fire-color: preview Data

identifying post-fire color changes in lakes of the western U.S.

Bella Oleksy et al.

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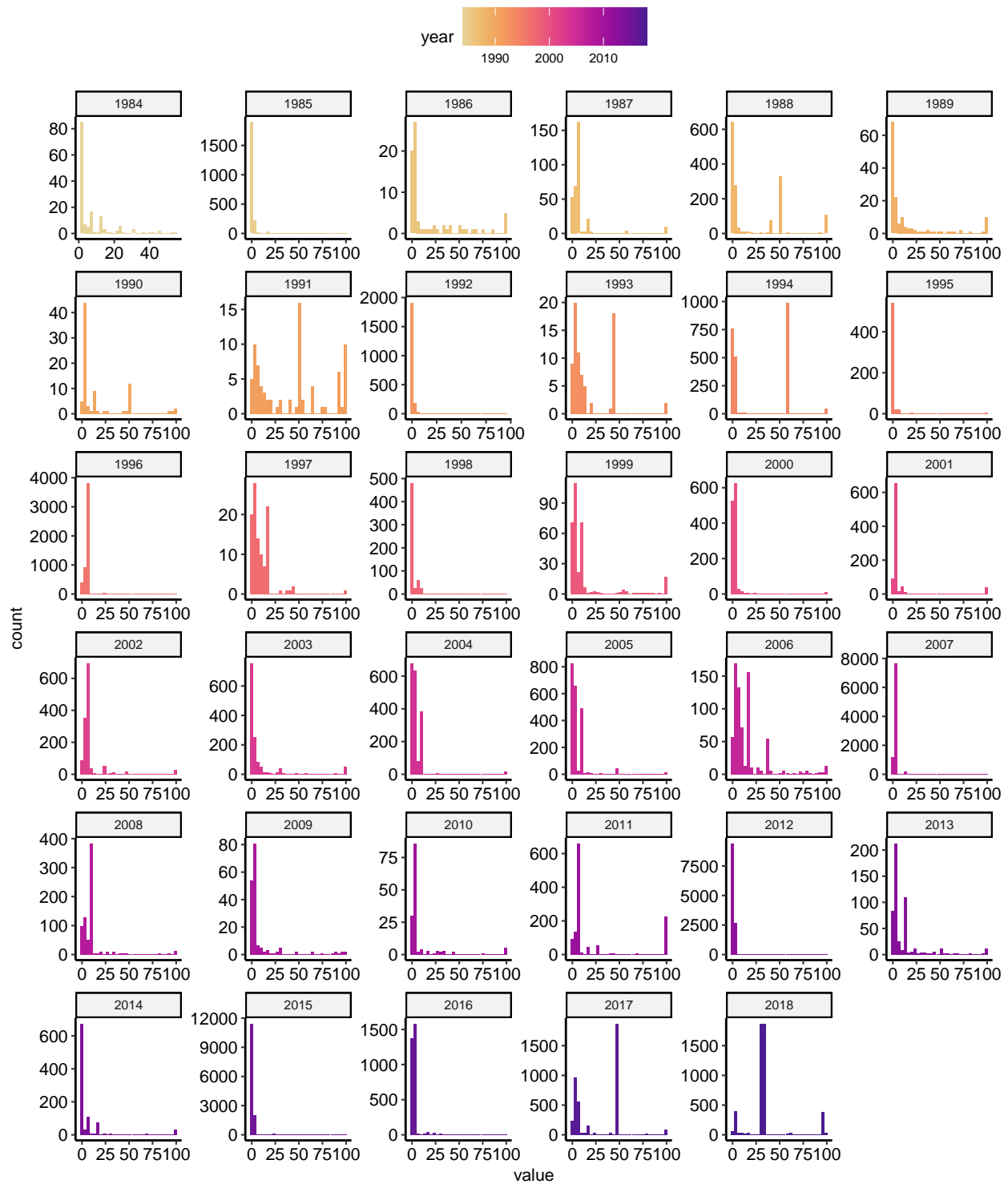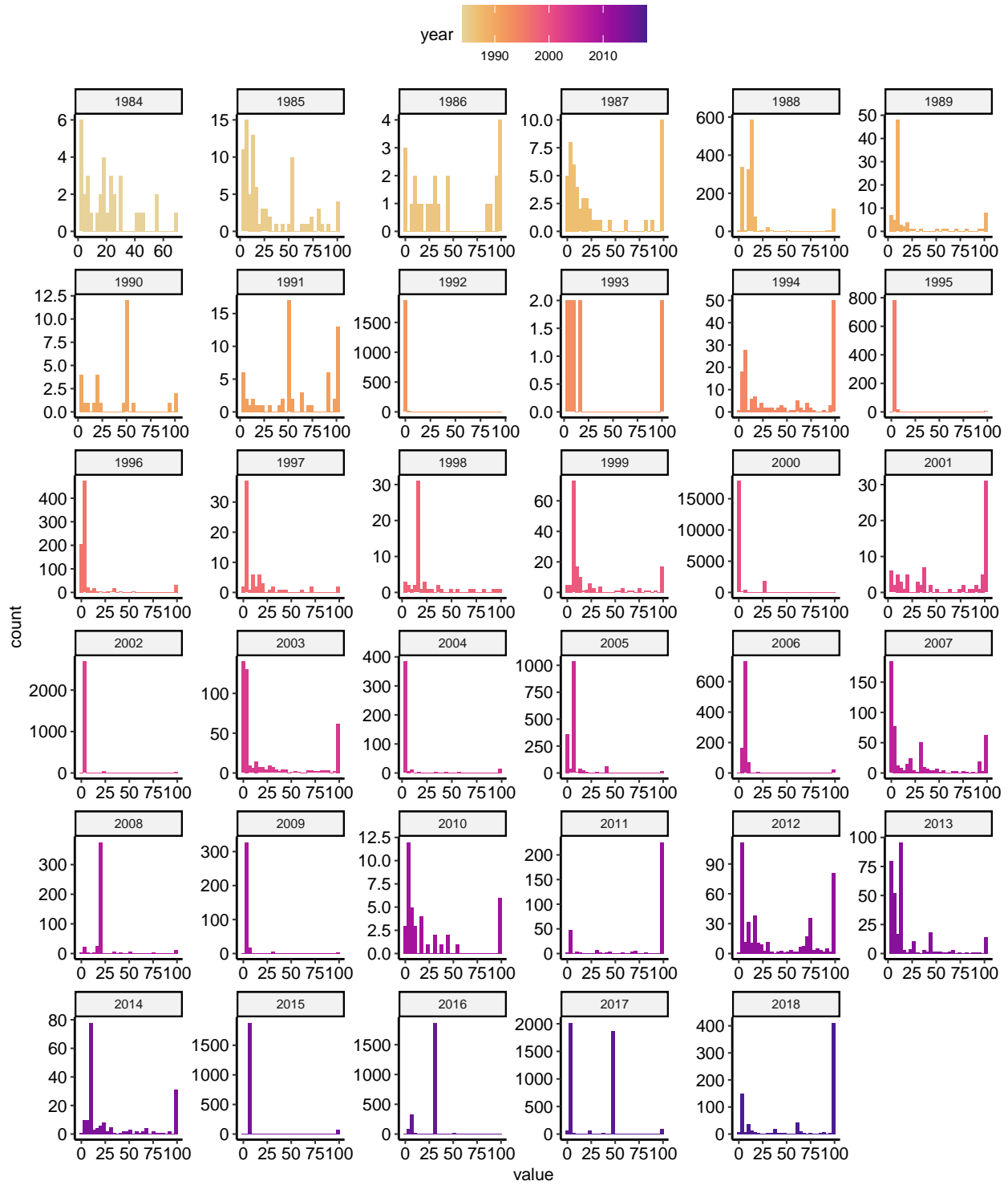
Contents

