

Recent Graduate and Undergraduate Enrollment Trends in American Soil Science Programs

Eric C. Brevik, Sergio Abit, David Brown, Holly Dolliver, David Hopkins, David Lindbo, Andrew Manu, Monday Mbila, Sanjai J. Parikh, Darrell Schulze, Joey Shaw, Ray Weil, and David Weindorf



Invitation to check our paper

Journal of the Indian Society of Soil Science
Vol. 62, No. 4, pp 299-306 (2014)

Invited Article

Soil Science Education in the United States: History and Current Enrollment Trends

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The study of soil science as an academic discipline was established more recently than the study of many other sciences, and in this brief 100 year time the teaching of soil science in the United States has undergone several significant changes. At its very beginning, soil science education took place in whichever institutions established programs of study. Over time, soils education in the United States became closely associated with agriculture and moved to the land grant institutions. Today, the land grant universities still form the backbone of soil science education in the United States, but soils concepts and topics are also taught in many other non-agricultural institutions around the country because of the varied practical uses of this resource. Soil science student enrollment was on the decline in the United States from the early 1990s through the early 2000s despite the fact that overall undergraduate student enrollment rose by about 11% over the same time period. A survey of United States institutions with soil science programs shows that student numbers have increased over the last seven years. While this increase in student numbers is positive news for the profession, there are long-term questions regarding where soil science fits in the academic structure of American institutions of higher education, as there appears to be an emerging shift in emphasis from an agricultural to an environmental focus.

**Recent Graduate and
Undergraduate Enrollment
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Recent Graduate and Undergraduate **Enrollment Trends** in American Soil Science Programs

