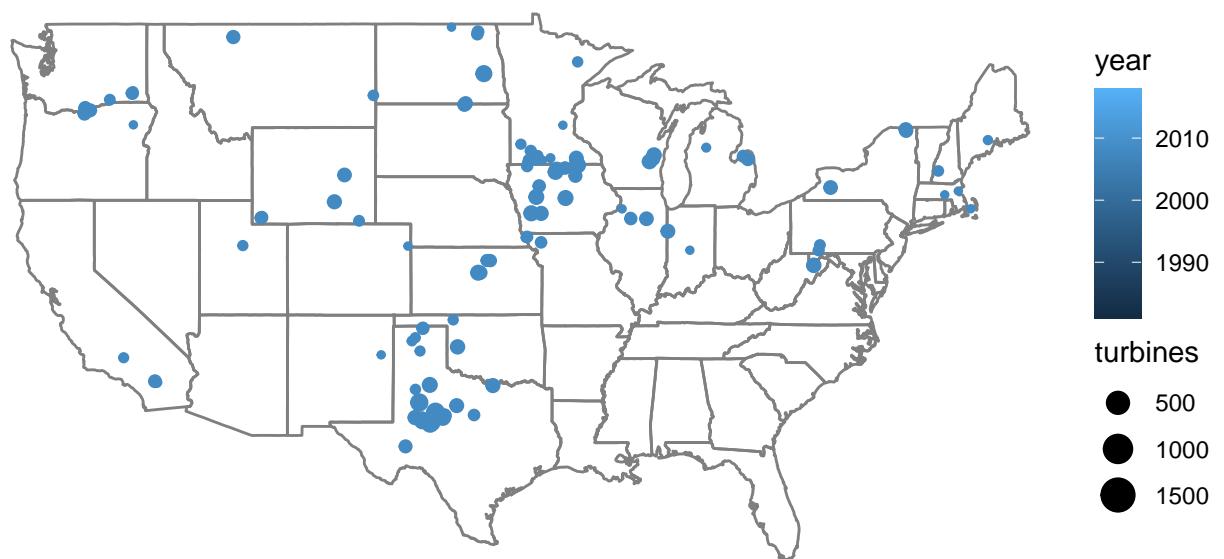


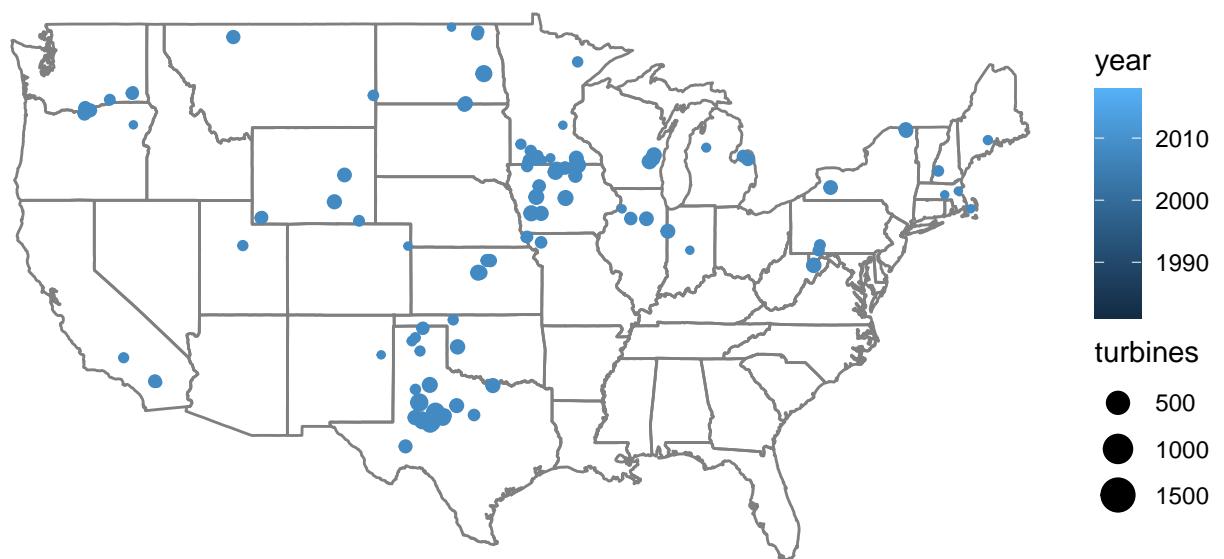


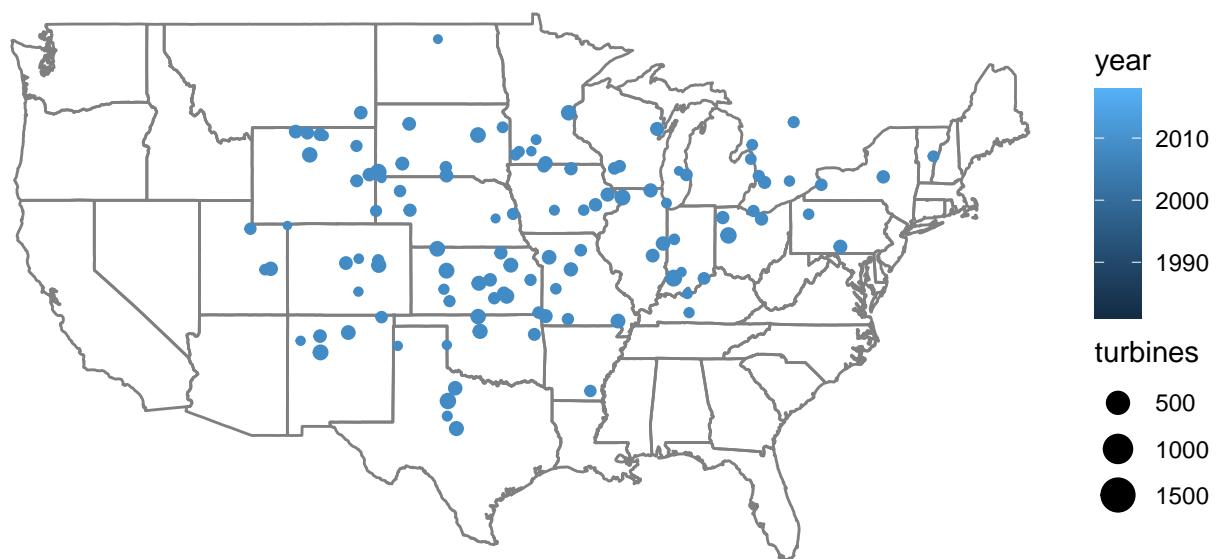


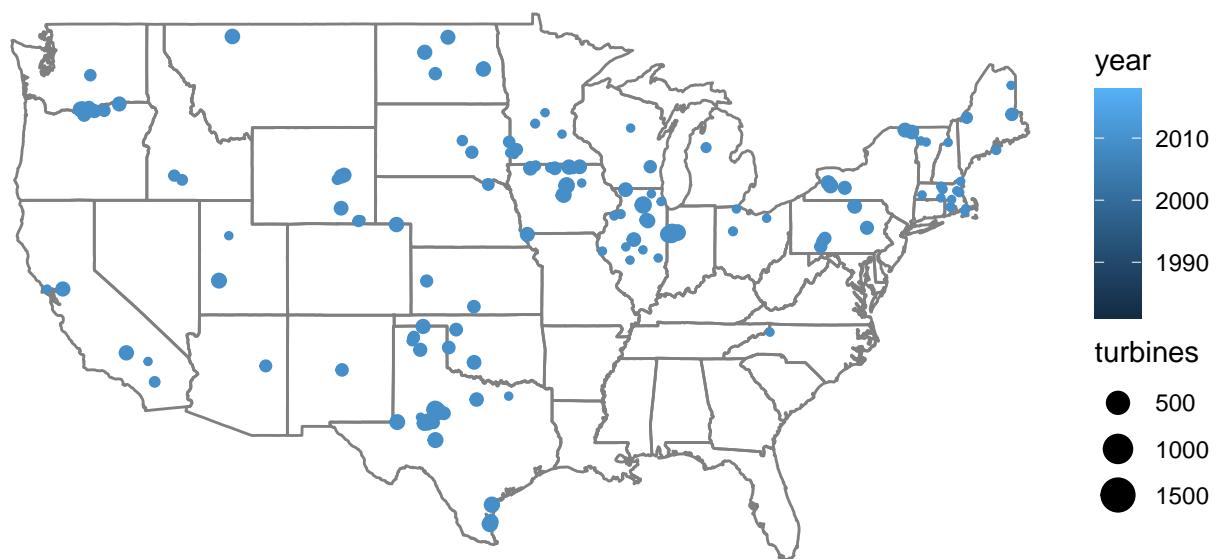


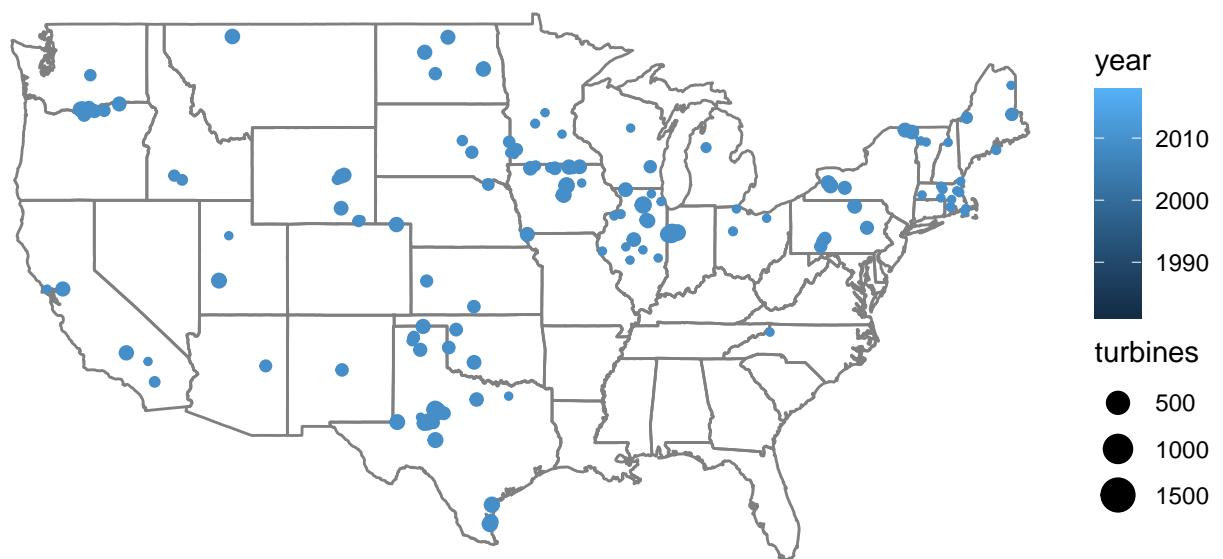


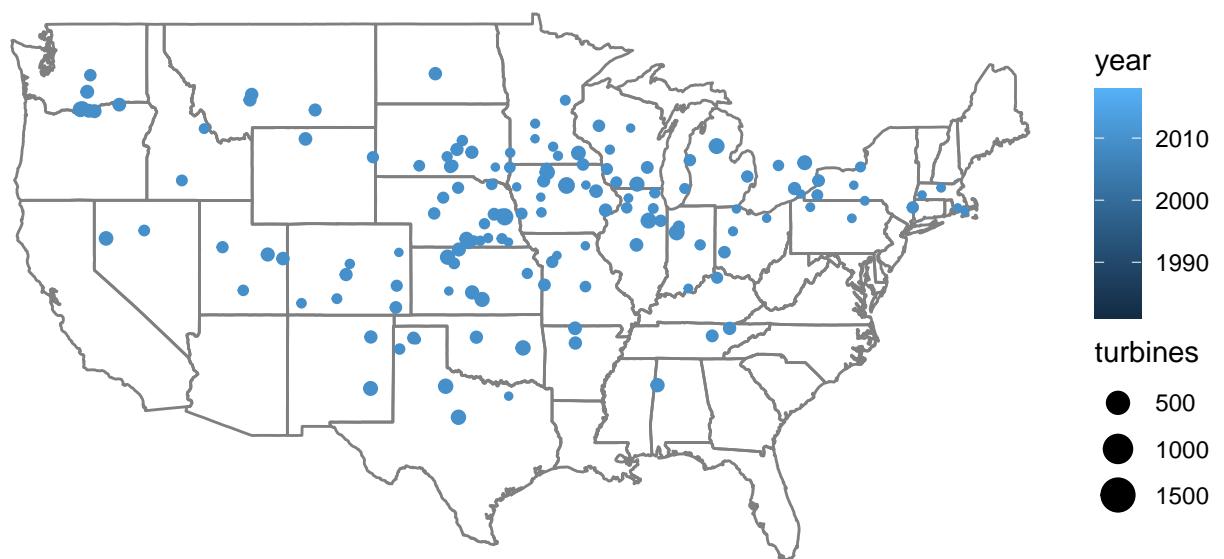


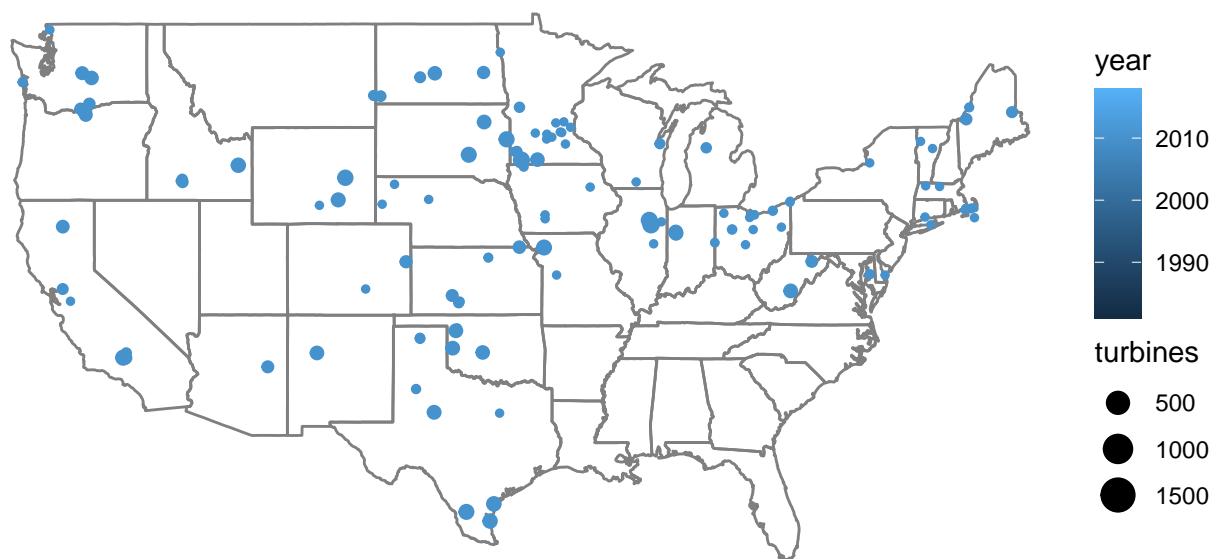


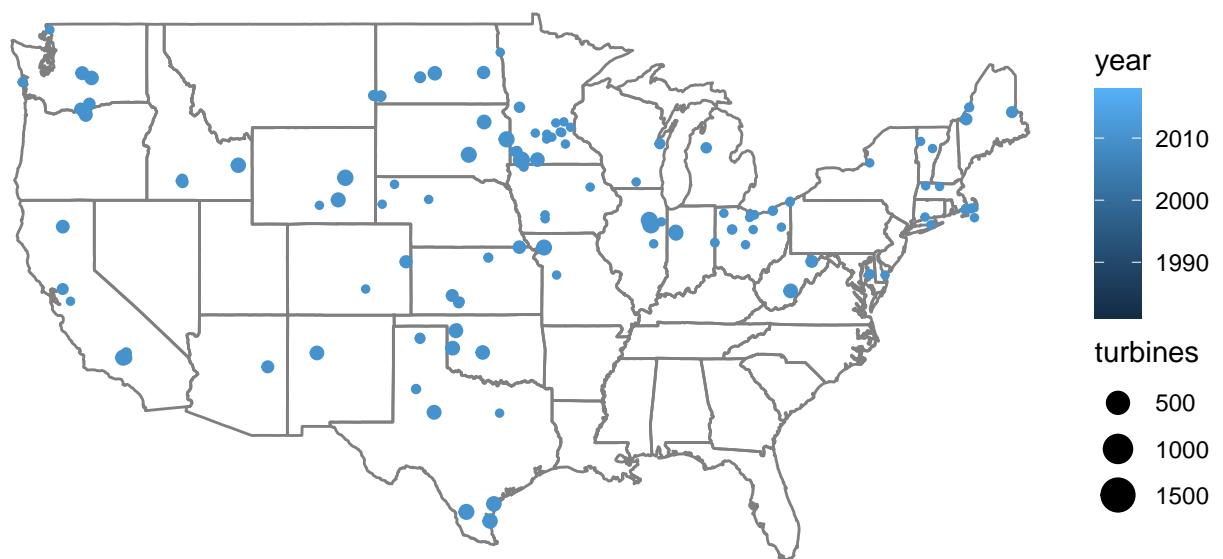


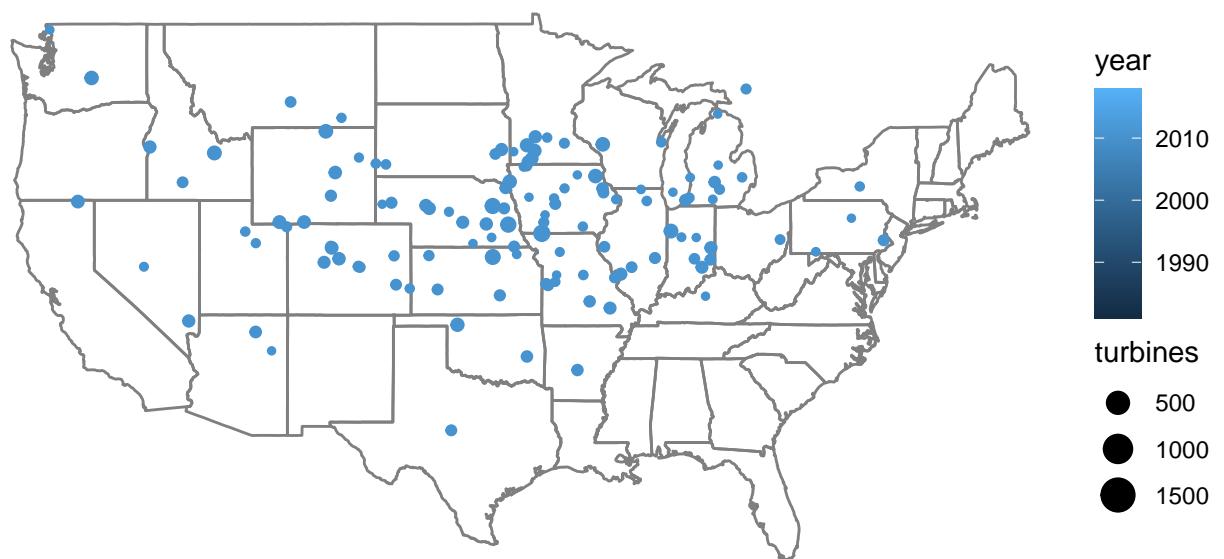


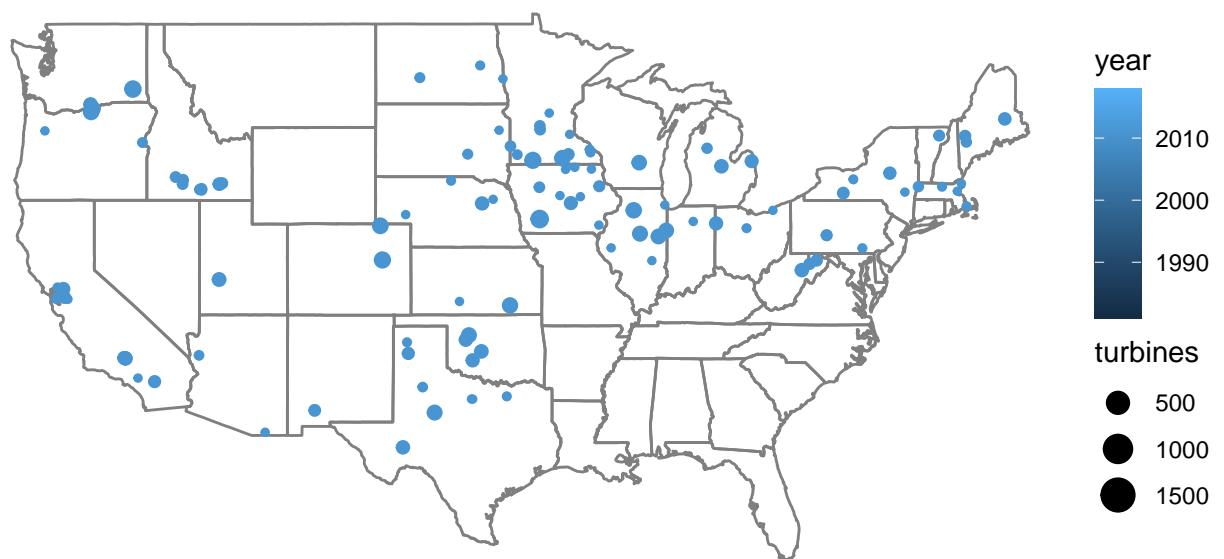




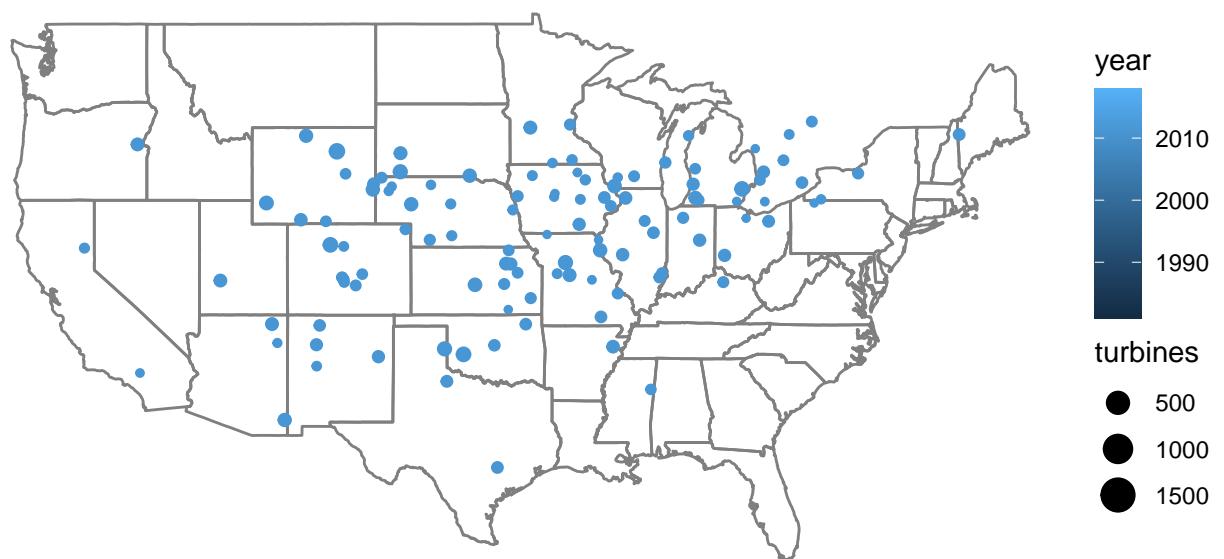


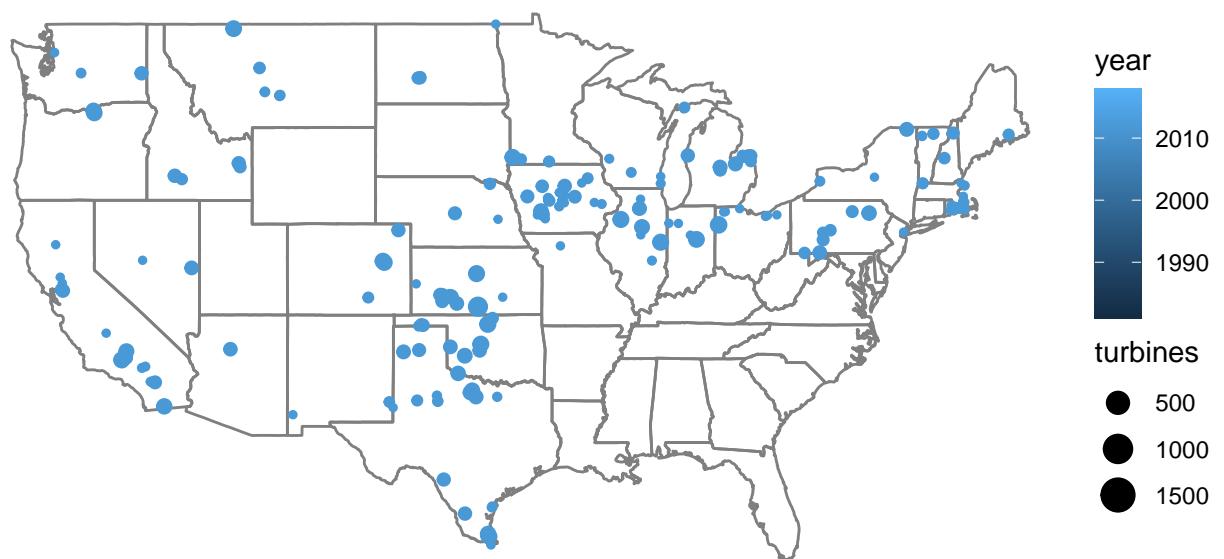


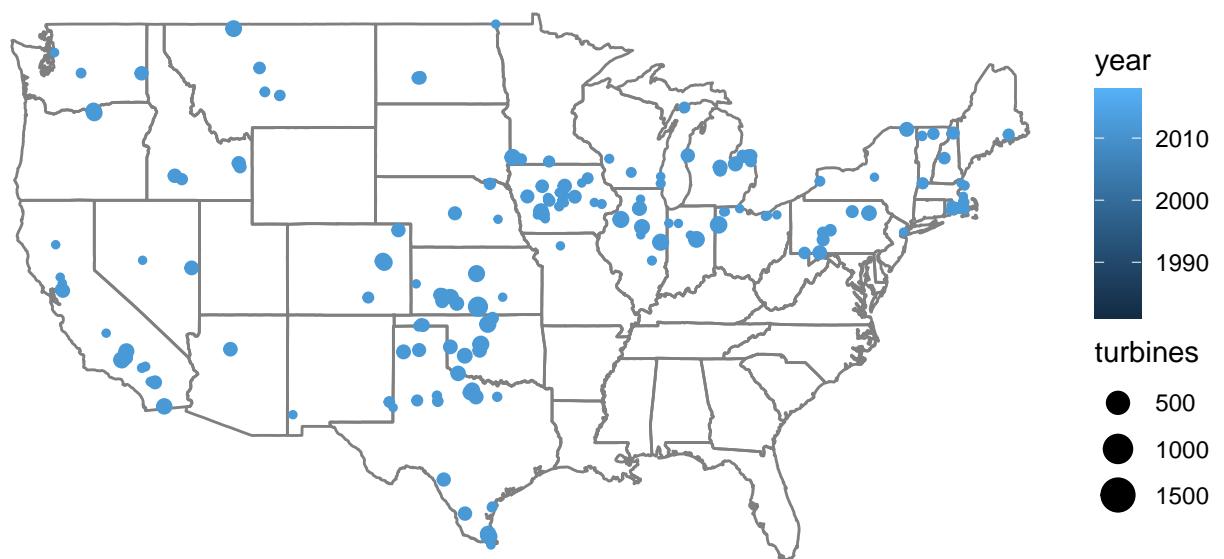


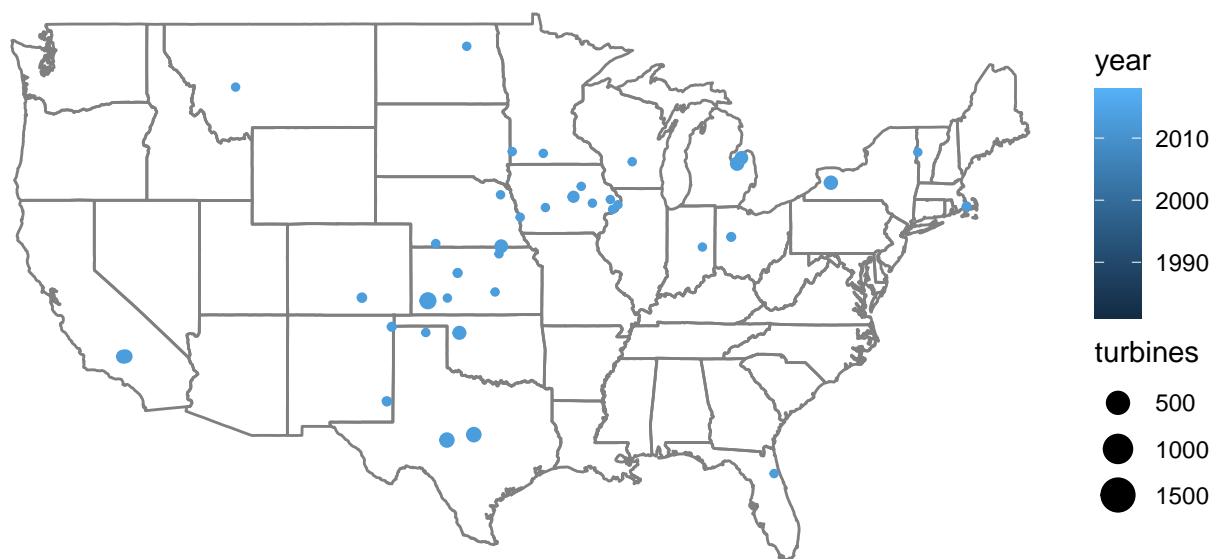


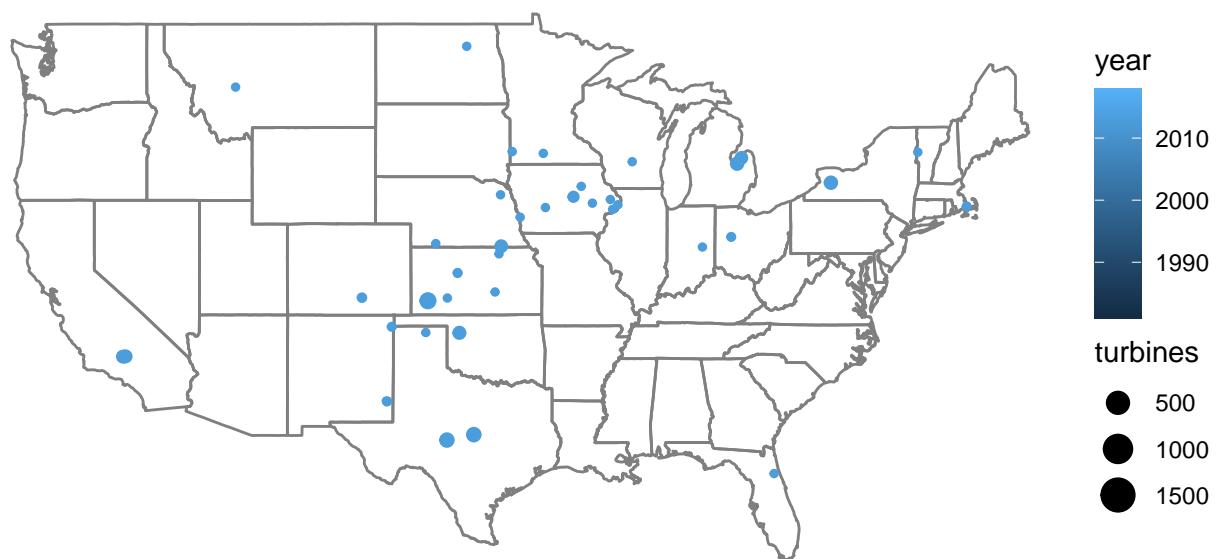


