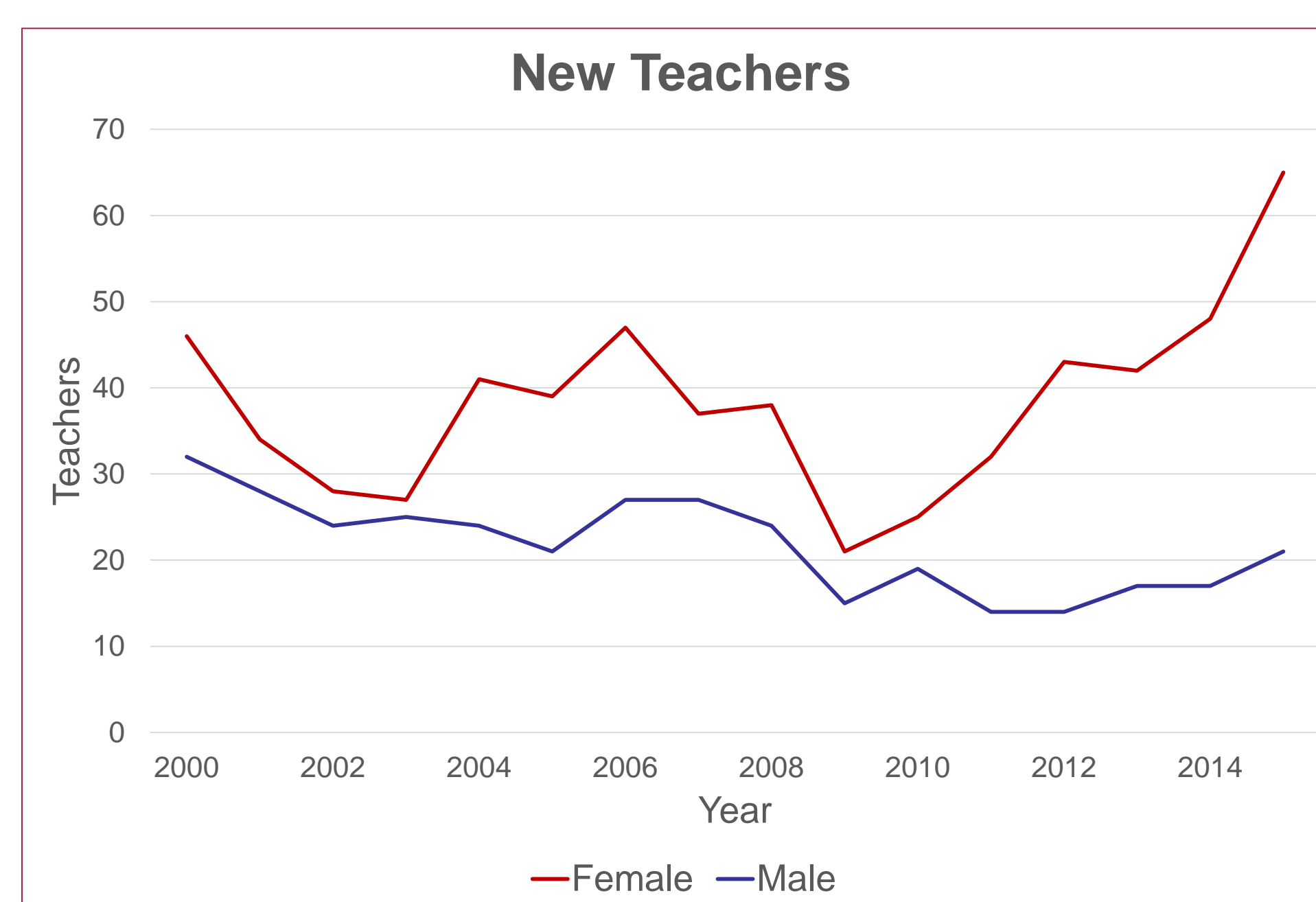


Gender and Agricultural Teacher Movement

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Introduction

A commonly suggested attrition rate for new K-12 teachers is 50% in the first five years however a national study of 1900 k-12 teachers using a cohort model (2007-2008) found that only 17% of these teachers left in the first five years (Gray, 2015). This is a substantial difference from the perception. When separated by gender male retention was 78% and female retention was 84%. A Texas study found that 9.2% of first year teachers left after first year which is similar to the national study (Sass, 2012). Teacher retention has been studied many times over many years. A 1984 study in Oregon agriculture teachers found that attrition rates were significantly different between genders albeit at a time when there were relative few female teachers (Cole, 1984). The purpose of this study was to quantify the attrition and movement among the state's agriculture teachers to compare with national data. California secondary agricultural education course enrollment has been growing steadily in the last 15 years from 68,360 in 2001 to 102,285 in 2014 (Spiess, 2015). **Growth and attrition have contributed to a chronic teacher shortage in the state** (McCabe, 2016). Data has been collected in the state by the department of education in a fall census for many years and in electronic form from 2000/2001 through 2015/2016. The self-reported data set allows new teacher cohorts to be identified and tracked. **A five year analysis was undertaken for cohorts 2000-2011 and a 10 year analysis for cohorts 2000-2006.** In addition to tracking simple attrition the study quantified the number of teachers re-entering the profession after one or more years of absence (re-entry teachers), teachers that leave the profession completely (leavers) during the study period, and teachers that changed schools (movers) which cause no net change to the teacher pool. The gender mix of teachers in the state is changing rapidly. In 2000 64% of teachers were male and in 2014 45% were male; in 2015 new teachers were 76% female (Spiess, 2015). This appears to be a national trend (Foster, 2014). **Understanding gender differences on teacher movement has become more important with the rapid change in teacher gender.**