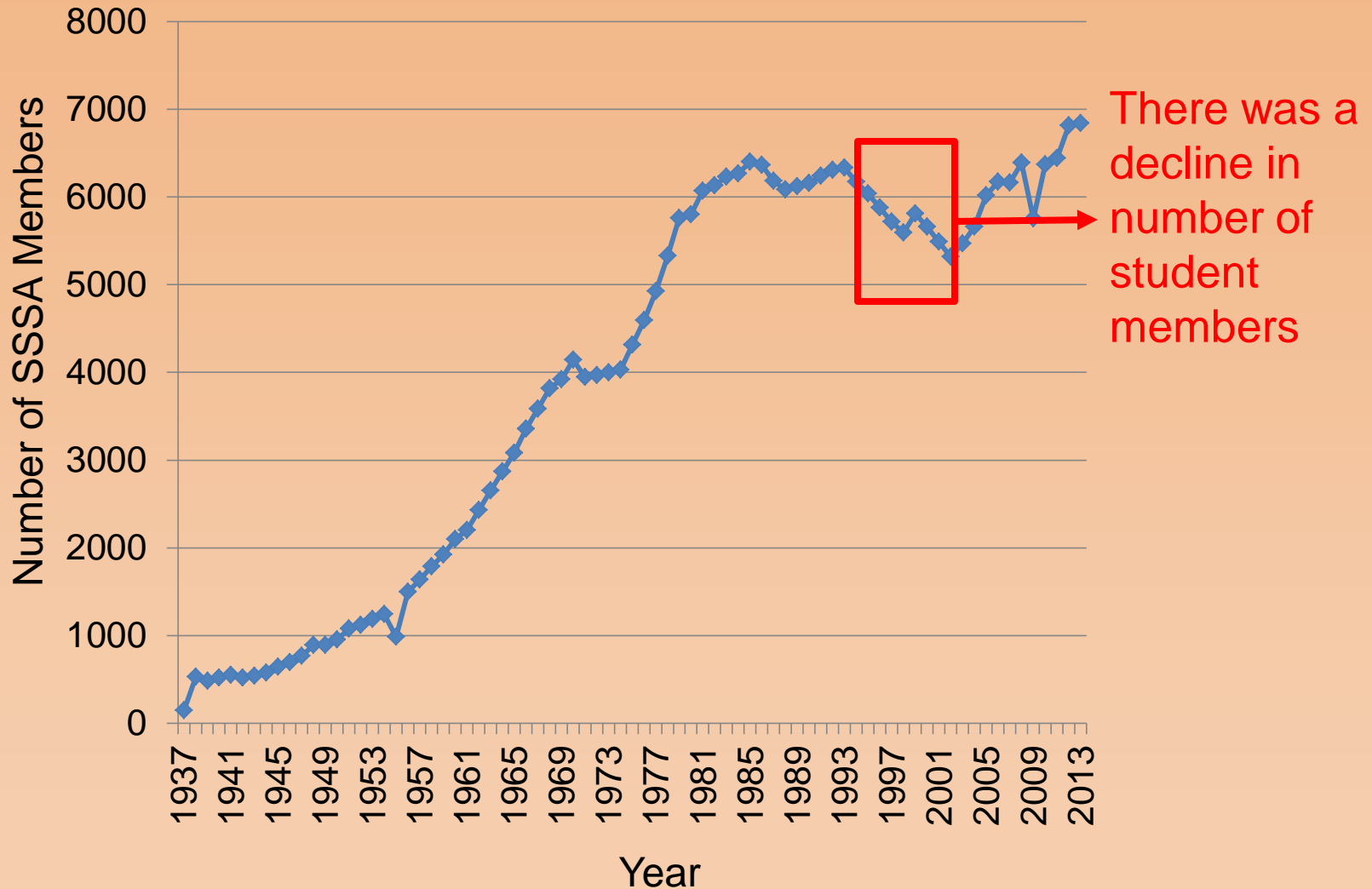


What is the benefit of knowing trends?



1. It allows assessment of the **past**, **current** and possibly **forecast** the state of things.
2. Trends serve as **starting point of possible actions**.

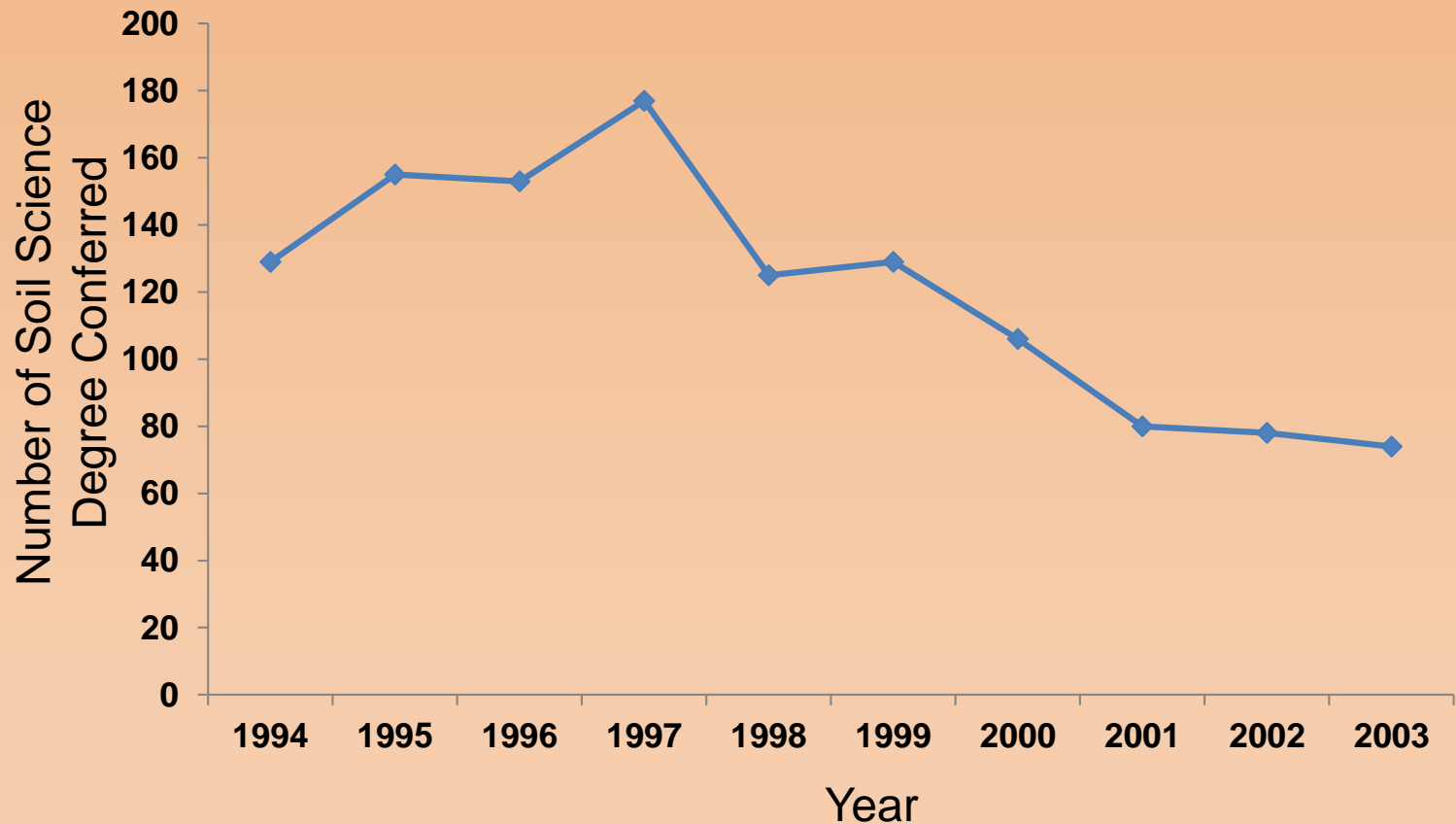
Soil Science Society of America Membership