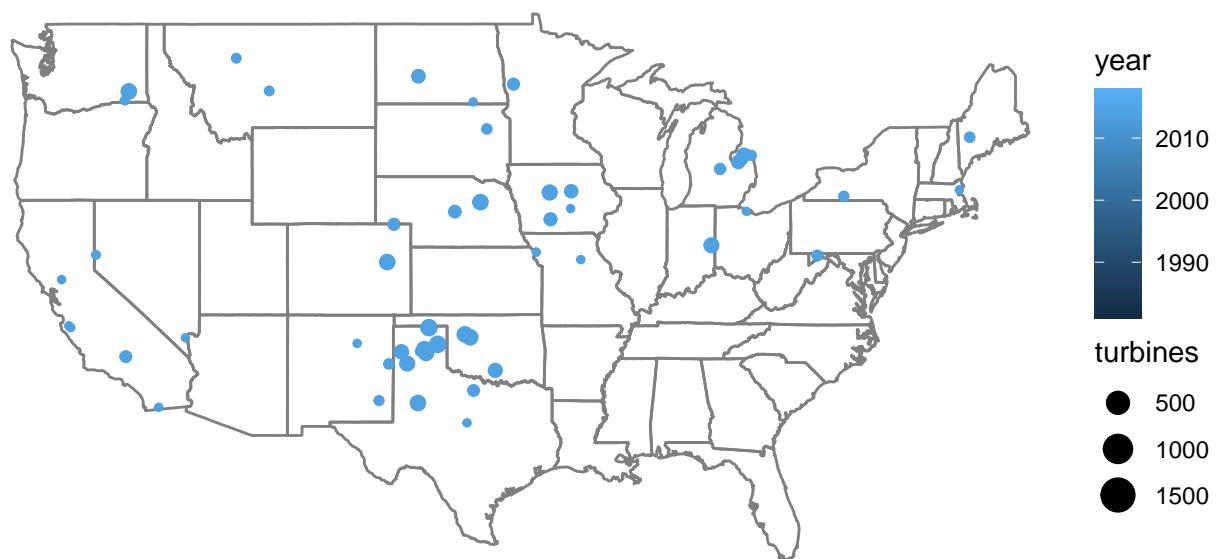


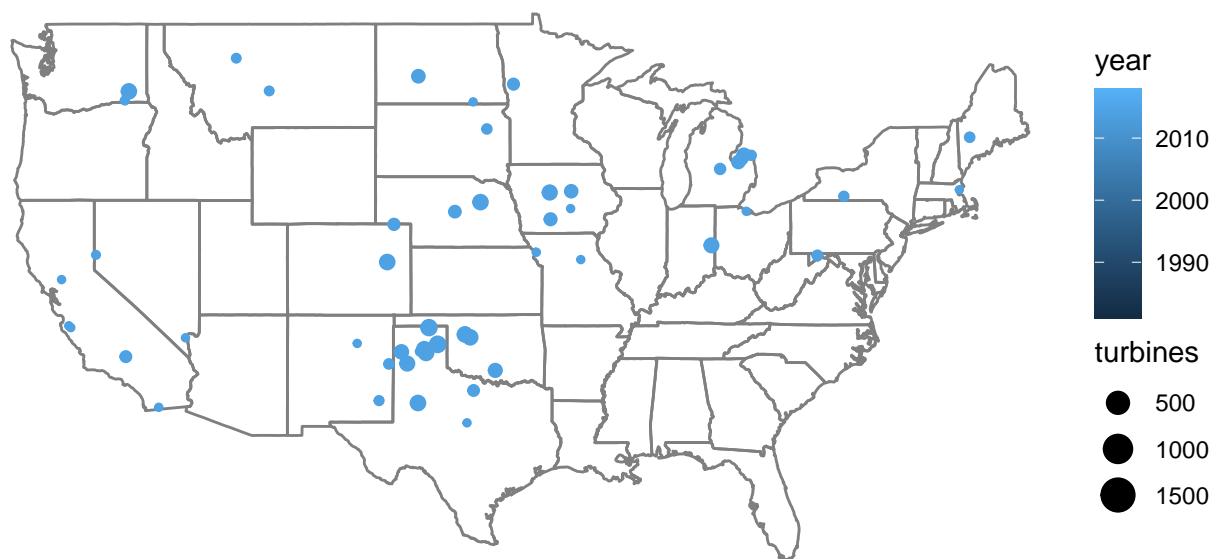


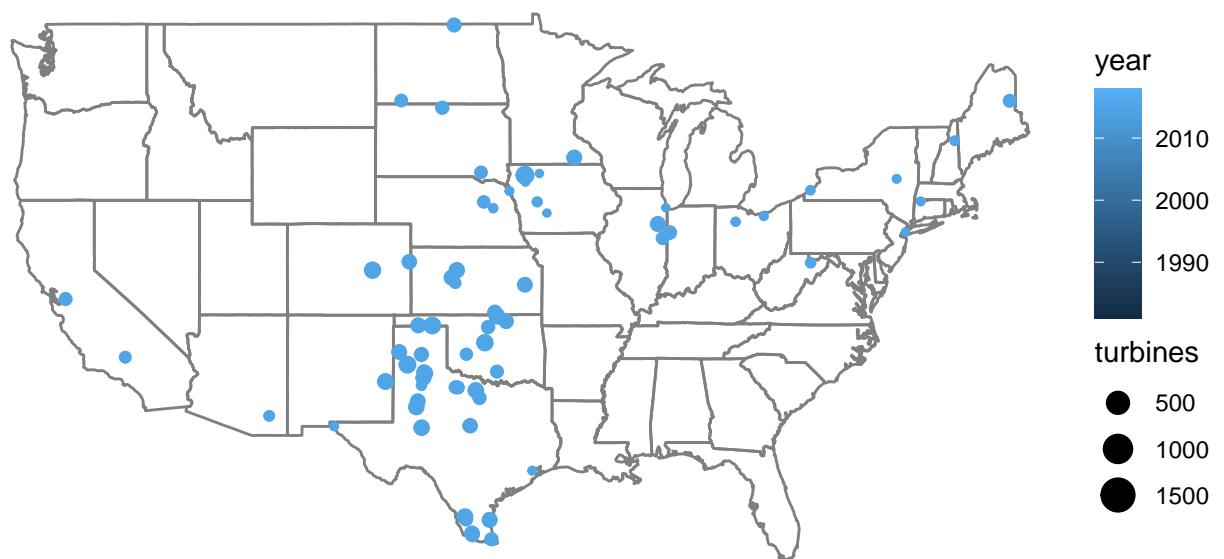


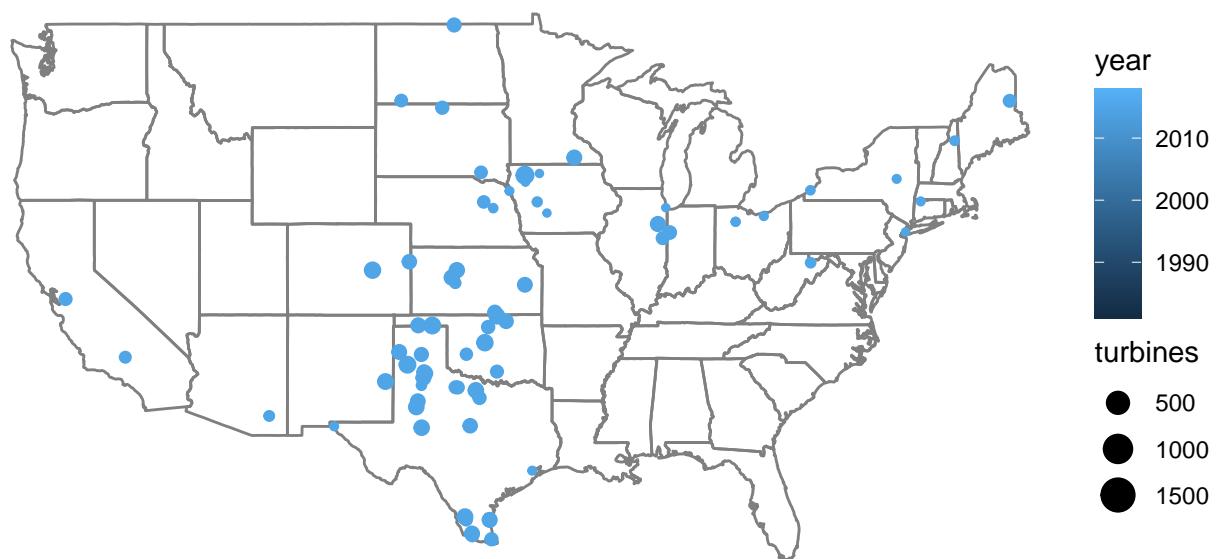


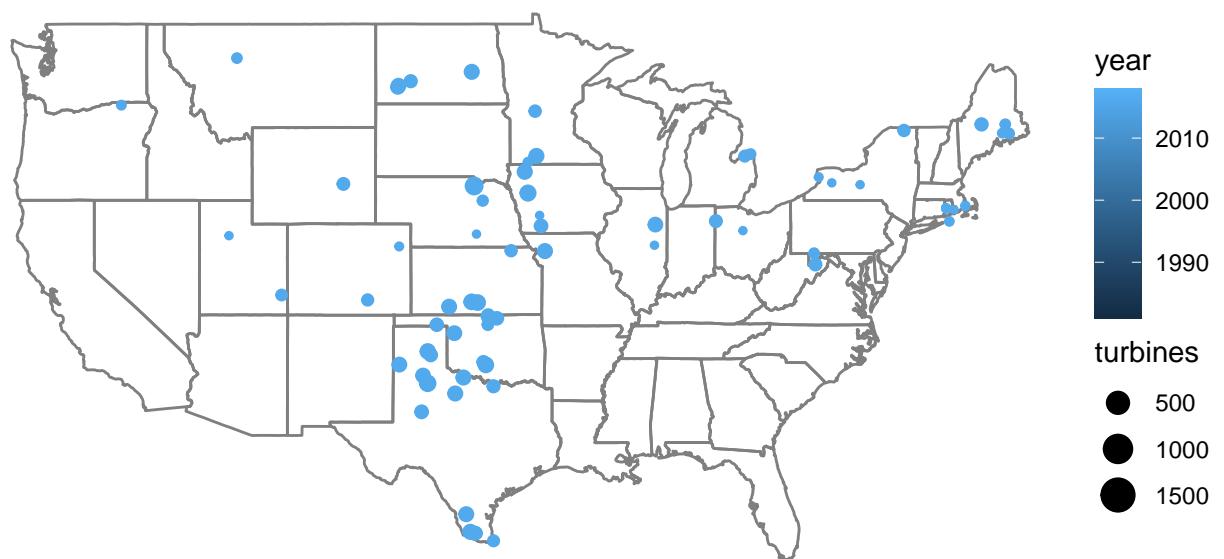


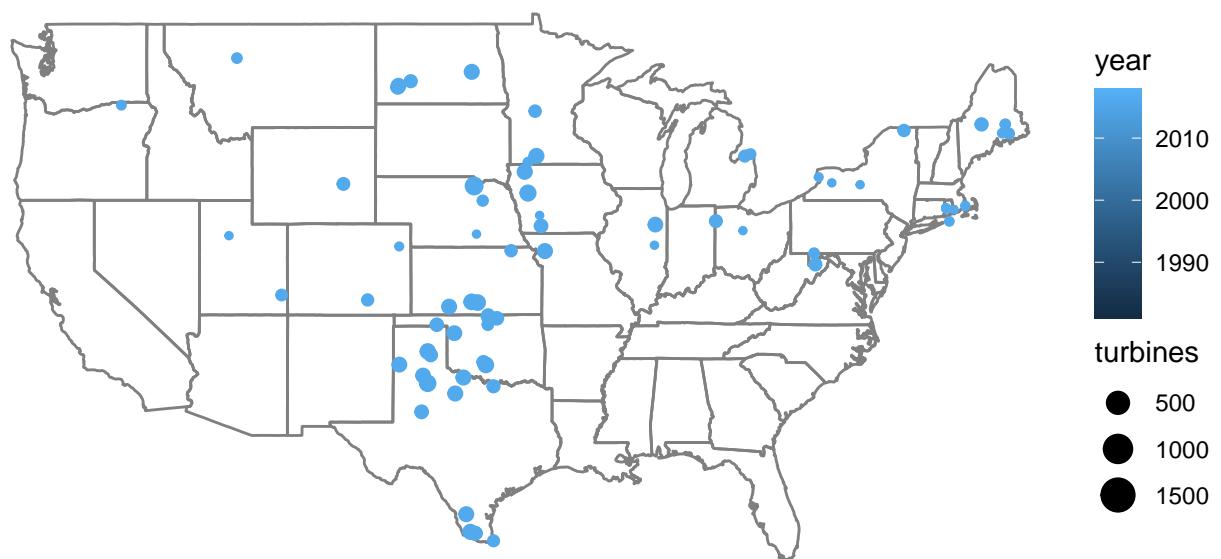


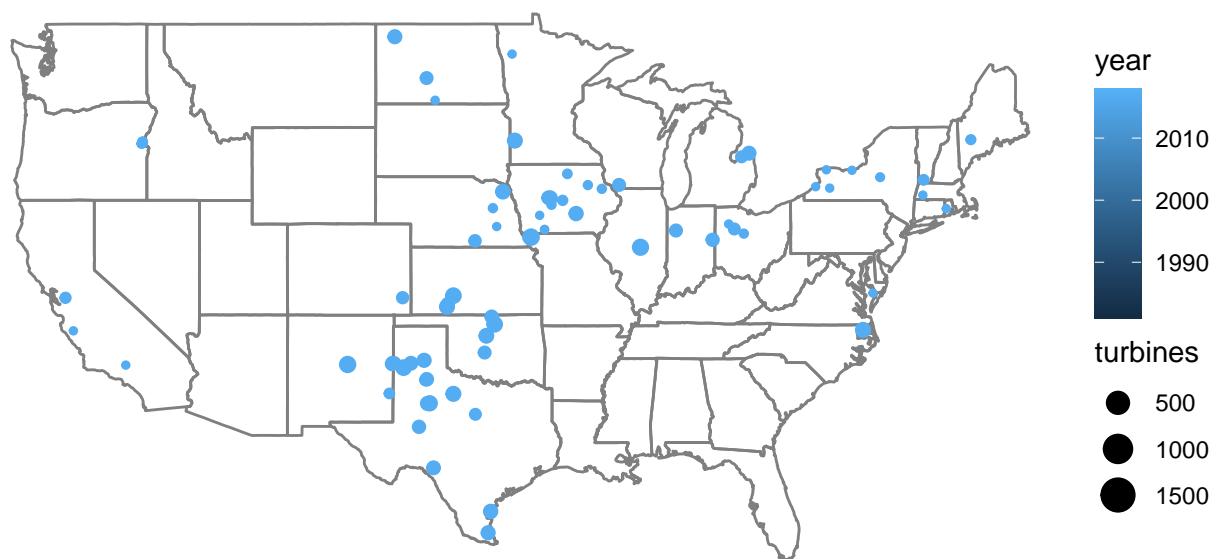


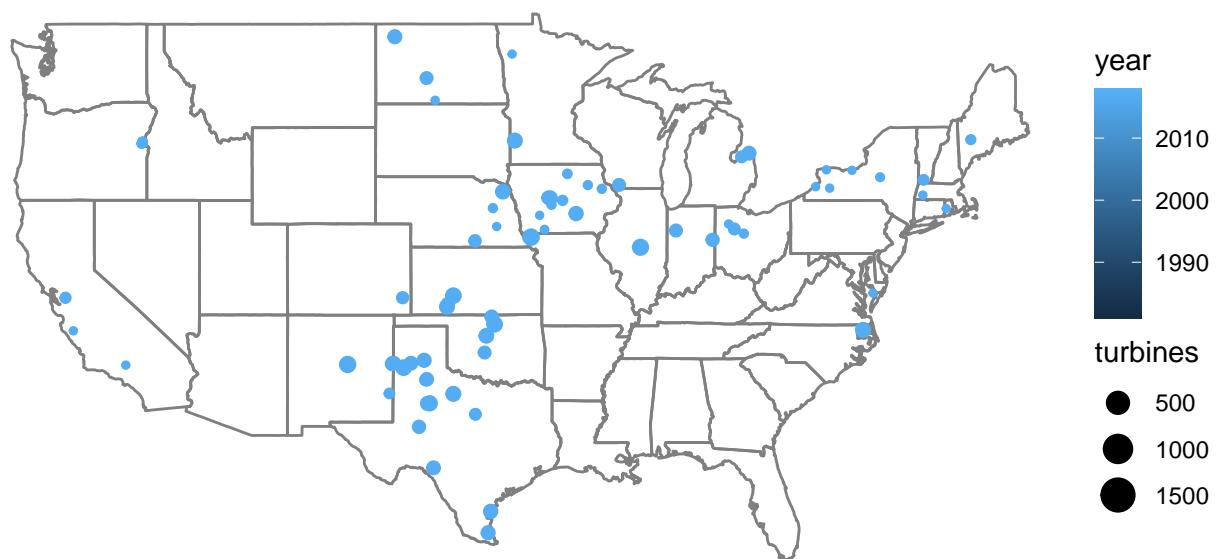


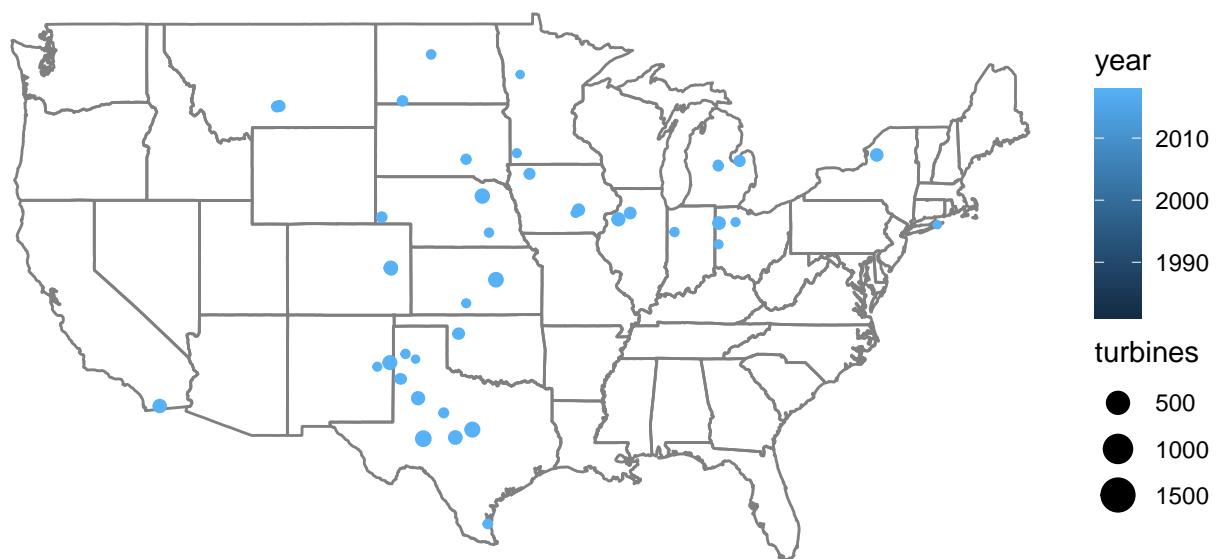


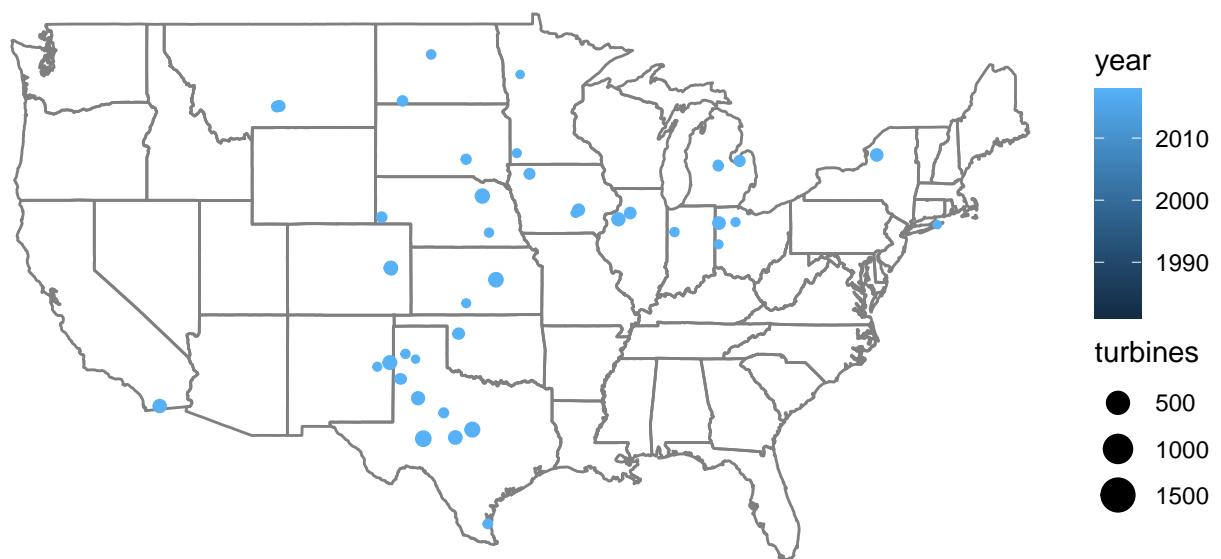














```
projects_by_year %>%
  ggplot(aes(lon, lat, size = turbines, color = year)) +
  borders("state") +
  geom_point() +
  transition_time(year) +
  coord_map() +
  labs(title = "Year: {frame_time}") +
  theme_void()
```

Year: 1981