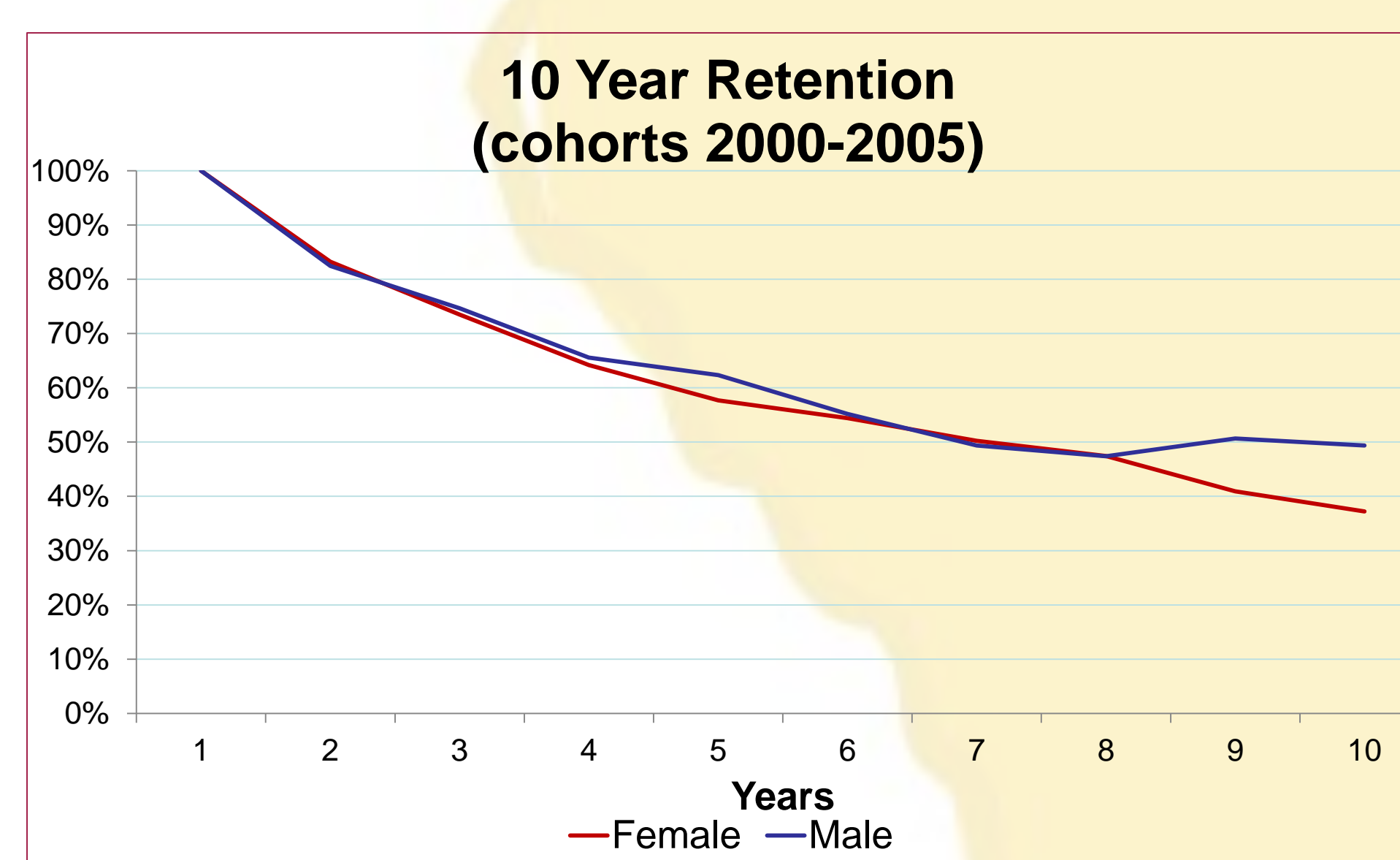