Data Source: SSSA

The Decline Numbers

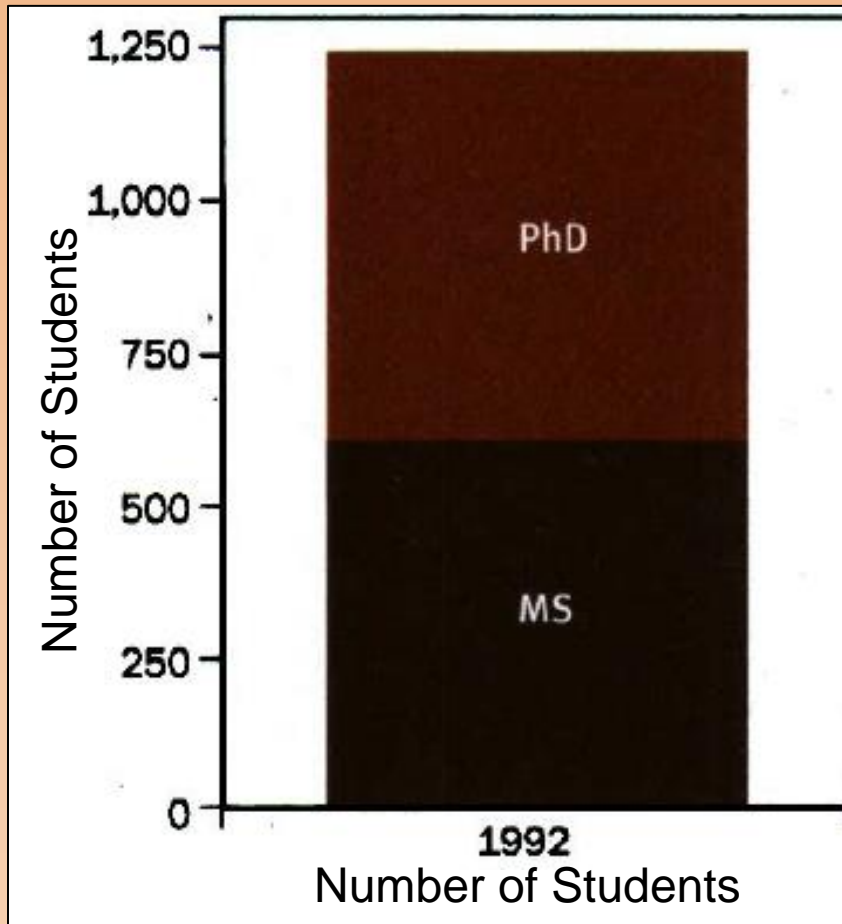
Number of B.S. Soil Science degrees conferred in the U.S.