Year: 1981



Year: 1982



Year: 1982



Year: 1982



Year: 1983



Year: 1983



Year: 1984



Year: 1984



Year: 1984



Year: 1985



Year: 1985



Year: 1985



Year: 1986



Year: 1986



Year: 1987



Year: 1987



Year: 1987



Year: 1988



Year: 1988



Year: 1988



Year: 1989



Year: 1989



Year: 1990



Year: 1990



Year: 1990



Year: 1991



Year: 1991



Year: 1991



Year: 1992



Year: 1992



Year: 1993



Year: 1993



Year: 1993



Year: 1994



Year: 1994



Year: 1994



Year: 1995



Year: 1995



Year: 1996



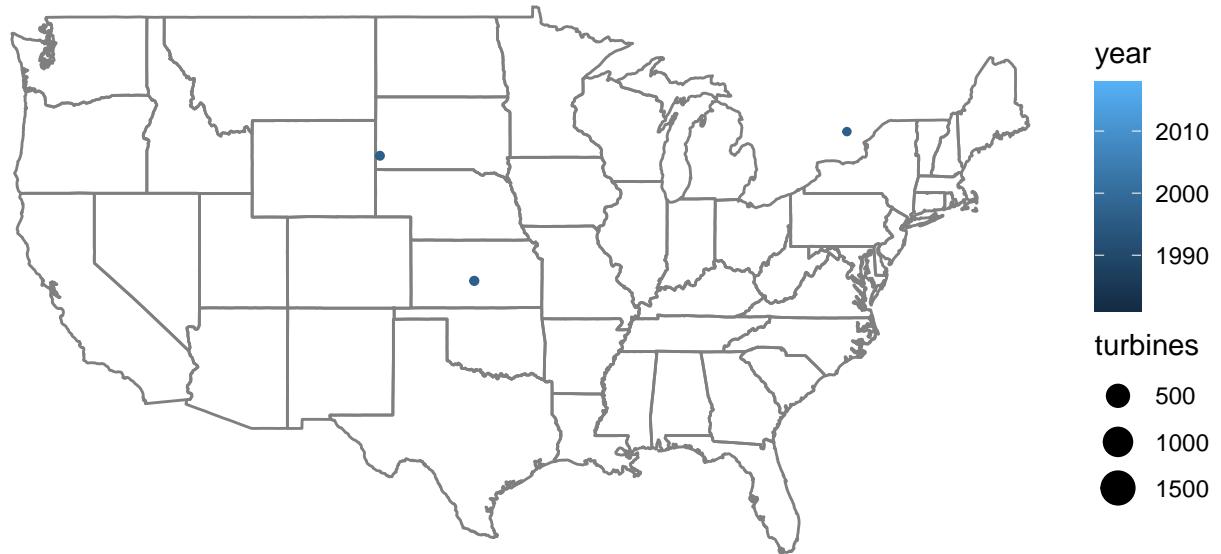
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Year: 1996