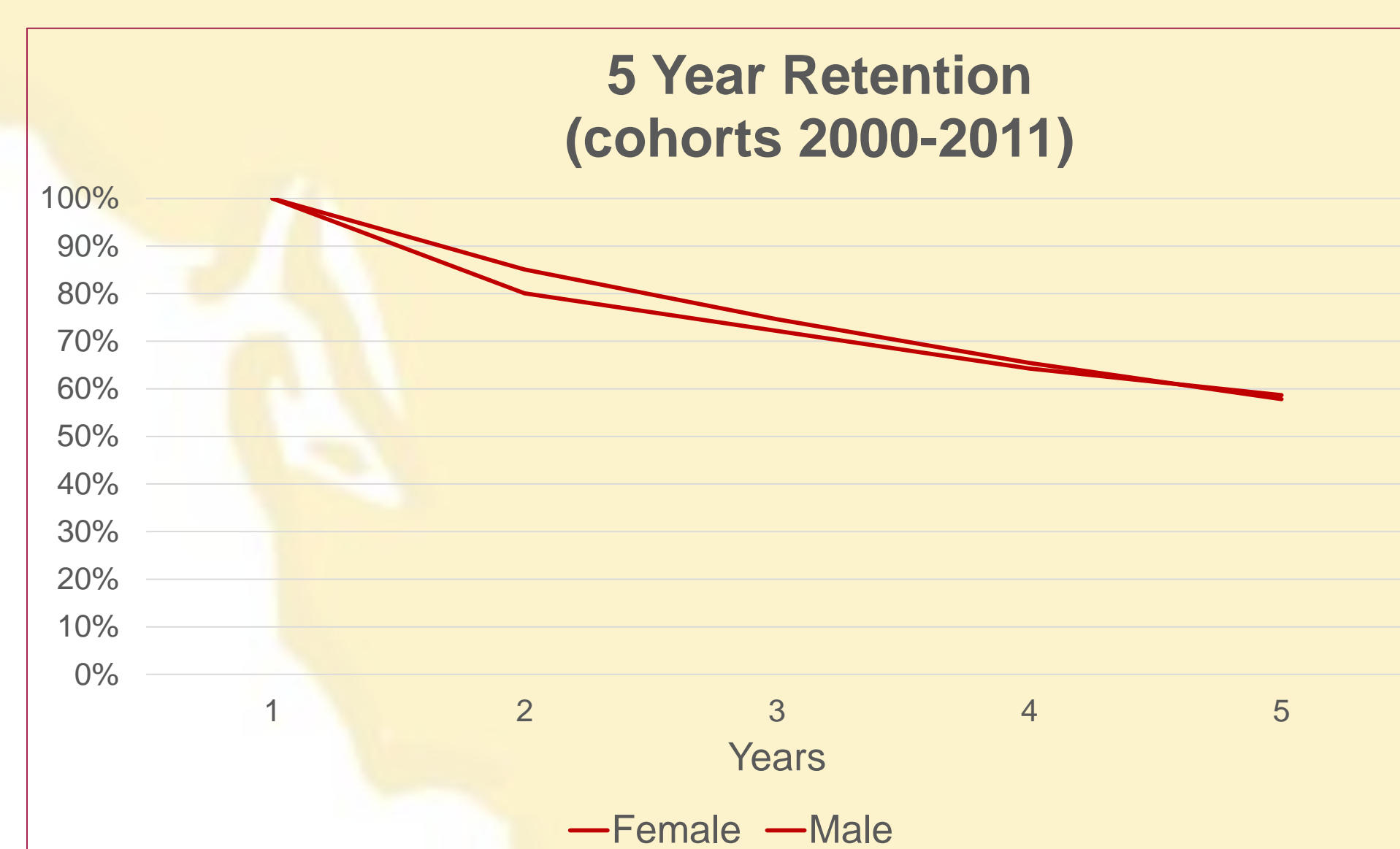


