

# spsurveyME2014

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**spsurveyMaine: select 30 Kennebec county lakes > 150 acres with an unstratified equal probability design**

## Initial Setup

load the packages needed for the analysis.

## Introduction

Sample design document for Kennebec county lakes > 150 acres. Linda Bacon provided a shapefile with the lakes and asked for an unstratified equal probability design that includes 30 lakes. We follow the 1st example in [Finite\\_Design.pdf](#) by Thomas Kincaid to use the R package spsurvey to conduct a GRTS survey designs for a finite resource. All data and code for this project are available on [github](#).

## Data

The sample frame was provided by Linda Bacon as a shapefile with 39 lakes greater than 150 acres in Kennebec County. The shapefile is in NAD\_1983\_UTM\_Zone\_19N. The first step is reproject to albers equal area. Then the spatialPolygonsDataFrame must be converted to a spatialPointsDataFrame.

## spsurvey GRTS unstratified, equal probability design

The finite resource used in the designs is lakes>150acres in Kennebec county Maine. We use the R package “spsurvey” to develop unstratified, equal probability design for up to 30 lakes. The set.seed function is called so that, if necessary, the designs can be replicated.

## Results

Below is a list of the selected sites. The siteIDs are assigned by SPsurvey. The idea is that you select the sites in order of the siteIDs. If a site cannot be visited for any reason choose the next site from the list. There is also a rough figure showing all of the lakes as polygons and the selected lakes as the blue centroids.

##	siteID	GNIS_ID	GNIS_Name	AreaSqKm	acres
## 1	Site-01	00564618	Crowell Pond	0.8130000	200.7002
## 2	Site-02	00570303	Long Pond	2.0400000	503.6425
## 3	Site-03	00564126	Cobbosseecontee Lake	22.4364064	5540.4661
## 4	Site-04	00570551	Lower Togus Pond	2.0870000	515.3314
## 5	Site-05	00573060	Pattee Pond	2.1180000	522.9497

## 6	Site-06	00577064	Threemile Pond	4.7550000	1174.2066
## 7	Site-07	00581480	Pocasset Lake	2.4418662	603.0217
## 8	Site-08	00577060	Threecornered Pond	0.7340000	181.3147
## 9	Site-09	00567171	Great Pond	44.9090000	11089.6349
## 10	Site-10	00578662	Woodbury Pond	2.0776986	513.0726
## 11	Site-11	00570445	Lovejoy Pond	1.5370000	379.4416
## 12	Site-12	00577636	Upper Narrows Pond	0.9680000	238.9620
## 13	Site-13	00565669	East Pond	6.9530000	1716.8809
## 14	Site-14	00565081	Dexter Pond	2.8633539	707.1045
## 15	Site-15	00572994	Parker Pond	6.1710000	1524.0290
## 16	Site-16	00577212	Torsey Lake	2.7500000	679.1289
## 17	Site-17	00565857	Ellis Pond	2.8119633	694.3615
## 18	Site-18	00561261	Androscoggin Lake	16.2871667	4022.1721
## 19	Site-19	00572394	North Pond	9.0669677	2238.9505
## 20	Site-20	00565769	Echo Lake	4.9990000	1234.3949
## 21	Site-21	00570443	Lovejoy Pond	1.5360000	379.2727
## 22	Site-22	00564788	David Pond	1.2210000	301.4571
## 23	Site-23	00563951	China Lake	15.9520000	3938.9409
## 24	Site-24	00577161	Togus Pond	2.7310000	674.4360
## 25	Site-25	00572090	Nehumkeag Pond	0.7260000	179.3660
## 26	Site-26	00562092	Berry Pond	0.7076248	174.7466
## 27	Site-27	00561266	Annabessacook Lake	5.7300000	1415.0363
## 28	Site-28	00563569	Carleton Pond	0.9030000	222.8647
## 29	Site-29	00564139	Cochnewagon Lake	1.5960000	394.1764
## 30	Site-30	00576012	Spectacle Pond	0.6060000	149.5690