Year: 1997



Year: 1997



Year: 1997



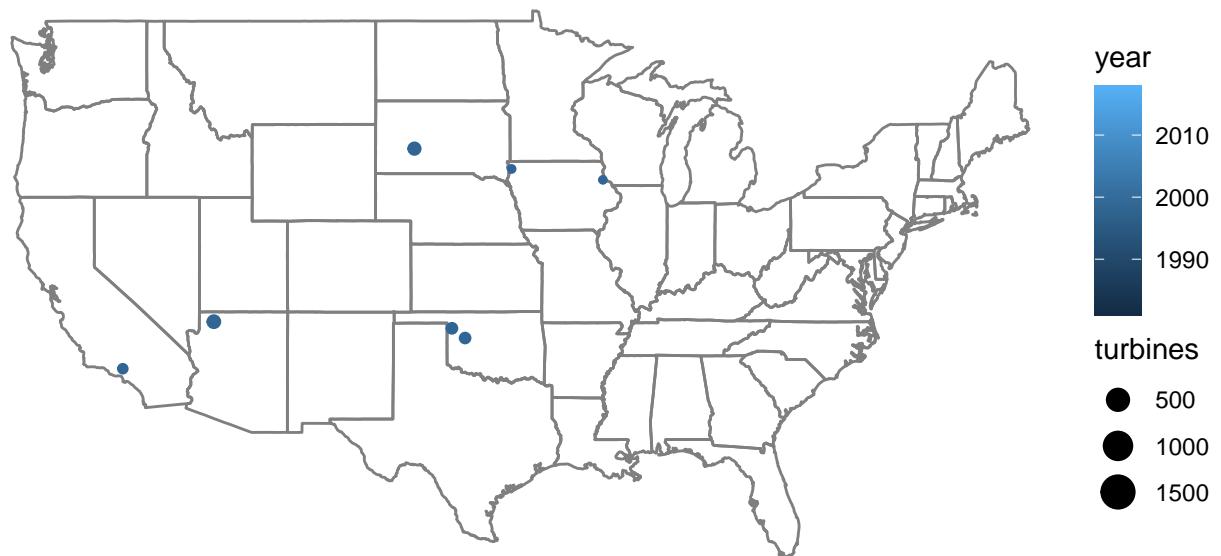
Year: 1998



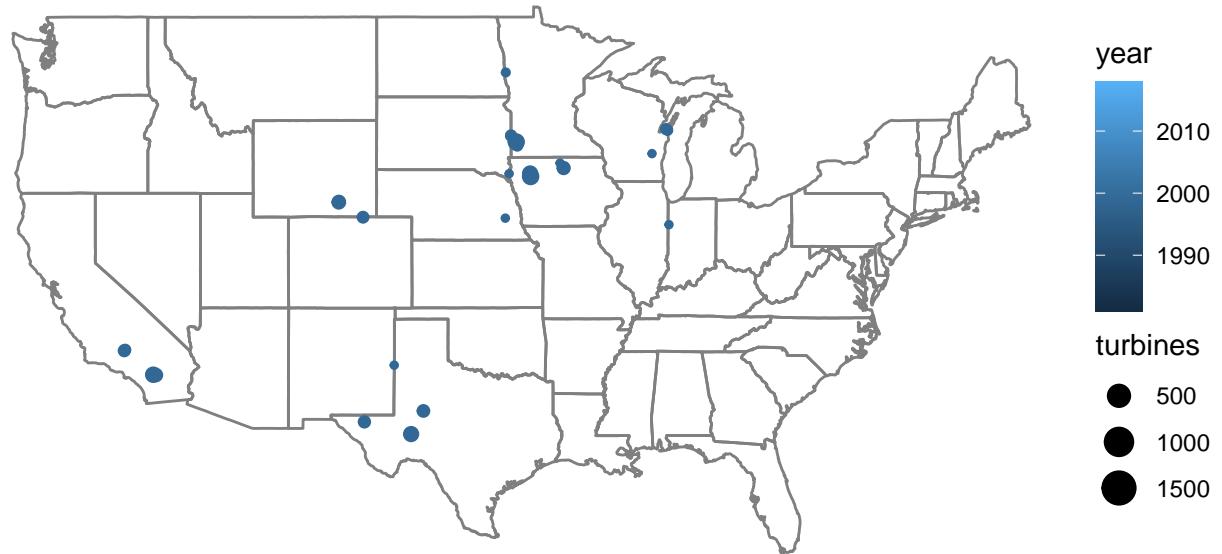
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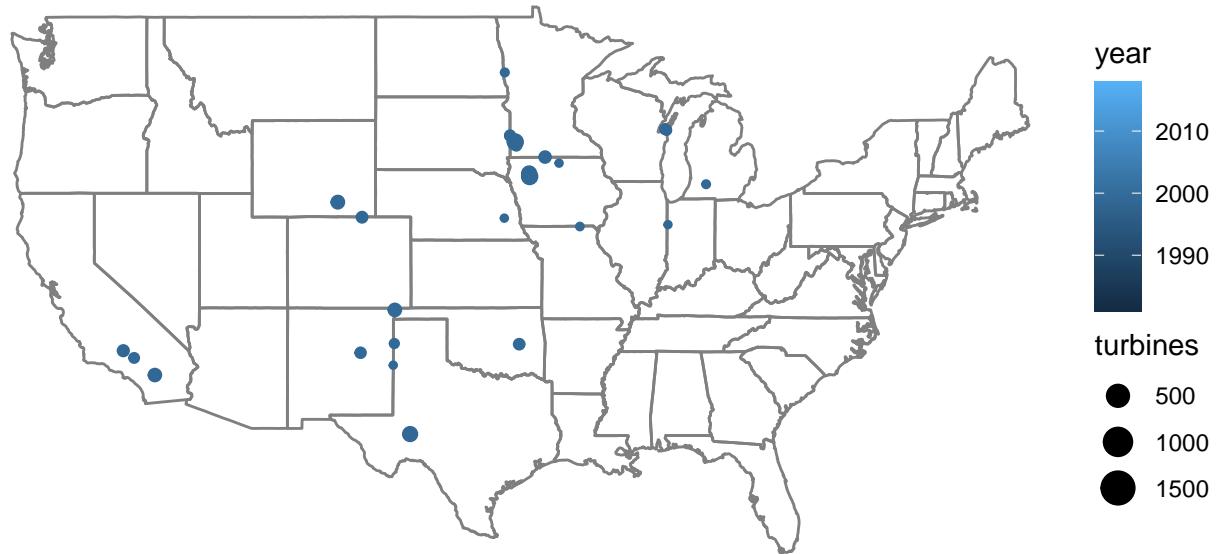
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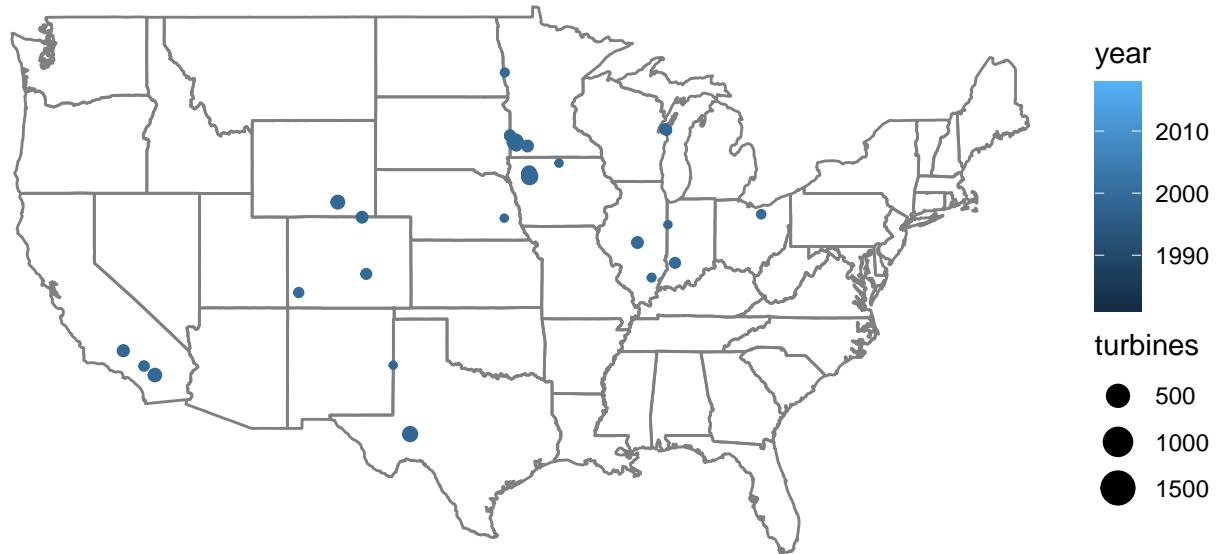
Year: 1999



Year: 1999



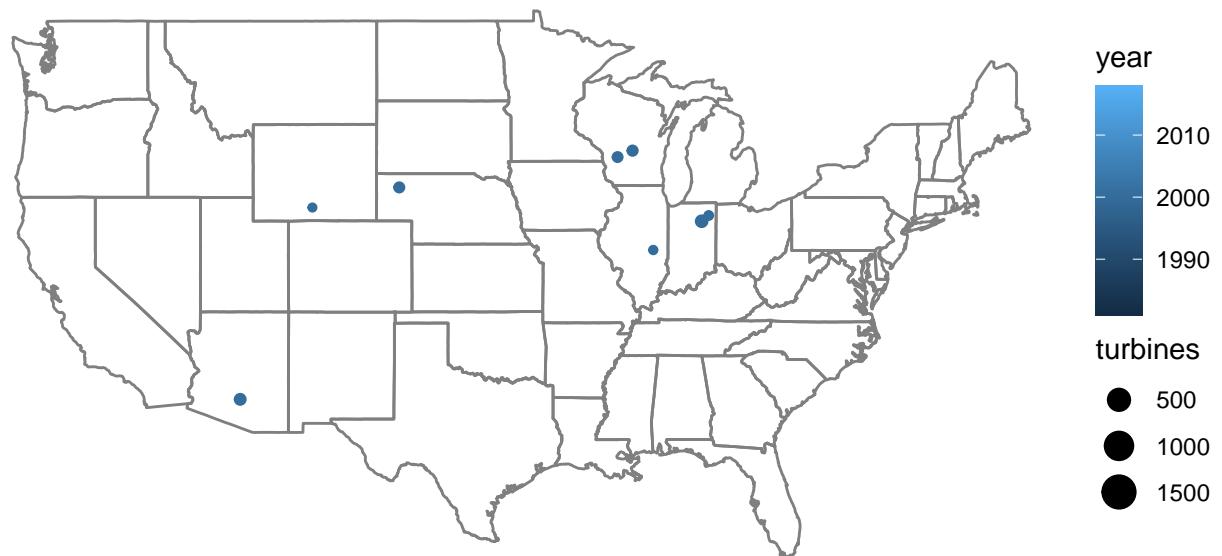
Year: 2000



Year: 2000



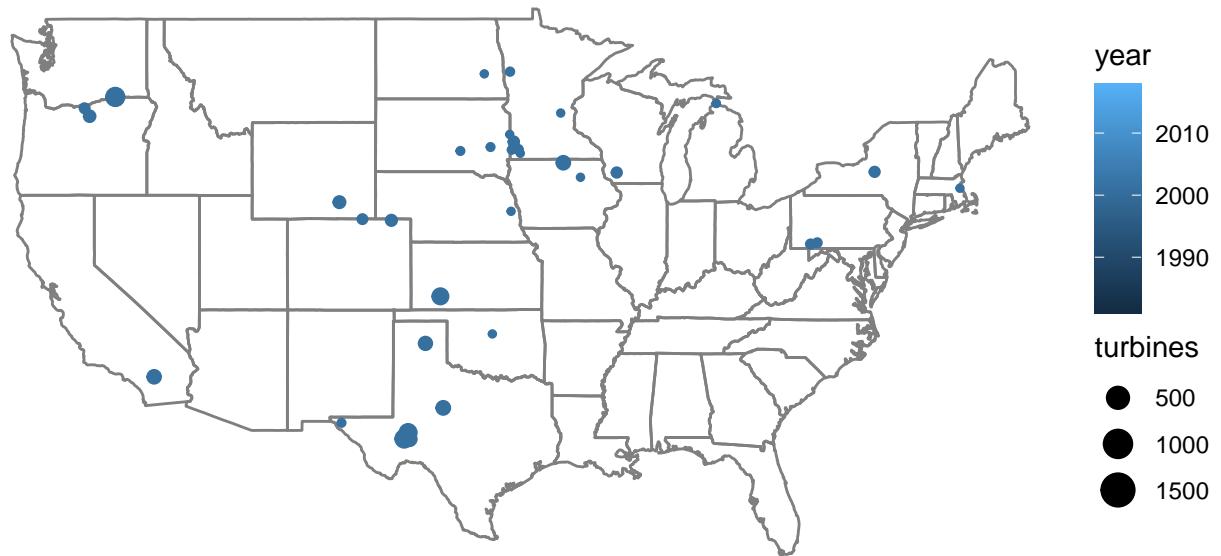
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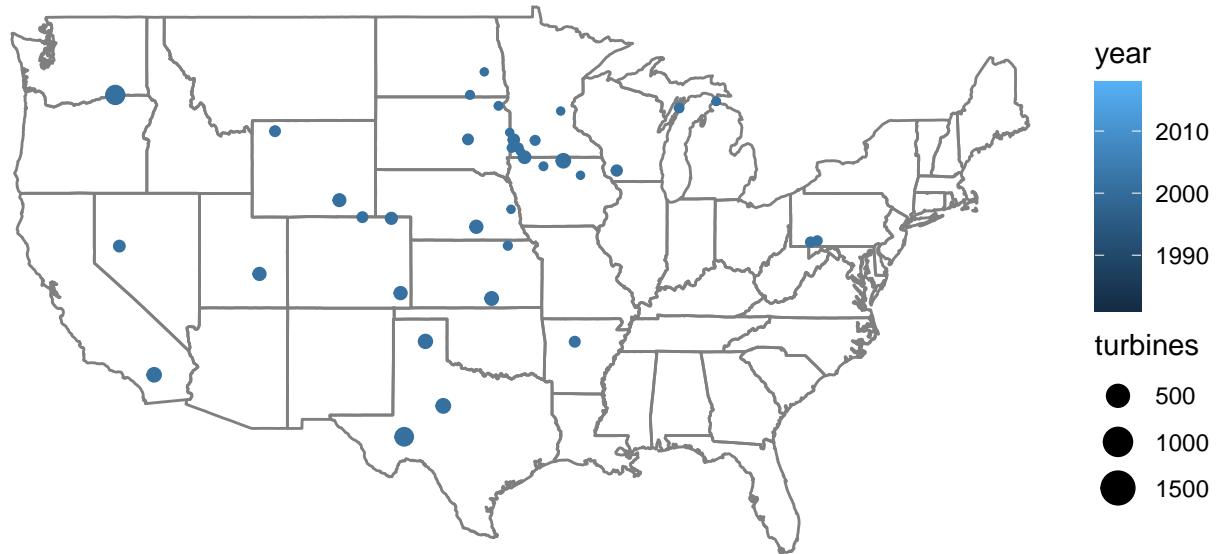
Year: 2001



Year: 2001



Year: 2002



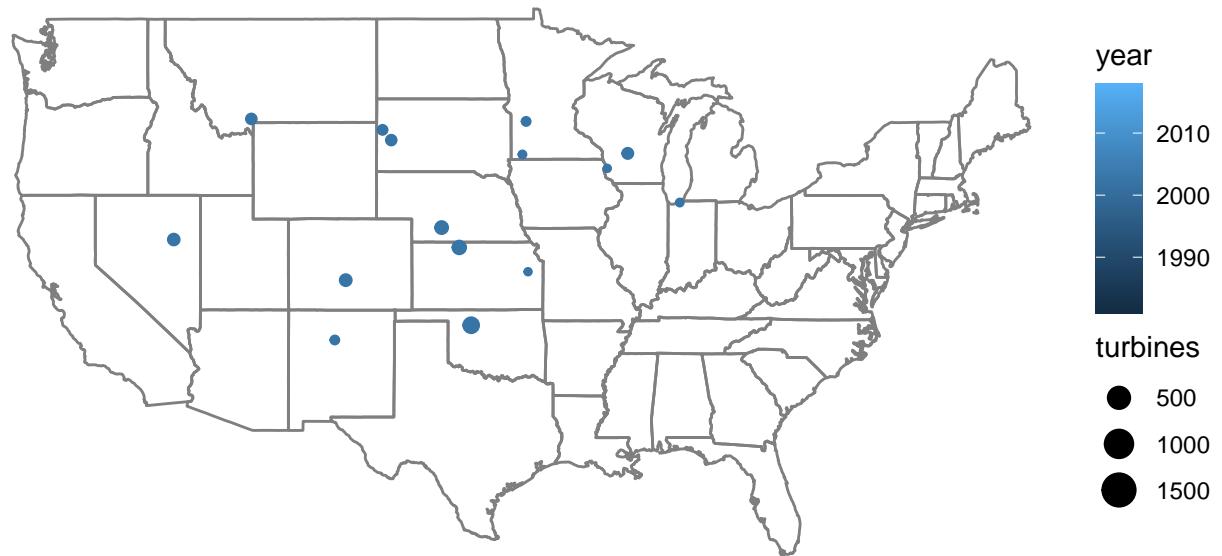
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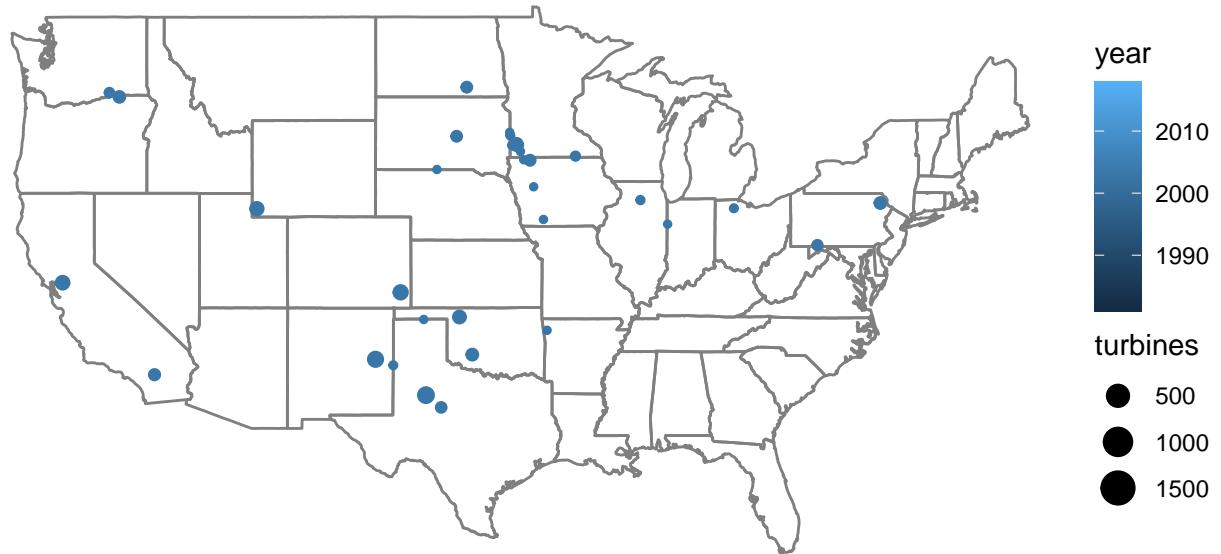
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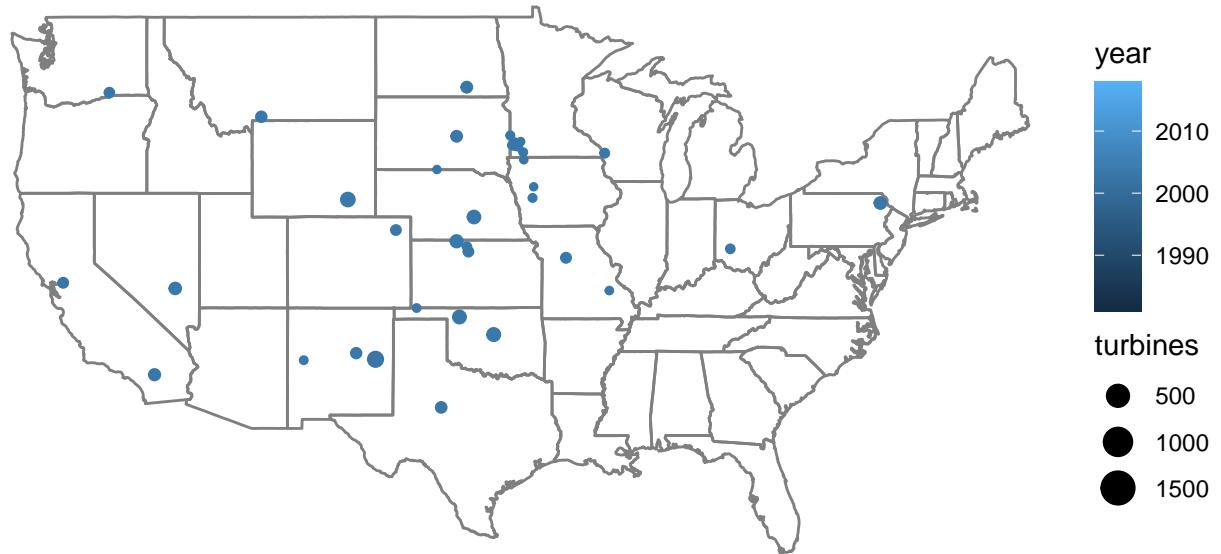
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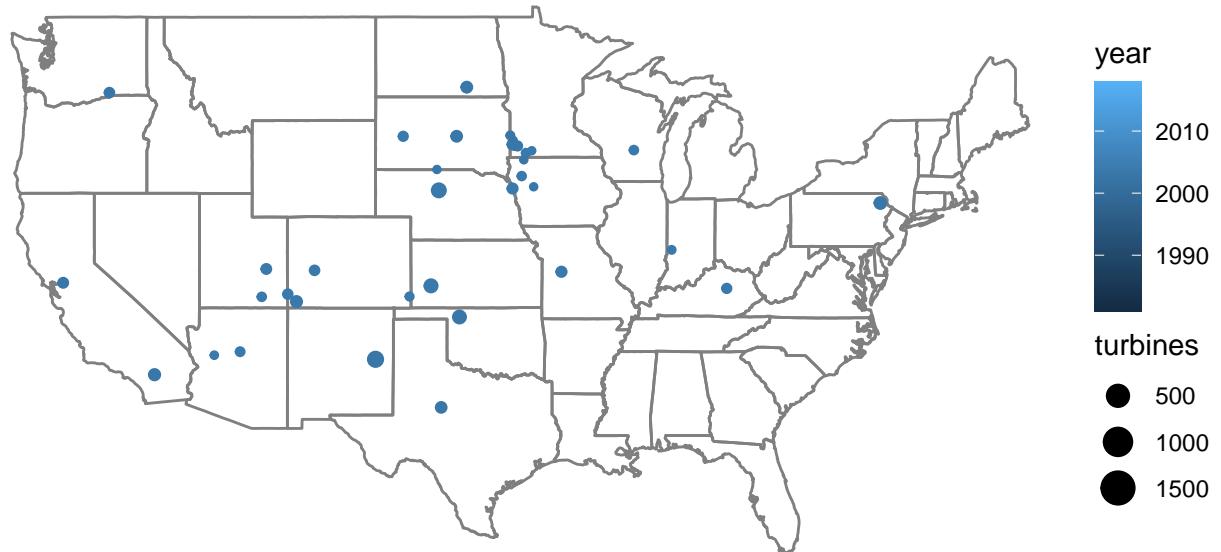
Year: 2003