Data Source: National Center for Educational Statistics

Students in MS and PhD Programs

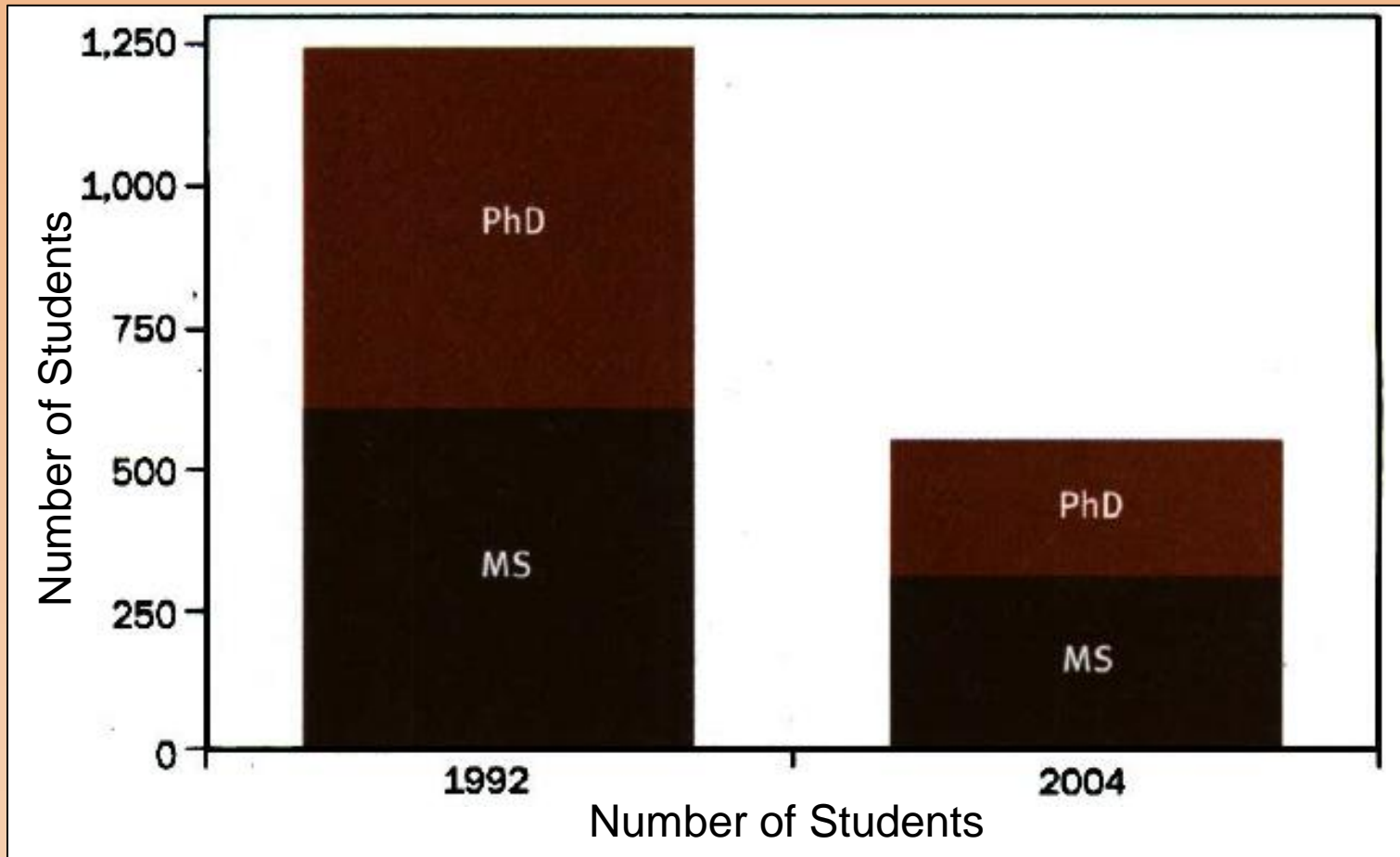
Universities in Canada and U.S.



Hartermink and McBratney, 2008
(adapted from data in Baveye et al., 2006)

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Some Reasons for Decline in Numbers

- Decline in rural population— leading to decline in numbers of students graduating in rural high schools (Bard et al., 2005).



This likely contributed to decline in enrollment in traditional agricultural subjects such as soil science (McKenn and Brann, 1992).