Methods

The state data includes year, school, name, gender, race, years of teaching, salary information, and type of credential. 11,265 records were examined from 2000-2015 and yielded 11,223 records after cleaning that were used for analysis. Once the data were cleaned the teachers that began teaching during the study period were divided into cohorts based on their year of entry into the **profession (years of teaching=1)**. Data were extracted from the SQL Server database and analyzed using Excel and SPSS. Attrition analysis was done by cohort. Leavers were identified for years 2000-2014 as teachers that were missing in the next year. Re-entry teachers were identified as teachers that did not teach in the previous year with more than 1 year of experience for years 2000-2015. Movers (2001-2015) were identified as teachers that taught at a different school in their previous assignment (not necessarily the previous year). Note that a single teacher can be a leaver, a re-entry, and a mover during the study period.

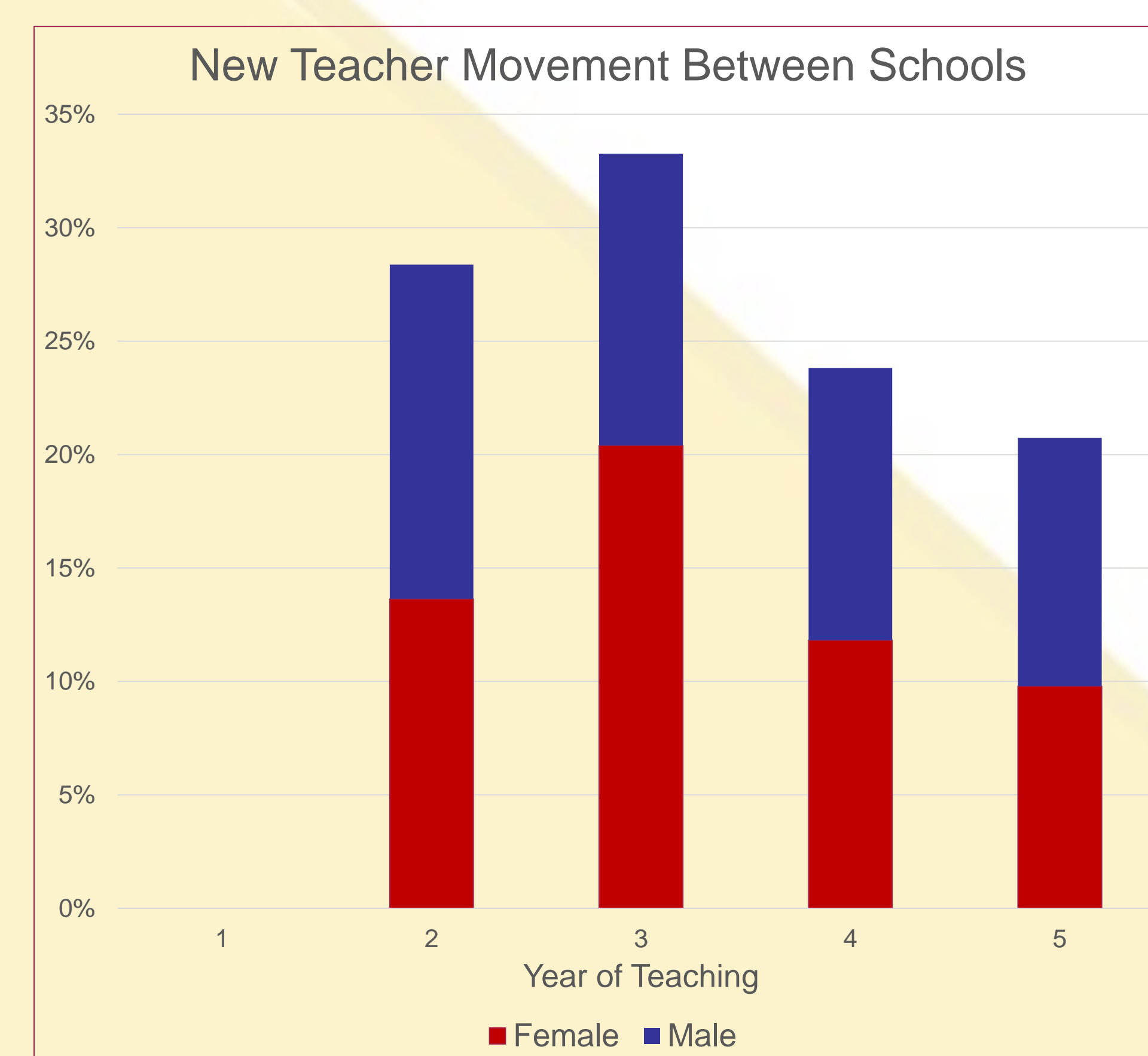
Objectives of this study were to:

1. Identify the number of new teachers entering the profession.
2. Identify teachers leaving the profession in a given year or completely during the study period.
3. Identify teachers changing schools within the state.
4. Determine if there are differences in teacher movement by gender.