Year: 2003



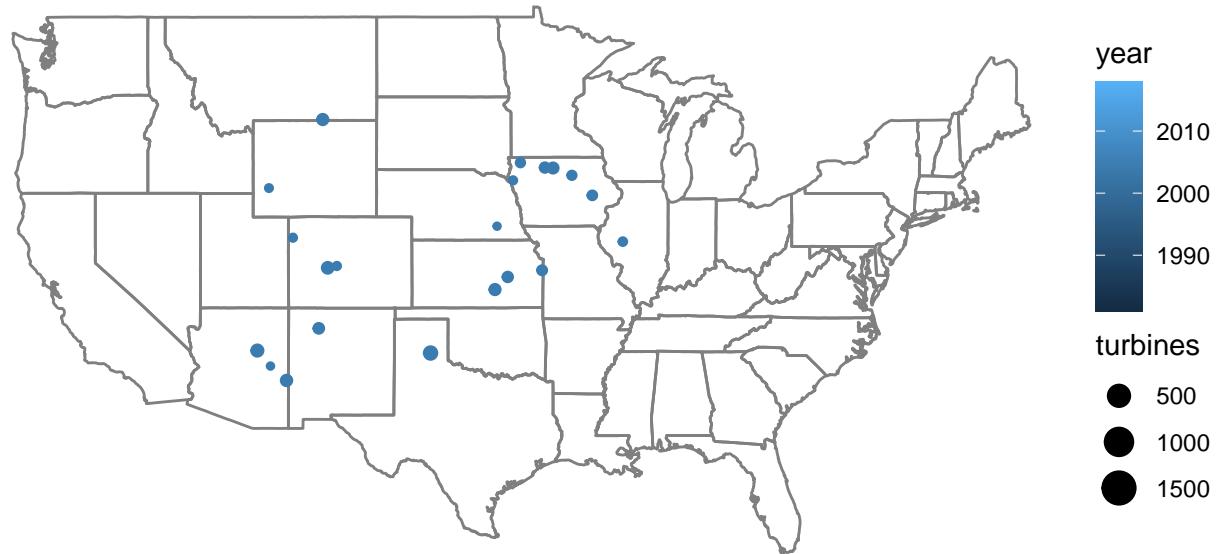
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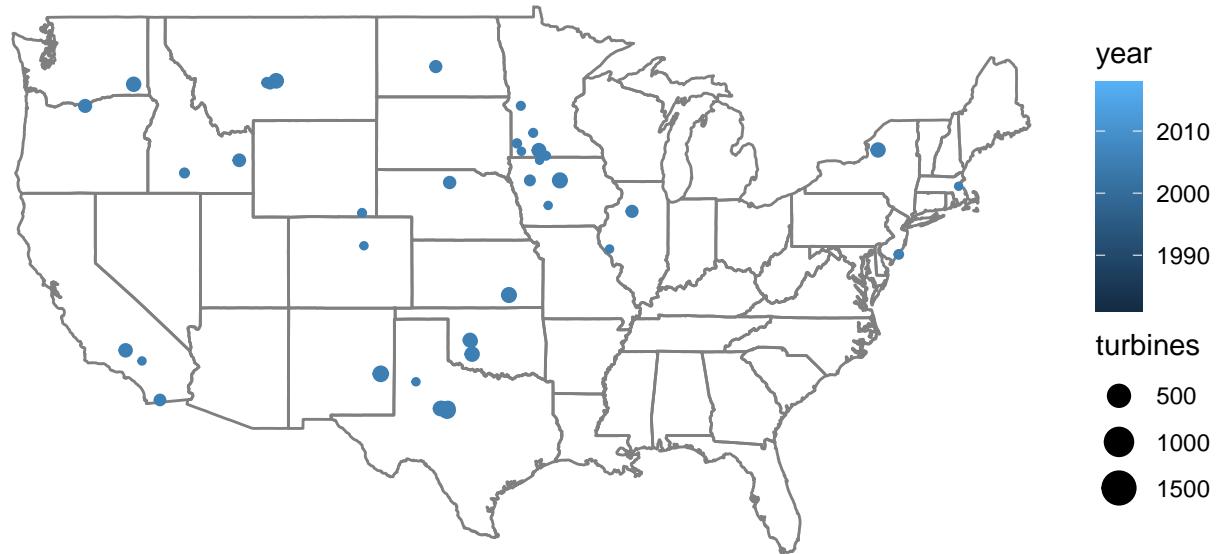
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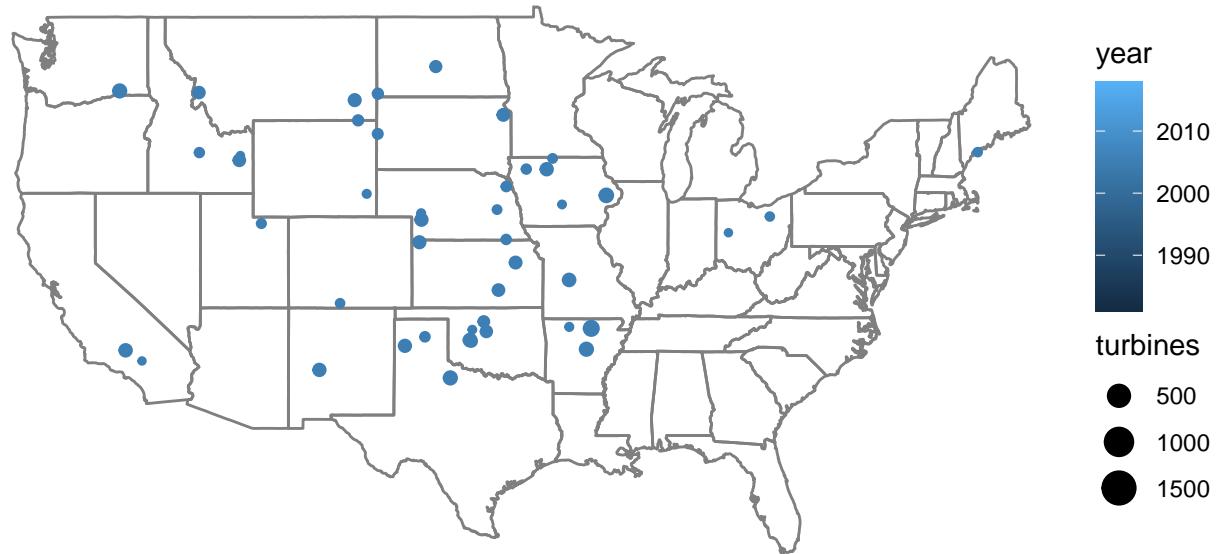
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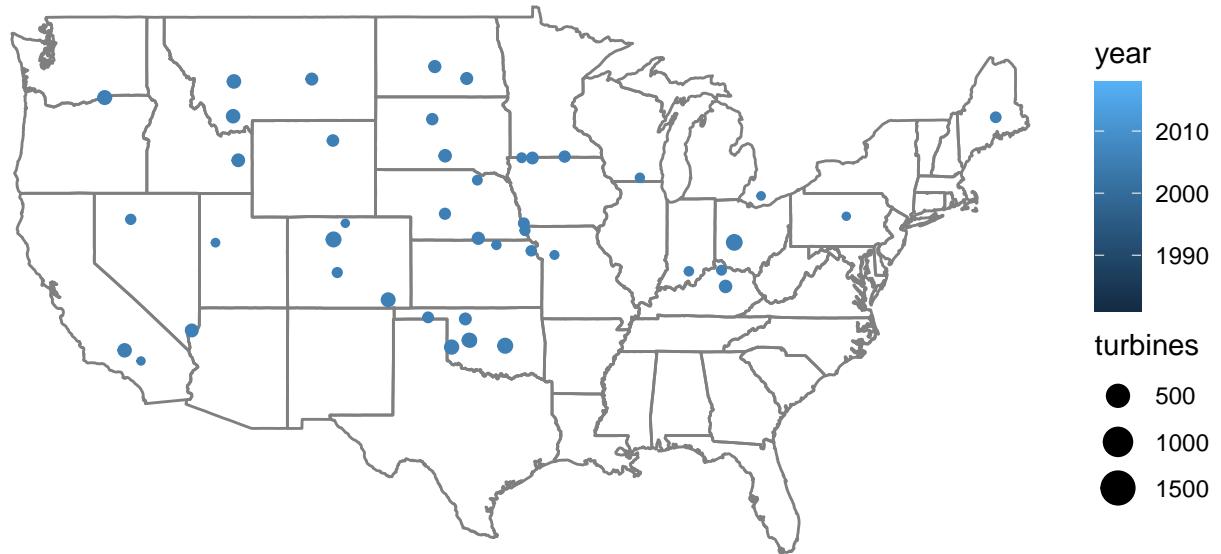
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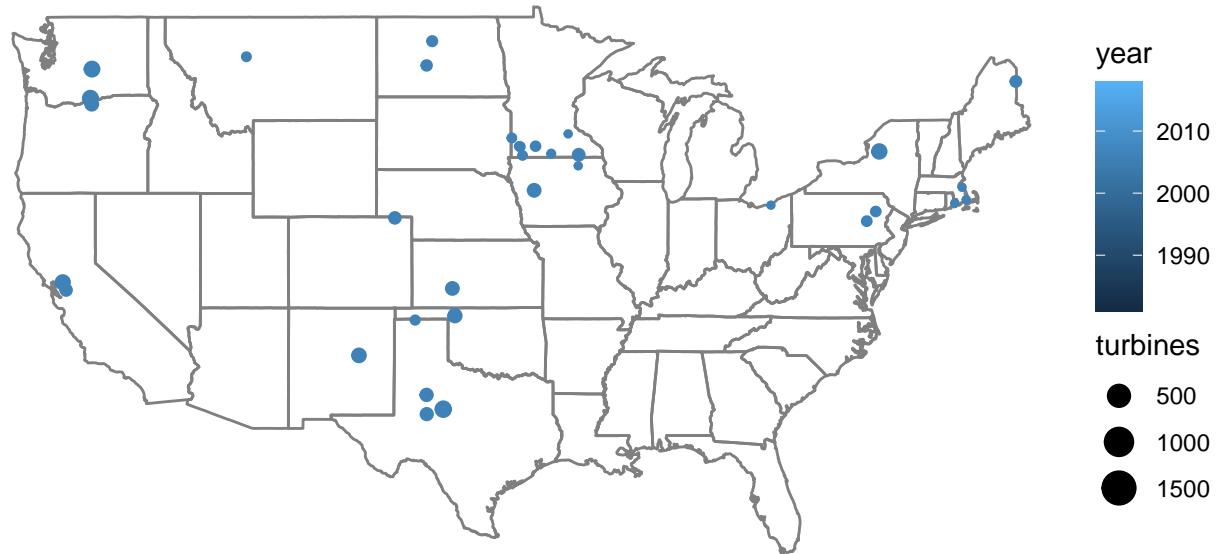
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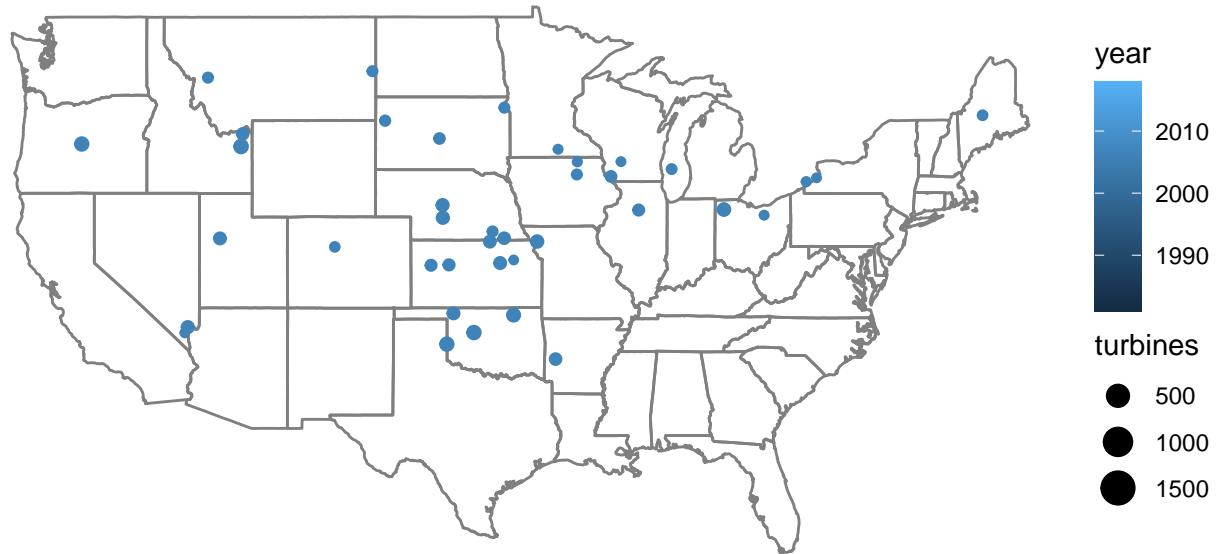
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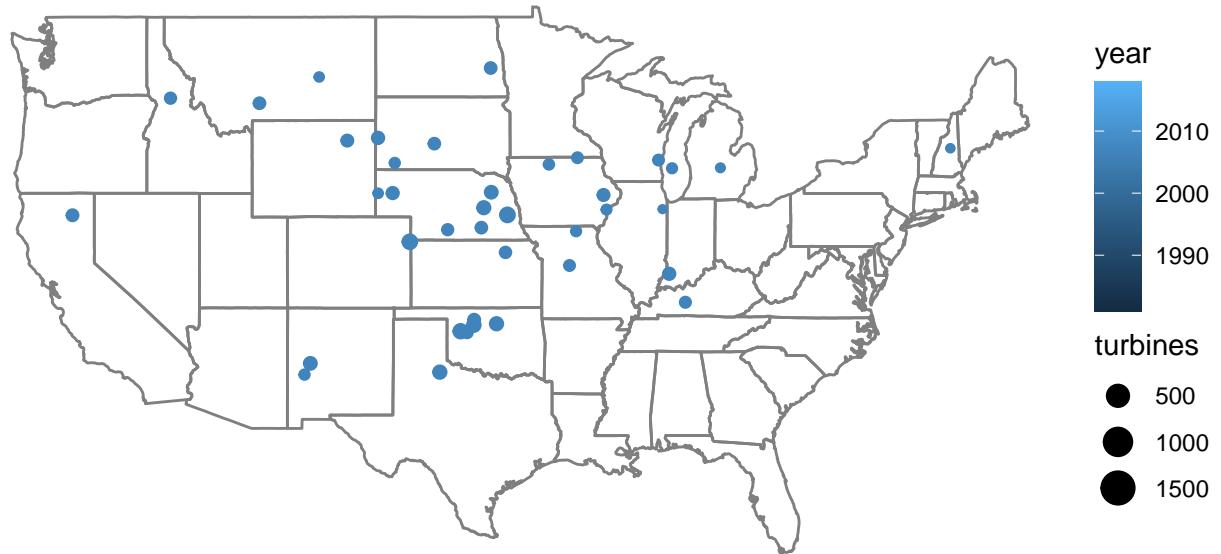
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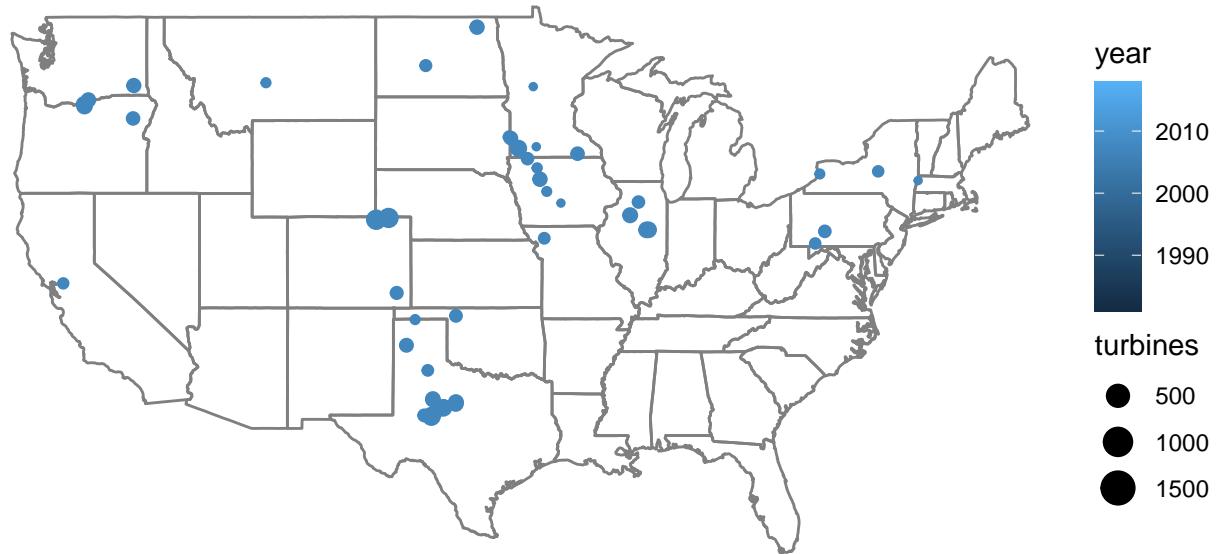
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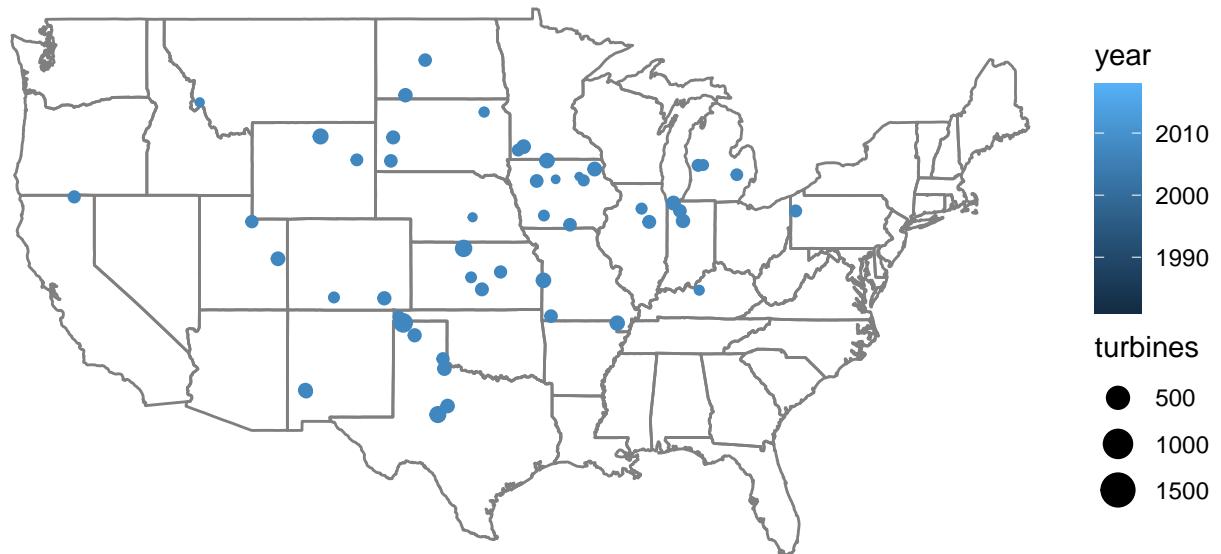