1 MTBS

1.1 Histograms of % area burned by Ws and Cat scales

MTBS % area burned – Ws scale

MTBS % area burned – Cat scale (local)

In every year there are always a number of lakes that burn severly (>90% of the total area of every local catchment. If you look at the full watershed (Ws) scale there are a lot more lakes on the low end (<20%).

Table 1: Table summarizing the number of lakes with any percentage burn (>1%) at the local catchment (Cat) and full watershed (Ws) scale, by year

year	n_lakes_Cat	n_lakes_Ws
1984	24	51
1985	41	87
1986	21	42
1987	39	72
1988	242	291
1989	41	70
1990	14	31
1991	42	57
1992	33	65
1993	7	32
1994	108	168
1995	25	53
1996	98	168
1997	25	42
1998	26	56
1999	56	99
2000	98	154
2001	74	144
2002	80	137
2003	162	248
2004	39	74
2005	80	111
2006	111	200
2007	159	247
2008	76	135
2009	34	53
2010	31	52
2011	69	104
2012	207	301
2013	83	135
2014	97	139
2015	180	244
2016	59	109
2017	232	350
2018	136	225

Looks promising, we have hundreds of lakes lakes that were close to forests fires in every year and the numbers fluctuate quite a bit year-to-year.

Number of lakes in burned watersheds/local catchments
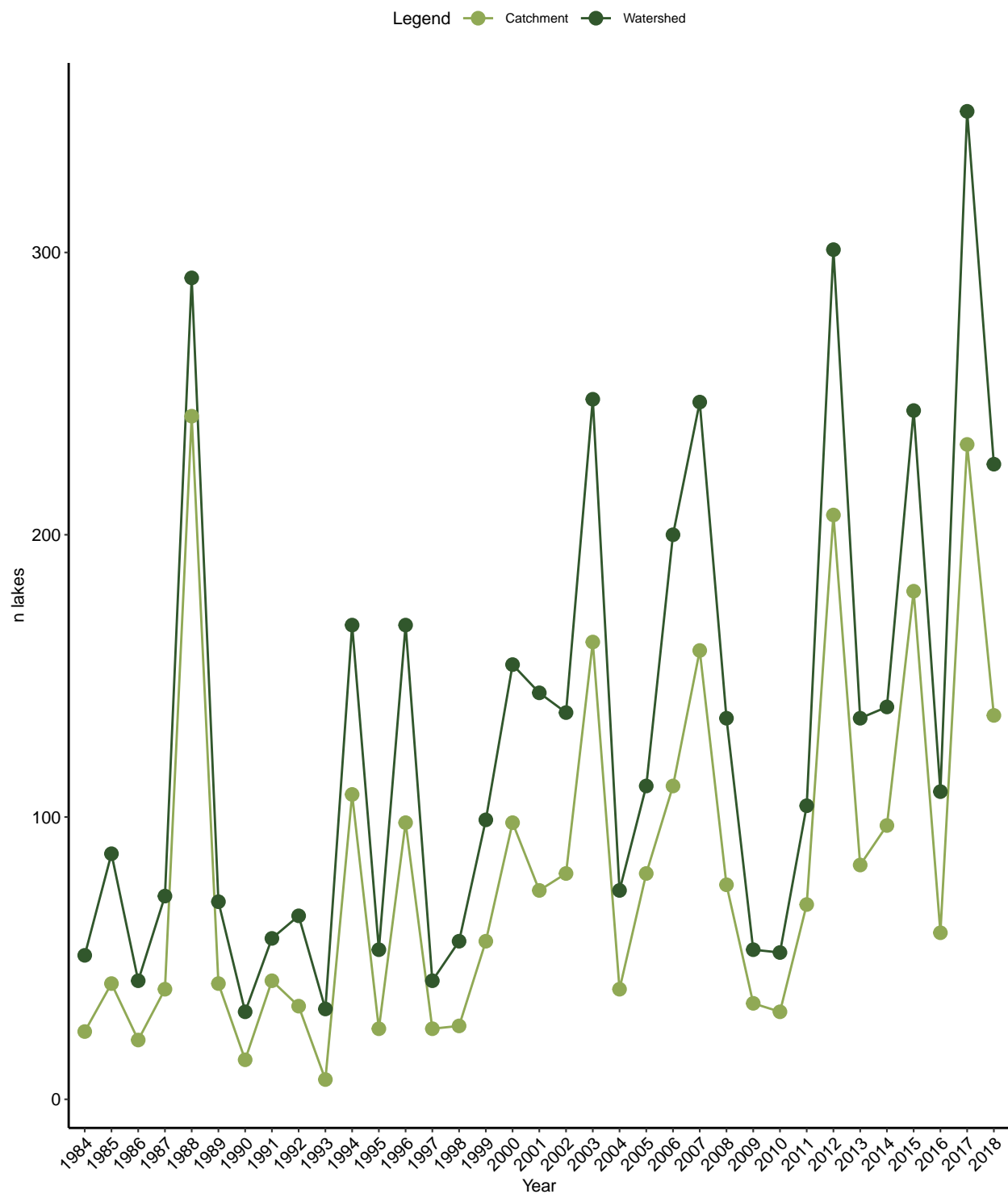
Looks like there is a step-change increase in the number of lakes in burned watersheds in the early 2000s, though no breakpoint detected using segmented regerssion.

```