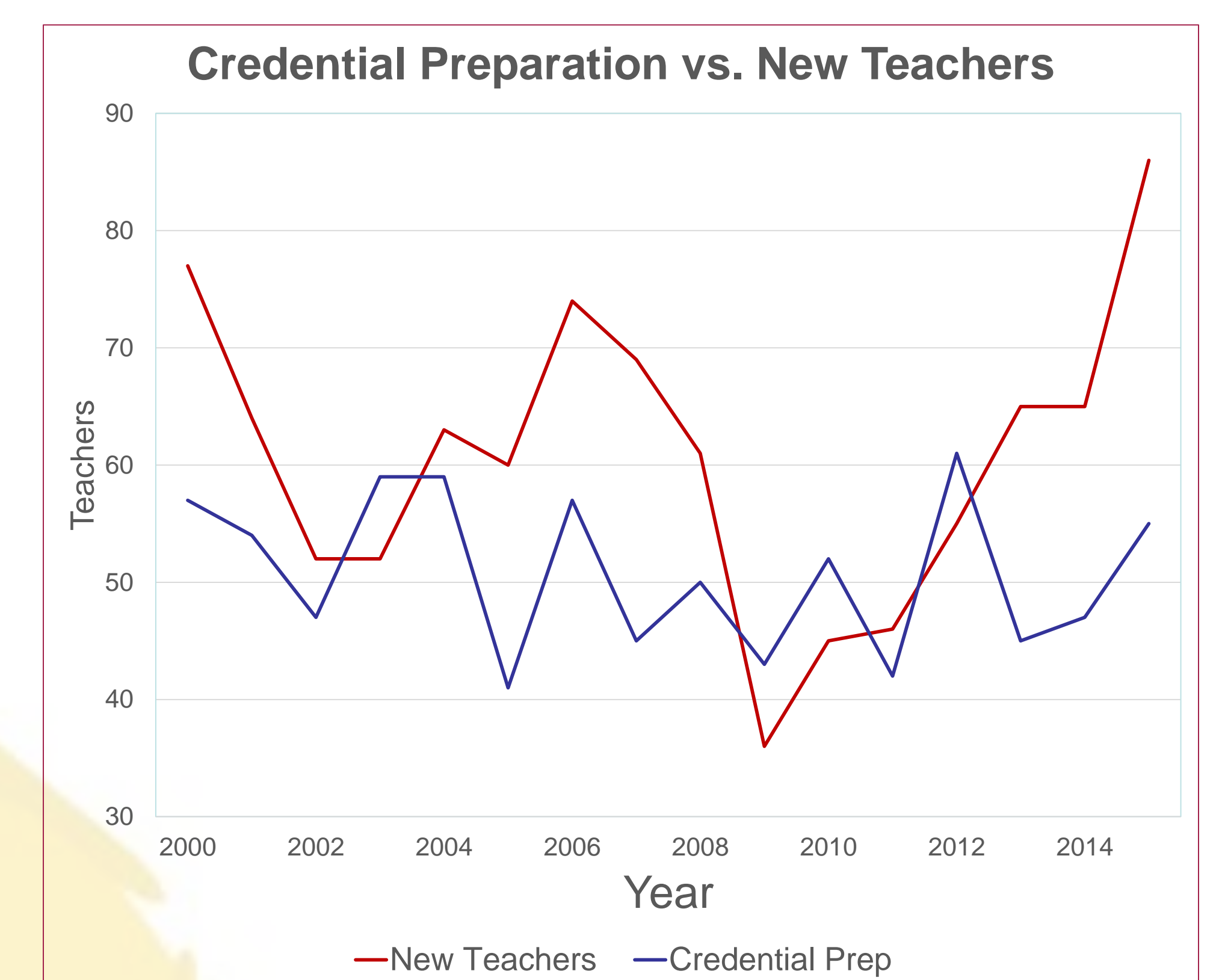
Results

Year is the year reported (in the Fall), for example 2000 indicates the 2000/2001 academic year. During the study period the number of active programs varied from 302 (2010) to 321 (2015). Percentages reported are based on the total teacher positions for the year. An annual average of 6 teachers (<1%) held assignments in two schools which will skew the data slightly as teachers may be double counted in some categories. The gender of new teachers entering the profession changed from 58% female in 2000 to 76% in 2015. 1751 unique teachers were identified and the total number of teachers in a given year varied from 652 in 2000 to 802 in 2015. In 2000 77 teachers entered the profession and 87 entered in 2015 with the average being 61. When compared to university reports of new teachers these numbers are higher by 20% (McCabe, 2016). **On average new teachers make up 9% of the total teachers with a yearly range of 5-12%. 38% of new teachers moved in the first five years. Leavers accounted for an average of 77 (11%) of the teachers per year with 5% female and 6% male. On average 63 teachers left teaching agriculture teaching and did not return during the study period. Re-entry teachers accounted for an average of 28 teachers (4%) evenly split by gender.** When examining the cohorts from 2001 to 2011 the 5 year retention rate for male teachers was 58% and 57% for female teachers. There was no significant difference between genders in 5 year attrition rate. For the cohorts 2000-2005 the 10 year retention rate was 34% for female teachers and 48% for male teachers. This is a significant difference ($P < .05$) over the 10 year period. The percent of teacher movement varied from 4% to 9% (years 2001-2015) with no significant difference between genders on average.