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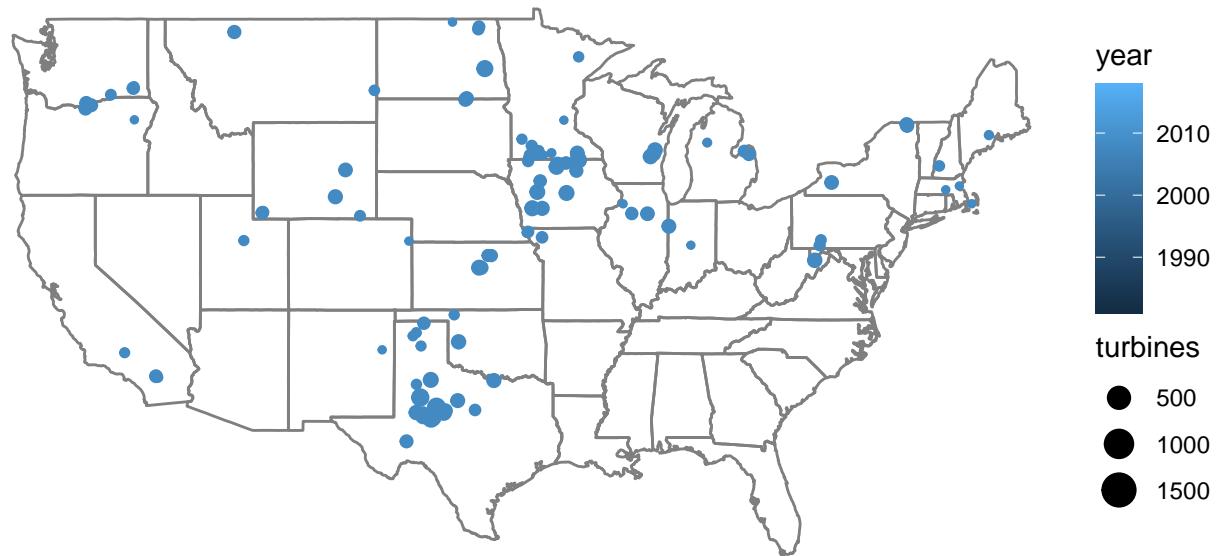
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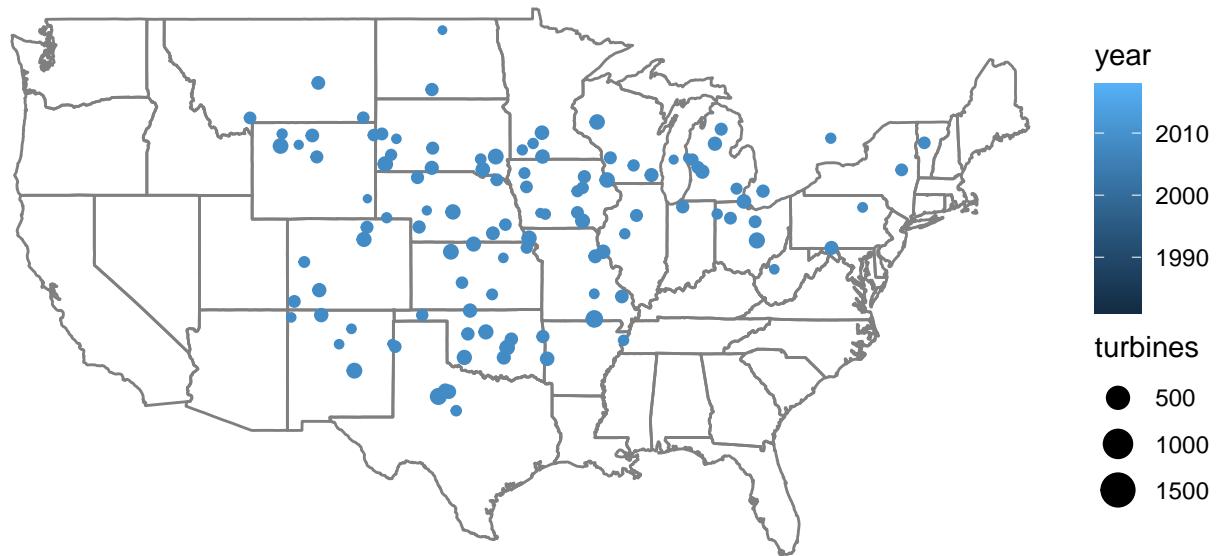
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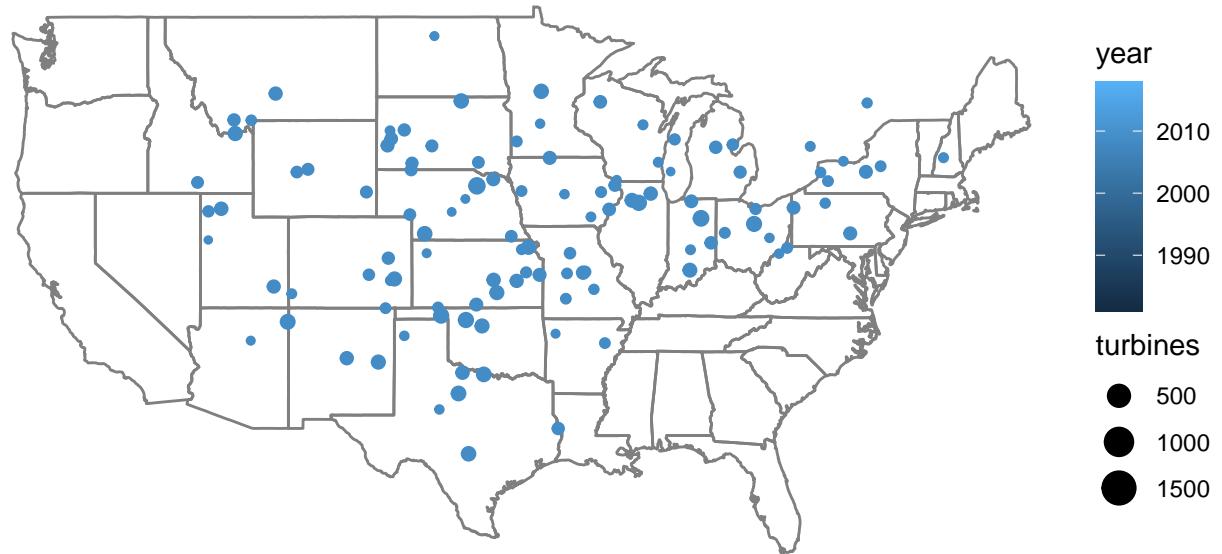
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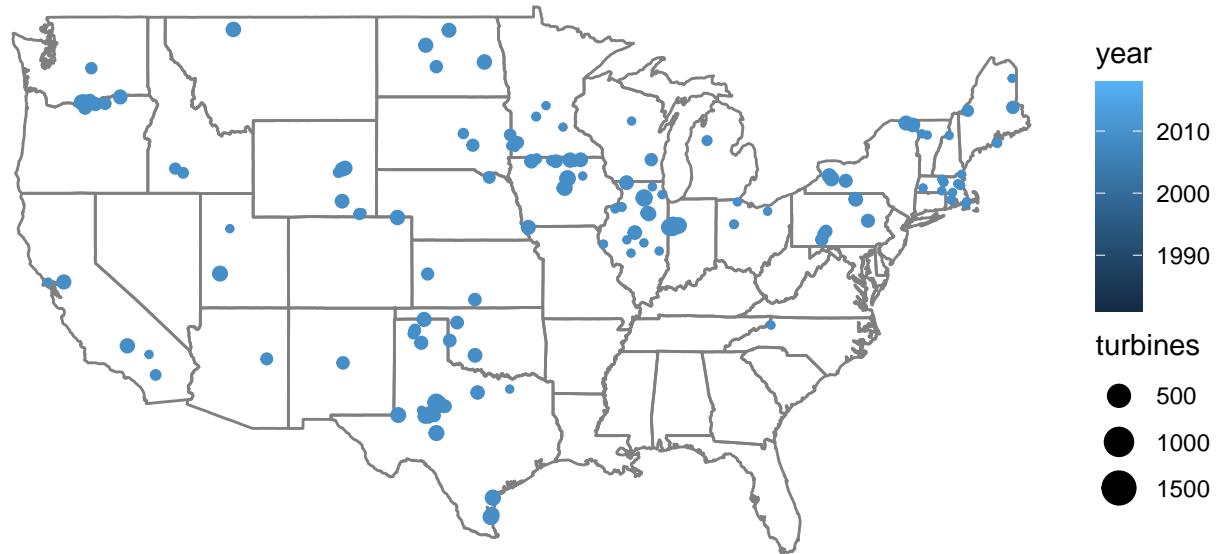
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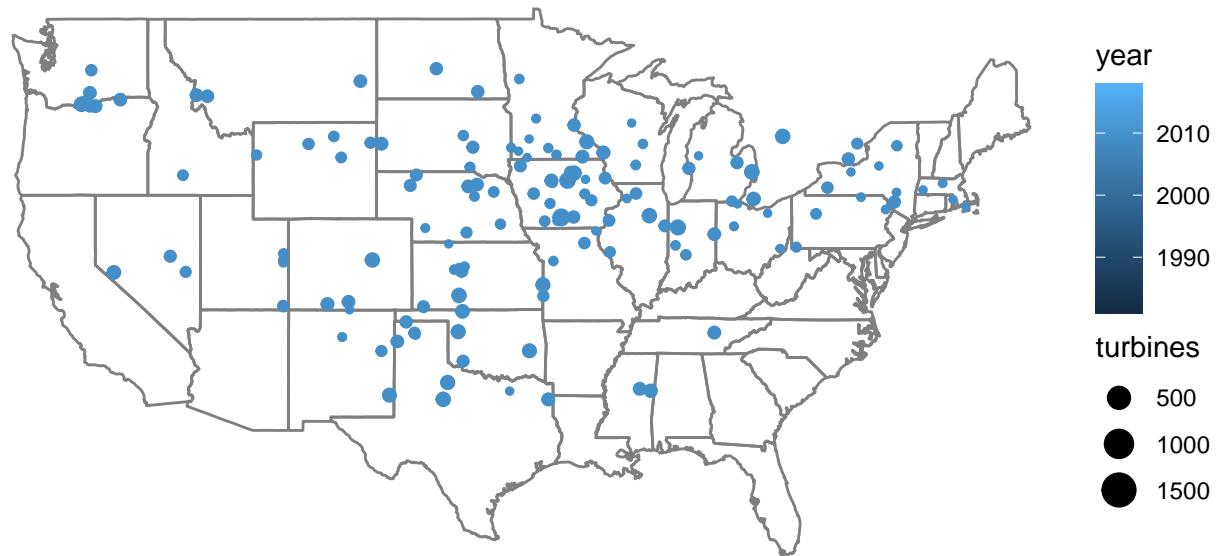
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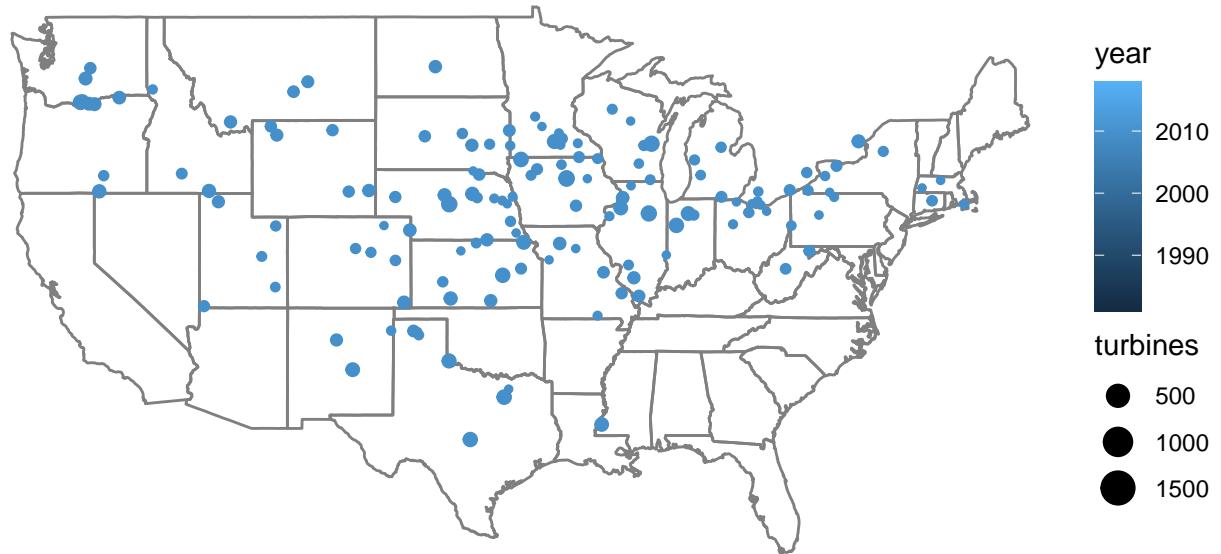
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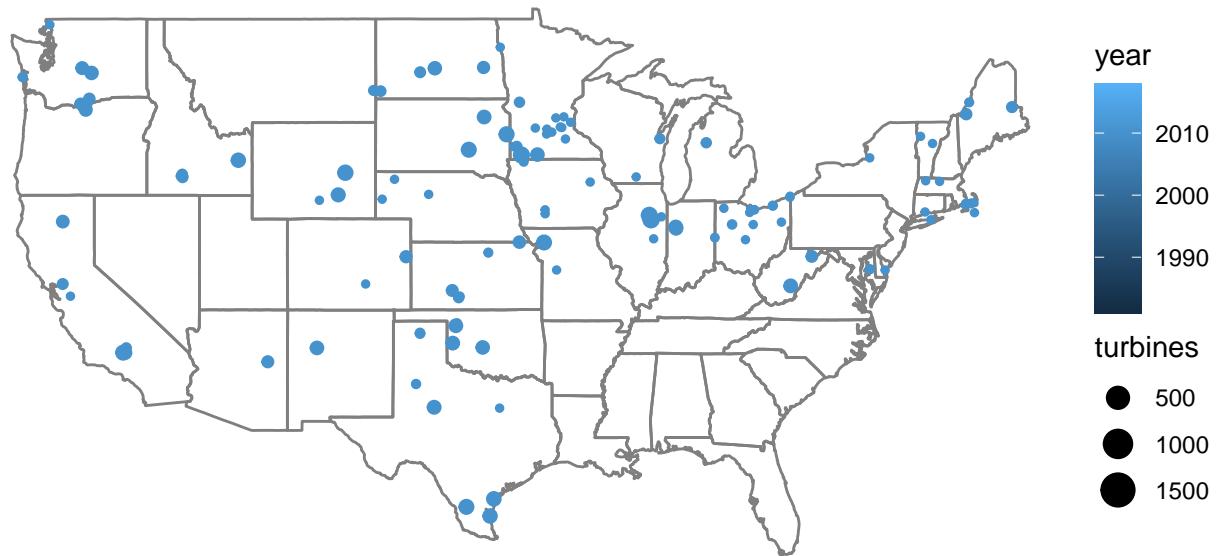
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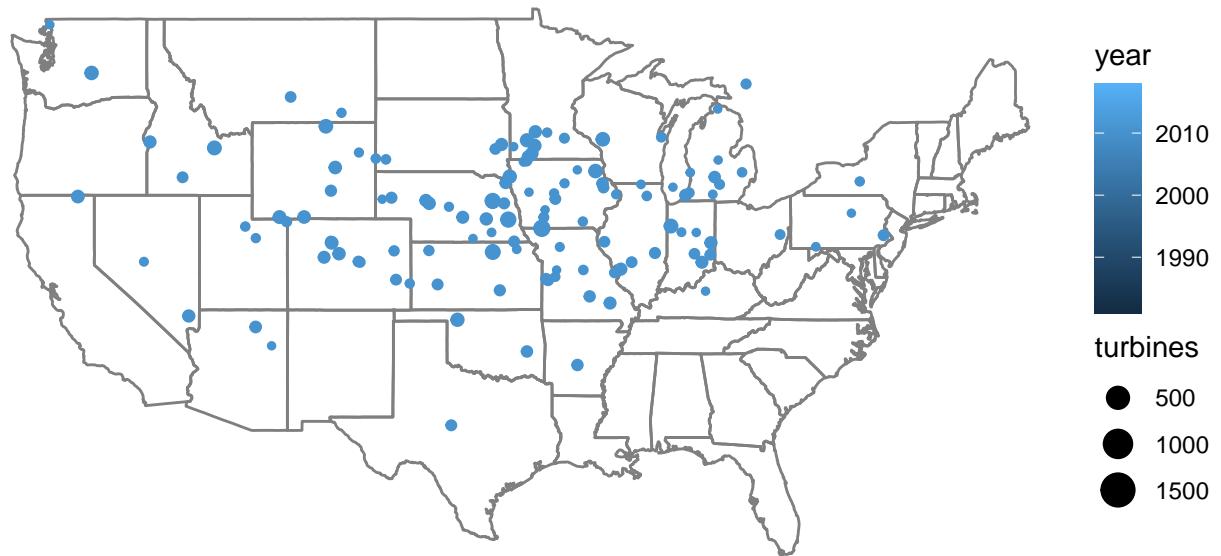
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Year: 2010