##
## Call:
## lm(formula = n_lakes_Cat ~ year, data = MTBS_summary2)
```

```
## 
## Residuals:
##     Min     1Q Median     3Q    Max
## -75.14 -38.53 -11.91  17.60 196.33
## 
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept) -5418.2672  1918.2474  -2.825  0.00797 **
## year            2.7485     0.9586   2.867  0.00716 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 57.28 on 33 degrees of freedom
## Multiple R-squared:  0.1994, Adjusted R-squared:  0.1752
## F-statistic:  8.22 on 1 and 33 DF,  p-value: 0.007164

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### 1.1.1 Water color proof of concept

How many lakes do we have where the local catchment burned >90%? We think that is where we are most likely to see a color response if there is one.

Table 2: Table summarizing the number of lakes with any percentage burn (>90%) at the local catchment (Cat) and full watershed (Ws) scale, by year

year	n_lakes_Cat
1985	4
1986	6
1987	10
1988	126
1989	10
1990	2
1991	16
1992	2
1993	1

year	n_lakes_Cat
1994	48
1995	5
1996	33
1997	2
1998	3
1999	18
2000	19
2001	37
2002	34
2003	58
2004	8
2005	20
2006	25
2007	71
2008	17
2009	5
2010	6
2011	28
2012	82
2013	16
2014	32
2015	73
2016	6
2017	99
2018	42

We have a total of 964 lakes to check out.

Number of lakes where >90% of the local catchment burned
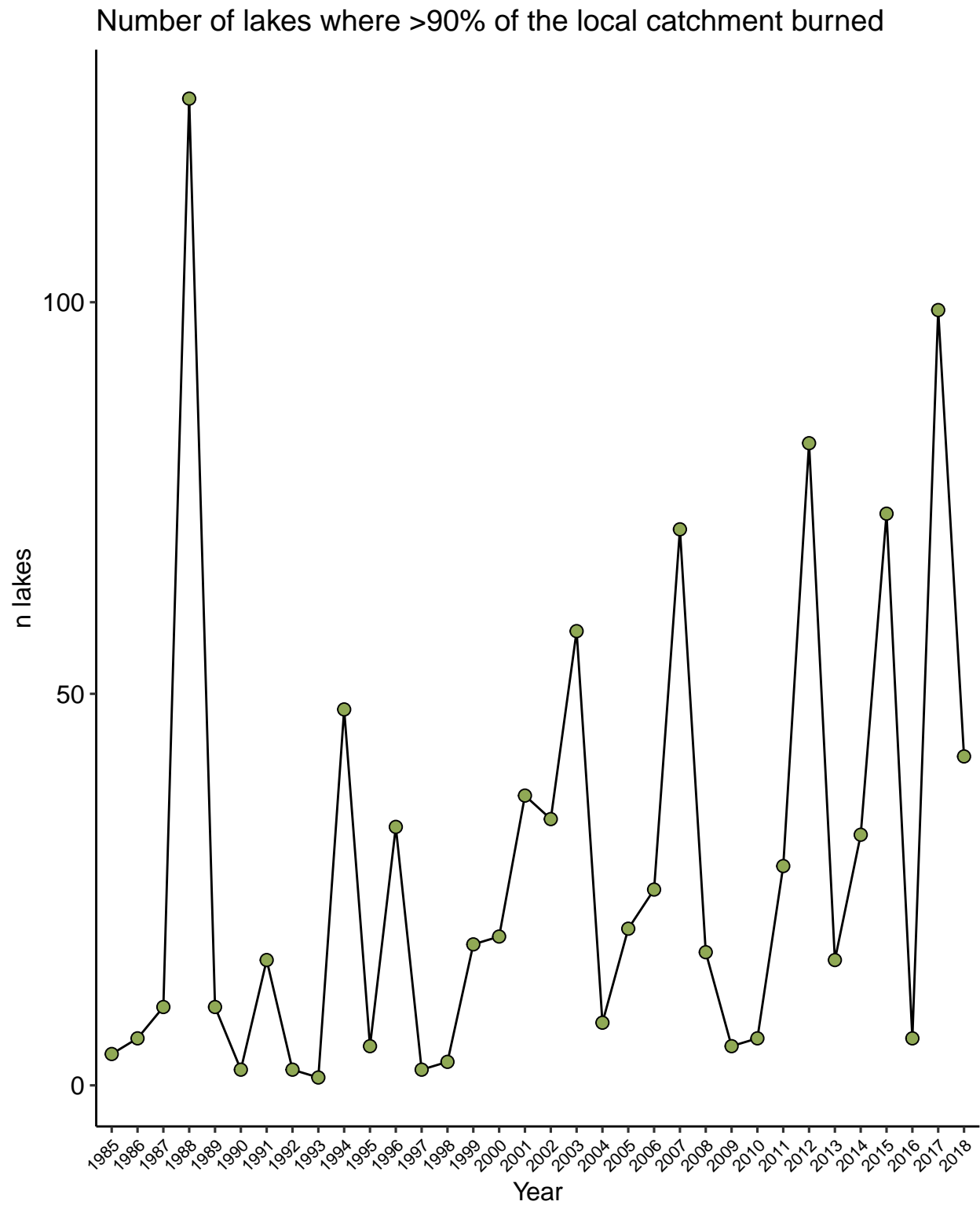
1.2 Write .csv file with comids for all lakes with fires