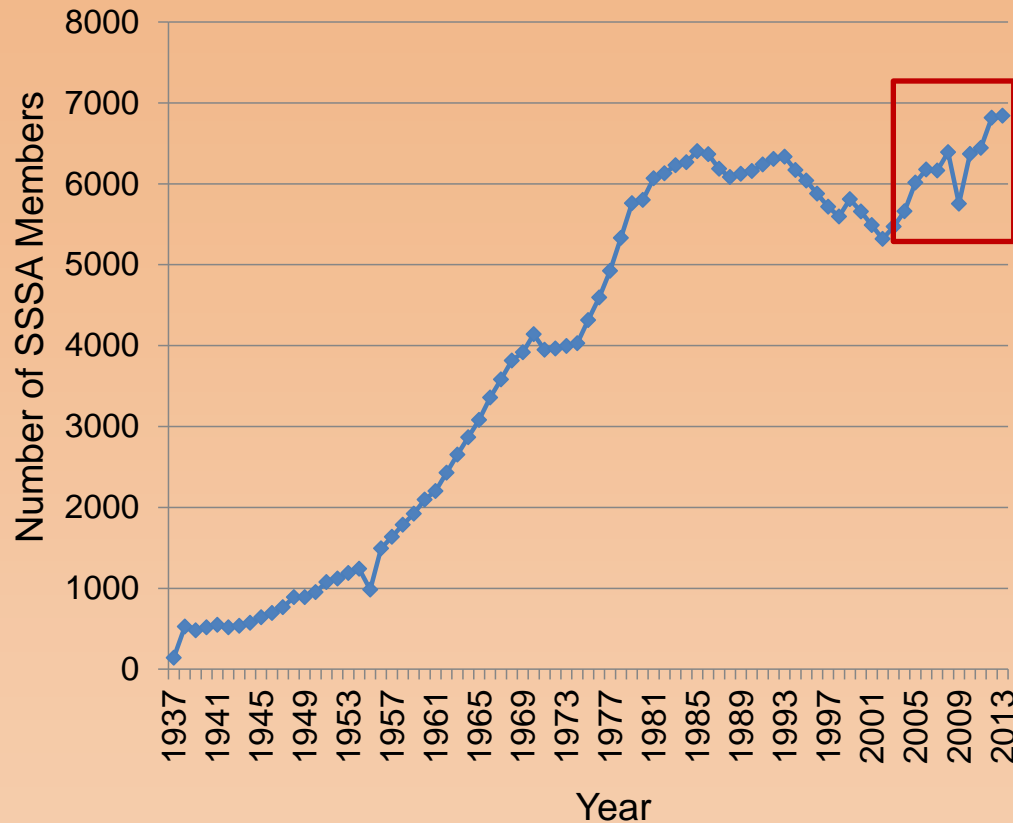
Some Reasons for Decline in Numbers

- Increase student interest in fields related to the environment (Havlin et al., 2010)
- A great majority of soil science researches focused on the relationship of soils and agriculture



Soil Science had been viewed as a branch of Agronomy rather than an independent field (Baveye et al., 2006)

The Turn-around



Was this related to increase in student numbers?

What has happened to student numbers since the 2006 report by Baveye et al.?