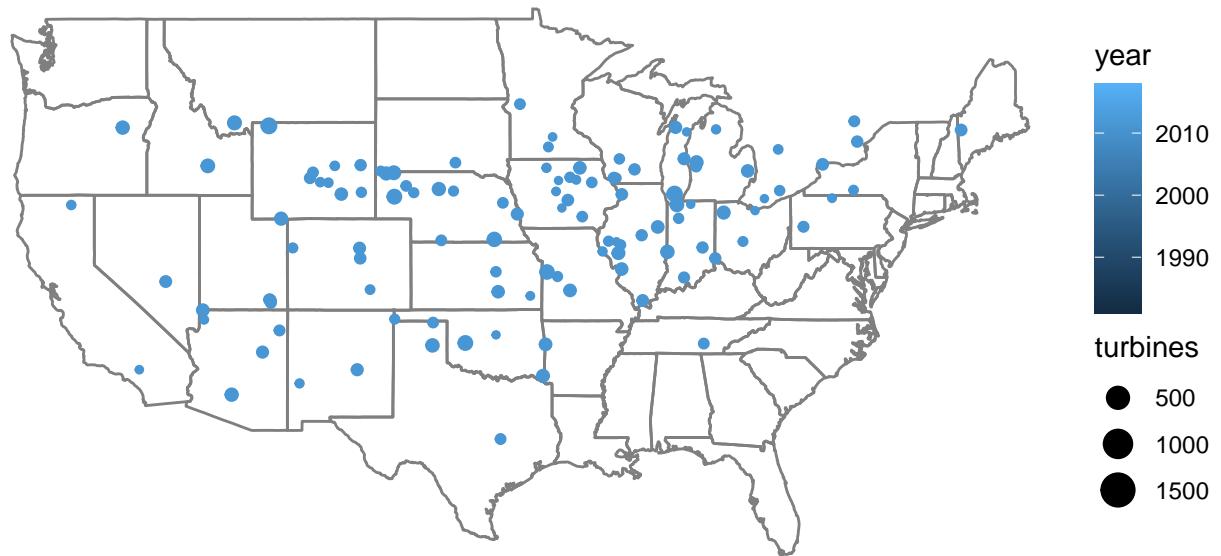
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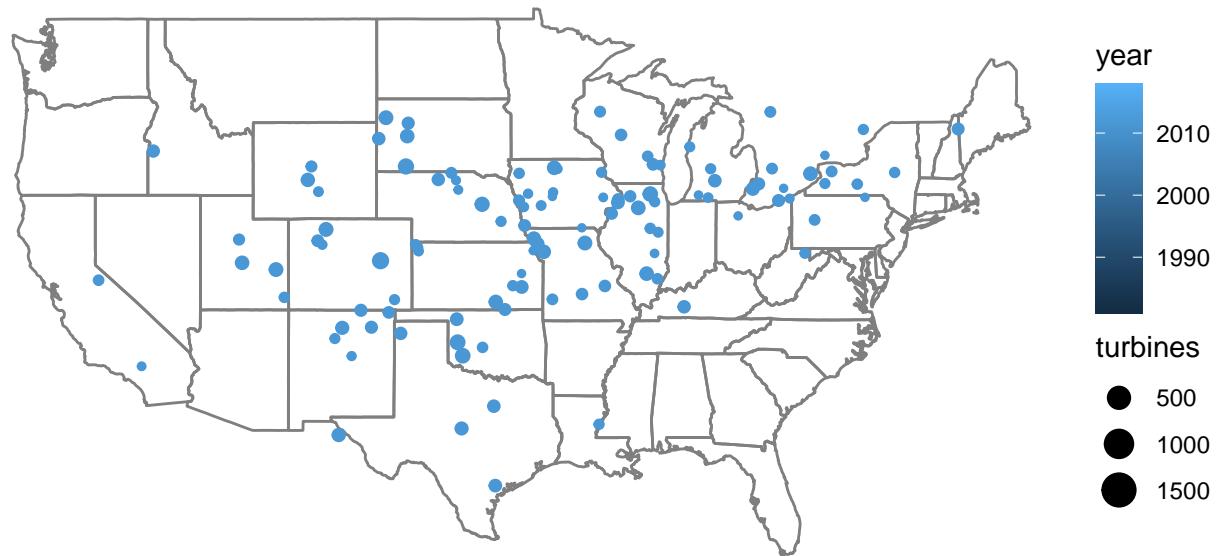
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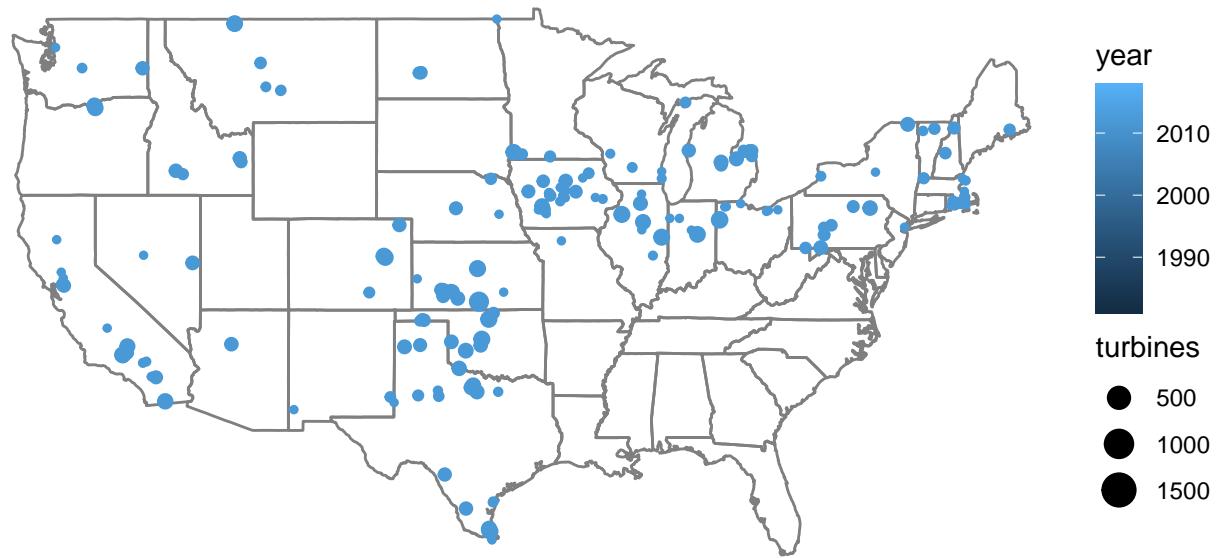
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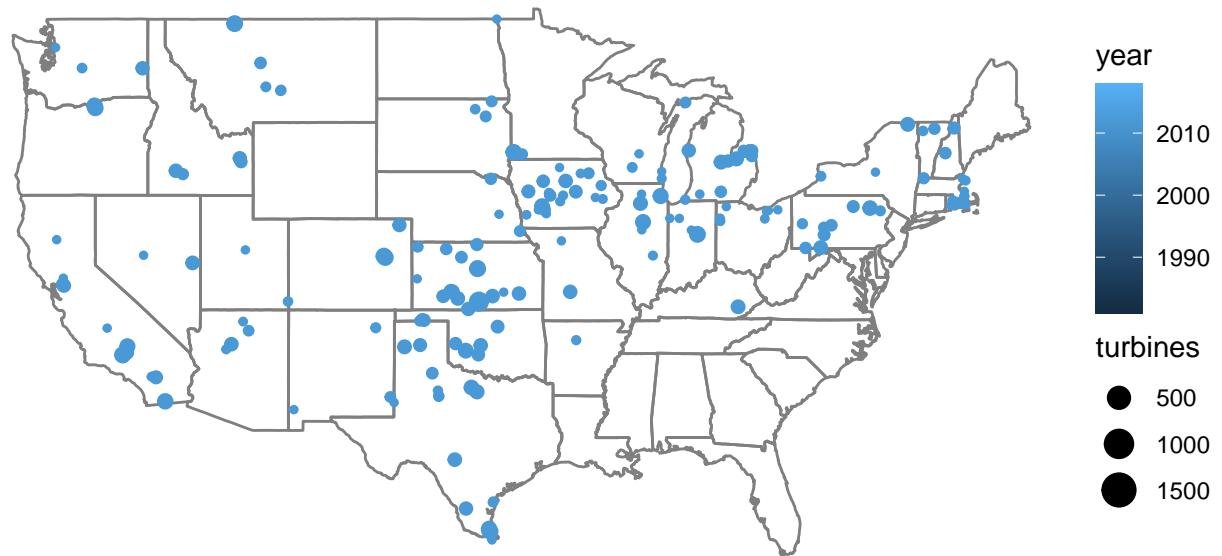
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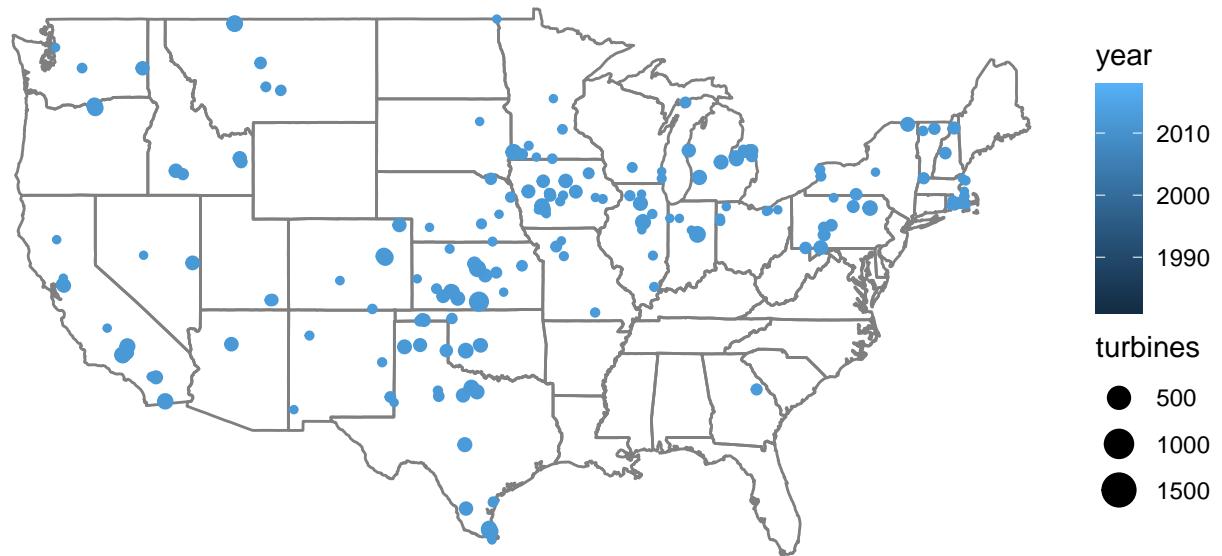
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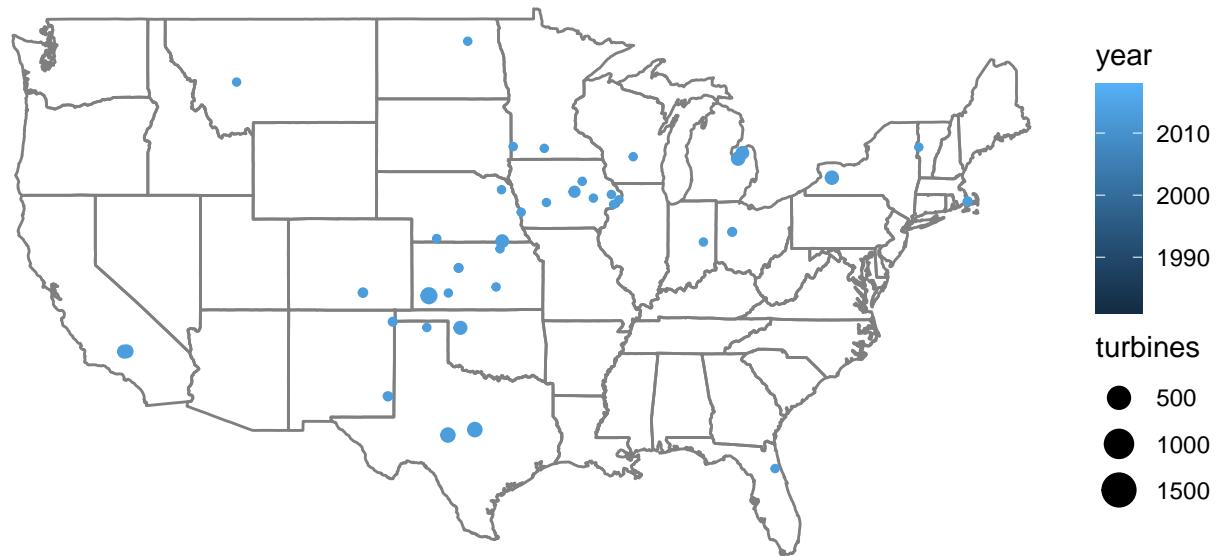
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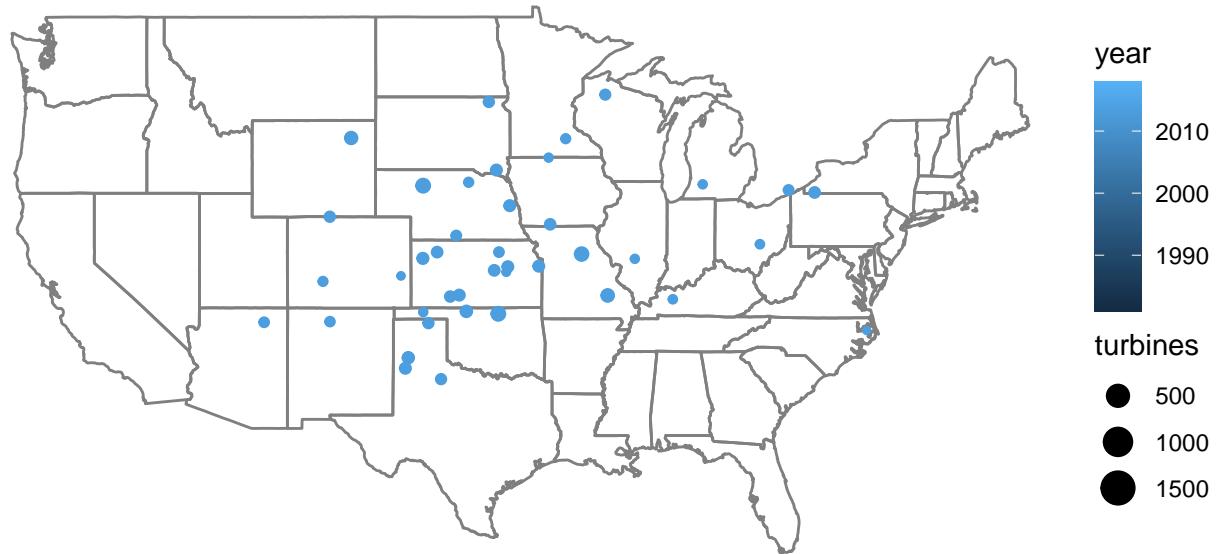
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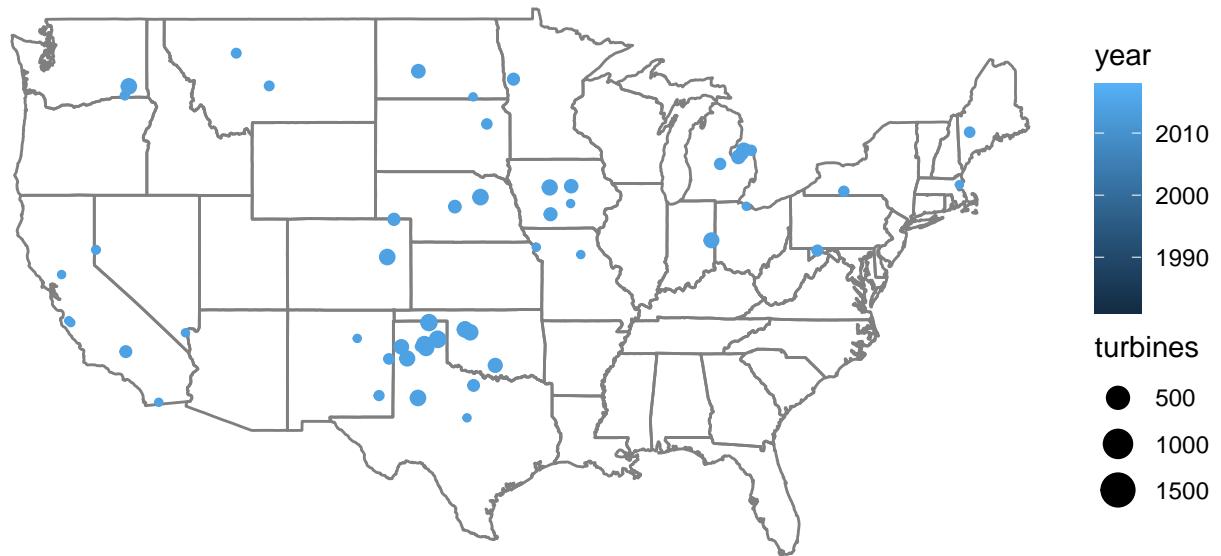
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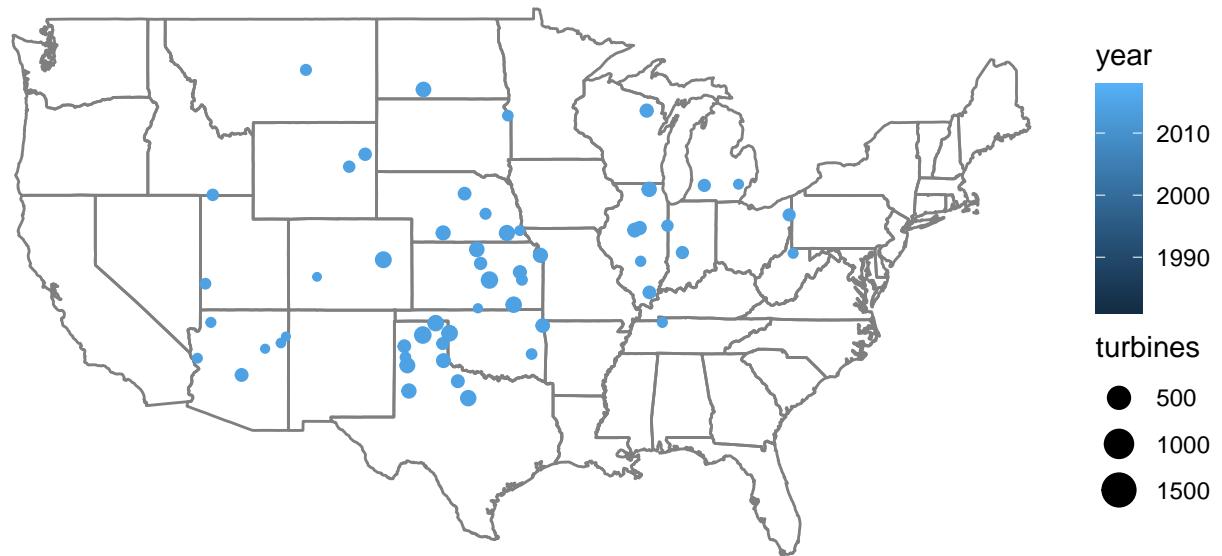
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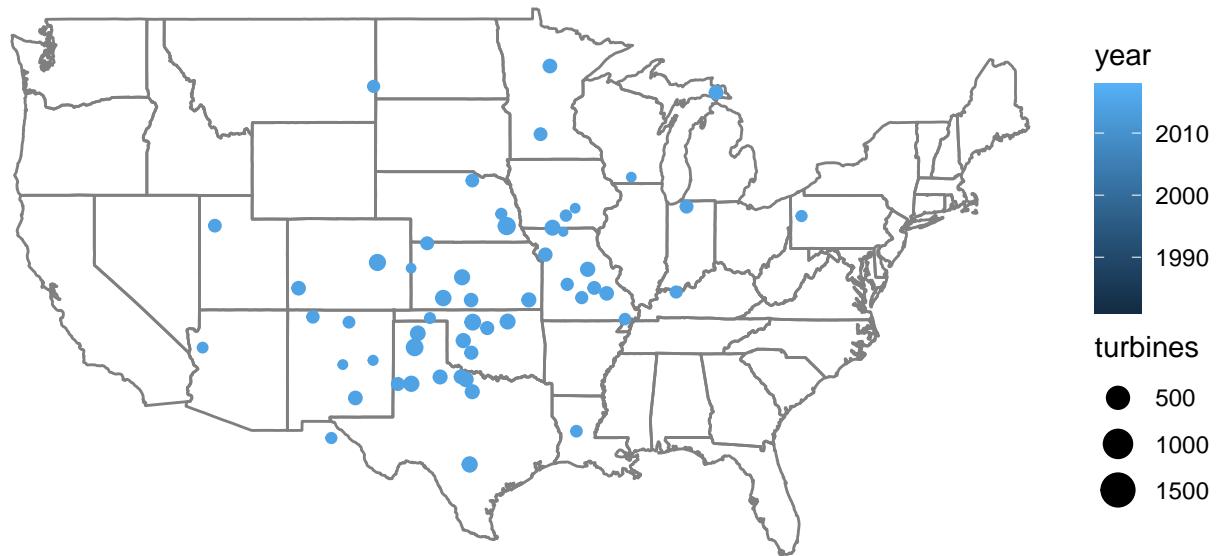