Conclusions/Recommendations

The 5 year attrition rate of California agriculture teachers is much higher than currently published national rates for K-12 teachers. Given the continuing shortage of teachers (McCabe, 2016) remedies should be sought to reduce this rate. Extending the service of leavers by a year or two would make a large impact on the teacher shortage. **Retention or recruiting more teachers will both solve the shortage problem, but retaining experienced teachers is a more stable solution for the state's agricultural programs.** A study in Texas looked at induction activities that reduced moving (Sass, 2012). They found: 1) Extra classroom assistance reduced the risk of moving and appeared to be the most powerful induction activity in reducing the risk of moving; 2) participation in seminars reduced the likelihood of moving, and 3) common planning time showed an impact on reducing the likelihood of moving. California has five institutions that prepare agricultural teachers. Each year some students that are certified do not take teaching positions at least in their initial year. We should determine the reason they choose not to teach. An unknown number may be entering the profession at a later date. It would be help to quantify this number and look to these individuals as a potential pool. Data from this study identifies leavers and could be used for a follow up study to determine the reasons for leaving. Commonly cited reasons for leaving the profession are change in residency, retirements, health/family, another career, job dissatisfaction (Foster, 2014; Sass, 2012). Reasons like retirement, moving, or family demands may be beyond our control but Foster cites the number two reason for leaving was for industry jobs. **The significant difference in gender is years 8-10 is striking.** The re-entry rate is similar indicating that these teachers are not returning. The trend suggests that the teacher ranks will become more female thus the problem will likely increase without effective intervention.



Cleaning the Data

Cleaning the data for this study was a large task. Raw data was provided every year by teachers as part of a reporting system (the "R2" report). A common ID was established for each teacher. The biggest hurdle was tracking name changes for female teachers. In many cases this was easy to see where the teacher appears in prior years at the same school. However if a name changed and their school changed some detective work was required. The second most common problem was tracking teacher experience. Reporting was often inconsistent. For example a teacher might report 6 years' experience then in the next year 8 years. By examining each individual teacher record this data was corrected before analysis.

Year	All Teachers			Left			Re-Entry			Moved			New Teachers			Multiple Assignments			Adjusted Total		
	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
2000	234	421	655	35	60	95							46	32	78	1	2	3	233	419	652
2001	240	428	668	35	50	85	12	31	43	14	17	31	34	28	62	3	4	7	237	424	661
2002	247	417	664	35	40	75	9	19	28	13	19	32	28	24	52	2	3	5	245	414	659
2003	246	428	674	32	57	89	11	18	29	8	22	30	27	25	52	2	8	10	244	420	664
2004	270	402	672	29	39	68	12	16	28	17	25	42	41	24	65	3	3	6	267	399	666
2005	295	400	695	39	54	93	12	18	30	19	30	49	39	21	60	2	4	6	293	396	689
2006	311	381	692	39	49	88	8	10	18	30	30	60	47	27	74	1	3	4	310	378	688
2007	323	380	703	41	46	87	14	21	35	25	23	48	37	27	64	3	1	4	320	379	699
2008	332	373	705	34	41	75	10	16	26	23	17	40	38	24	62	4	1	5	328	372	700
2009	332	356	688	34	40	74	12	6	18	19	19	38	21	15	36	4	3	7	328	353	681
2010	336	352	688	27	32	59	12	15	27	25	22	47	25	19	44	4	5	9	332	347	679
2011	354	343	697	35	21	56	14	13	27	20	12	32	32	14	46	3	1	4	351	342	693
2012	372	340	712	28	29	57	8	4	12	33	17	50	43	14	57	2	4	6	370	336	706
2013	400	344	744	45	30	75	16	15	31	39	26	65	42	17	59	1	3	4	399	341	740
2014	422	339	761	44	35	79	18	8	26	28	18	46	48	17	65	2	3	5	420	336	756
2015	470	335	805				26	12	38	45	22	67	65	21	86	1	1	2	469	334	803

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