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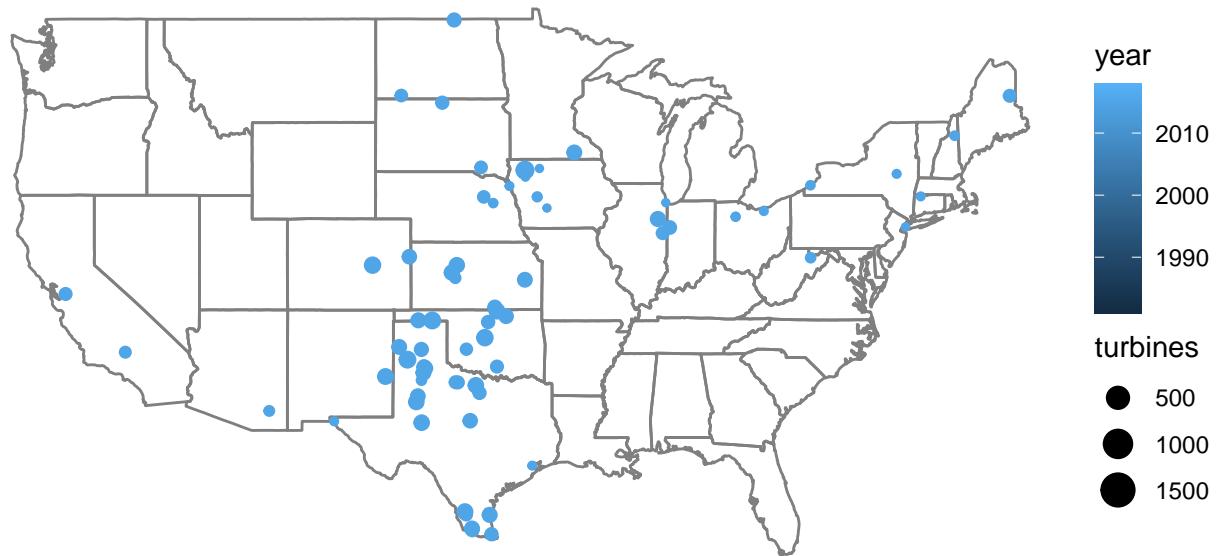
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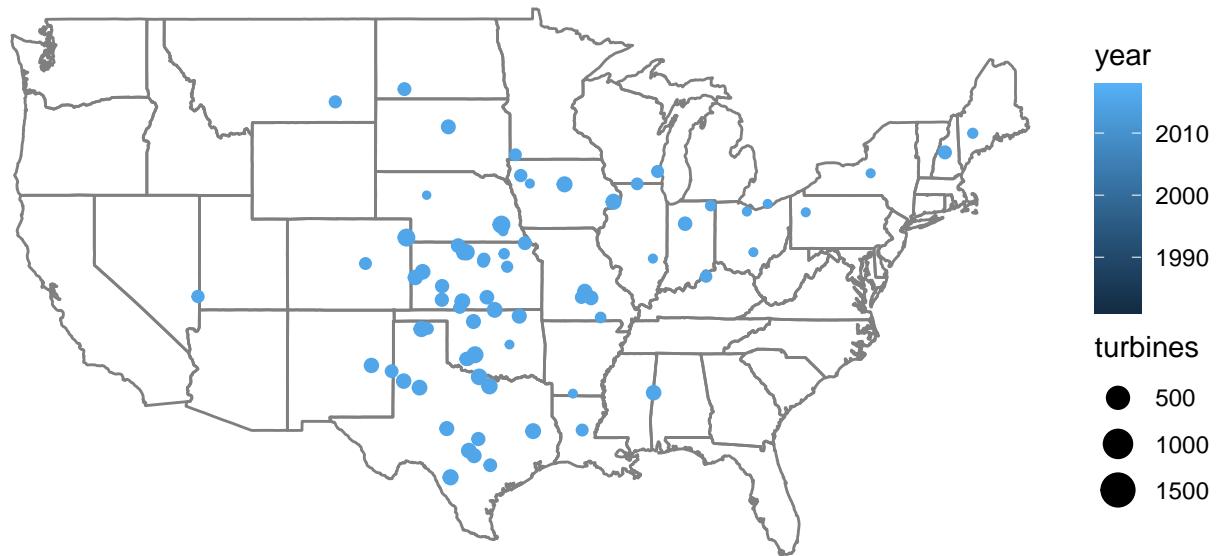
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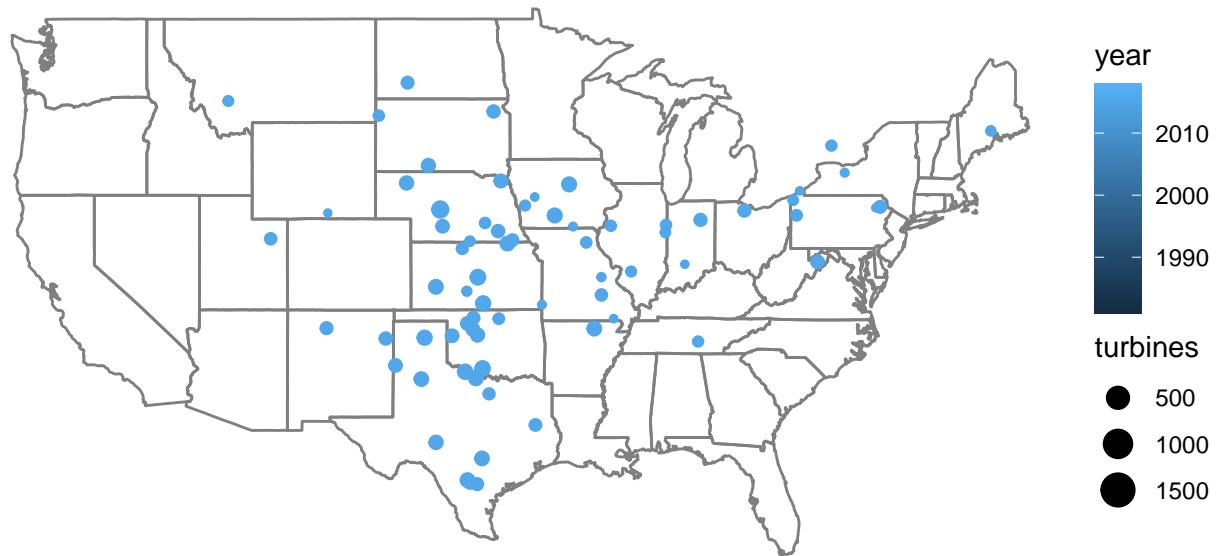
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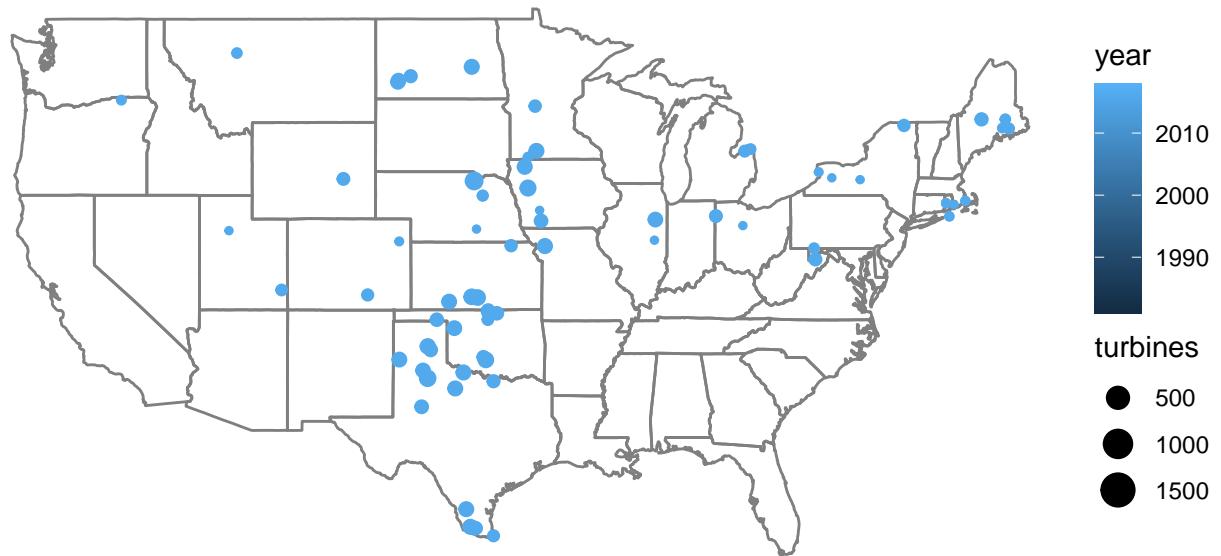
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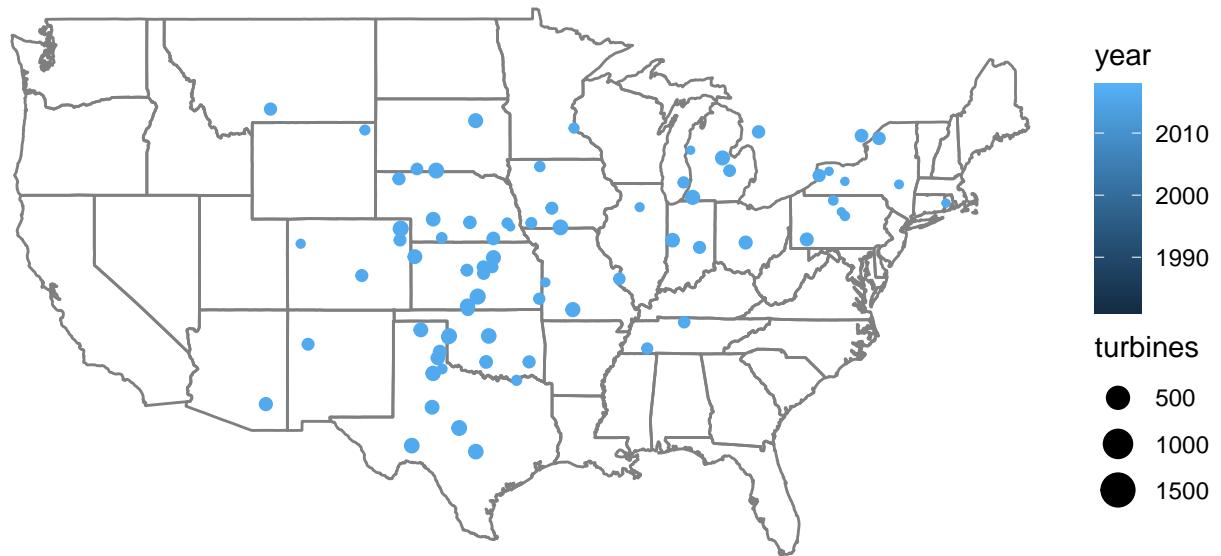
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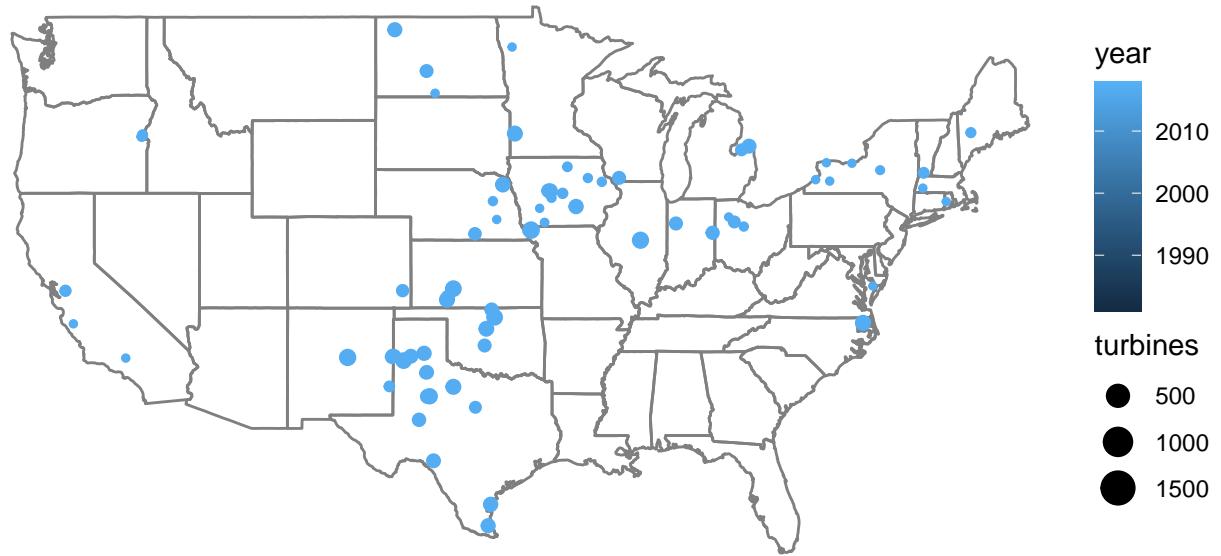
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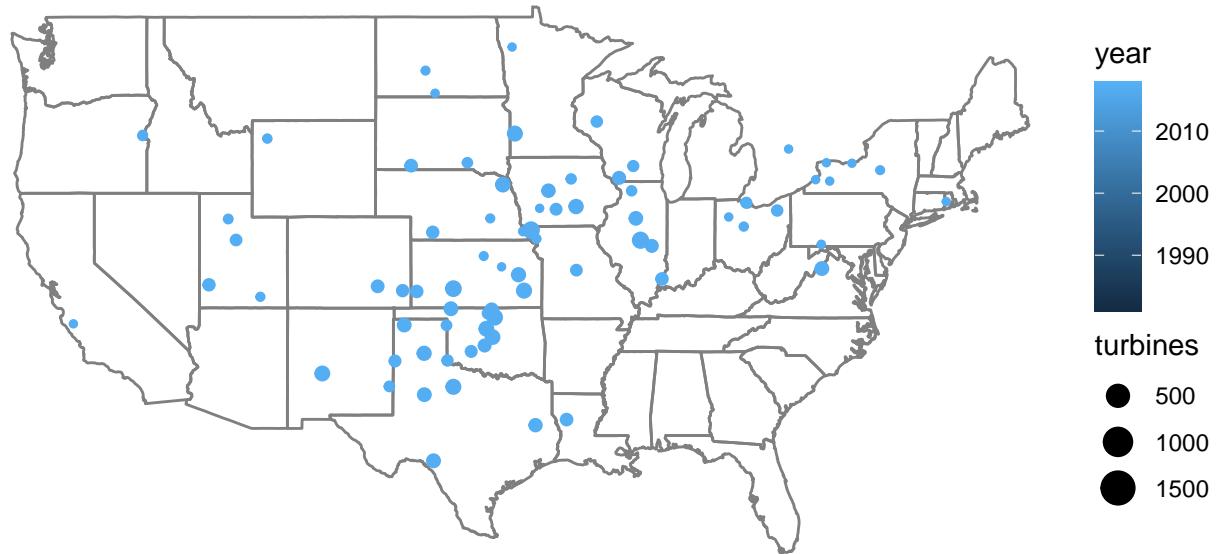
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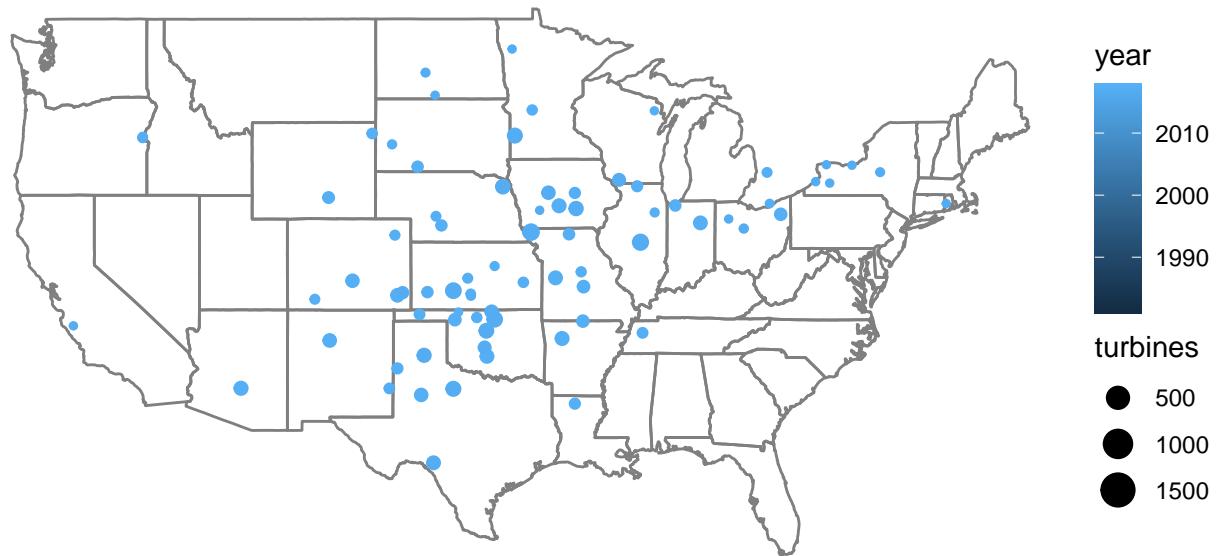
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Year: 2017



Year: 2018



Year: 2018