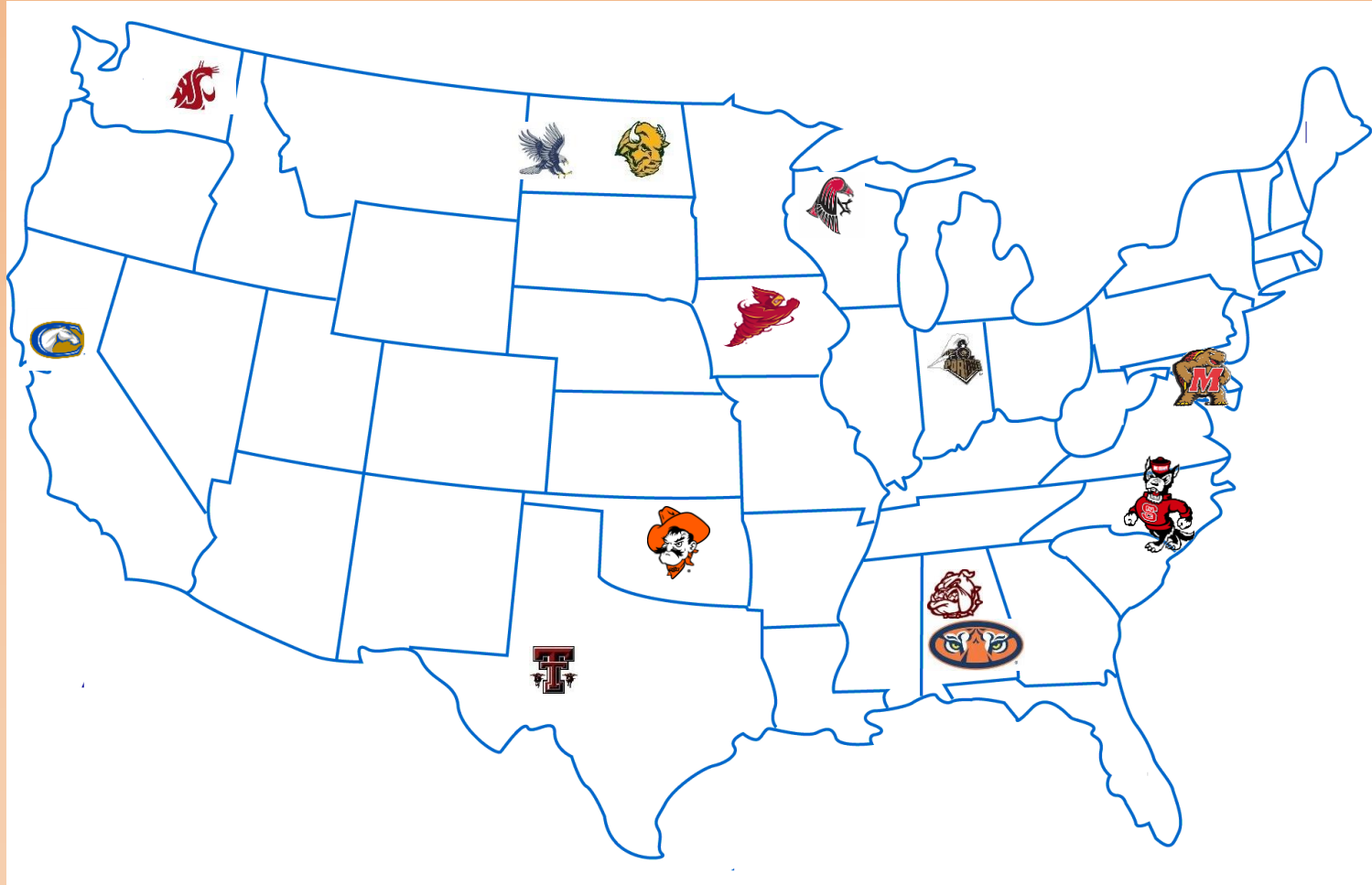
Our Survey

Participants

- Dickinson State University
- Oklahoma State University
- Washington State University
- University of Wisconsin River Falls
- North Dakota State University
- North Carolina State University
- Iowa State University
- Alabama A&M University
- University of California-Davis
- Purdue University
- Auburn University
- University of Maryland
- Texas Tech University

Our Survey

Participants



Information Gathered

- **Original Goal:** collect enrollment data from soil science degree-granting programs from 2004-2005 through the 2013-2014 SY
- **Individual institution** analysis – for all years that data was submitted
- **Composite analysis** - looks at combined enrollment of multiple universities; only covers 2007-2008 through 2013-2014

Scatter Plot
(with time)
Trend Lines

Undergraduate Enrollment – Individual School

Criteria in determining trends –slope of trend line

- > 0.5 = enrollment is **growing**
 - Between 0.5 and -0.5 = enrollment is **stable**
 - < -0.5 = enrollment is **declining**
-
- **46% (6 schools)** posted enrollment **gains**
 - **38% (5 schools)** had **stable** enrollments
 - **8% (1 school)** had a **decline**
 - One discontinued their undergrad program

Undergraduate Enrollment -Composite

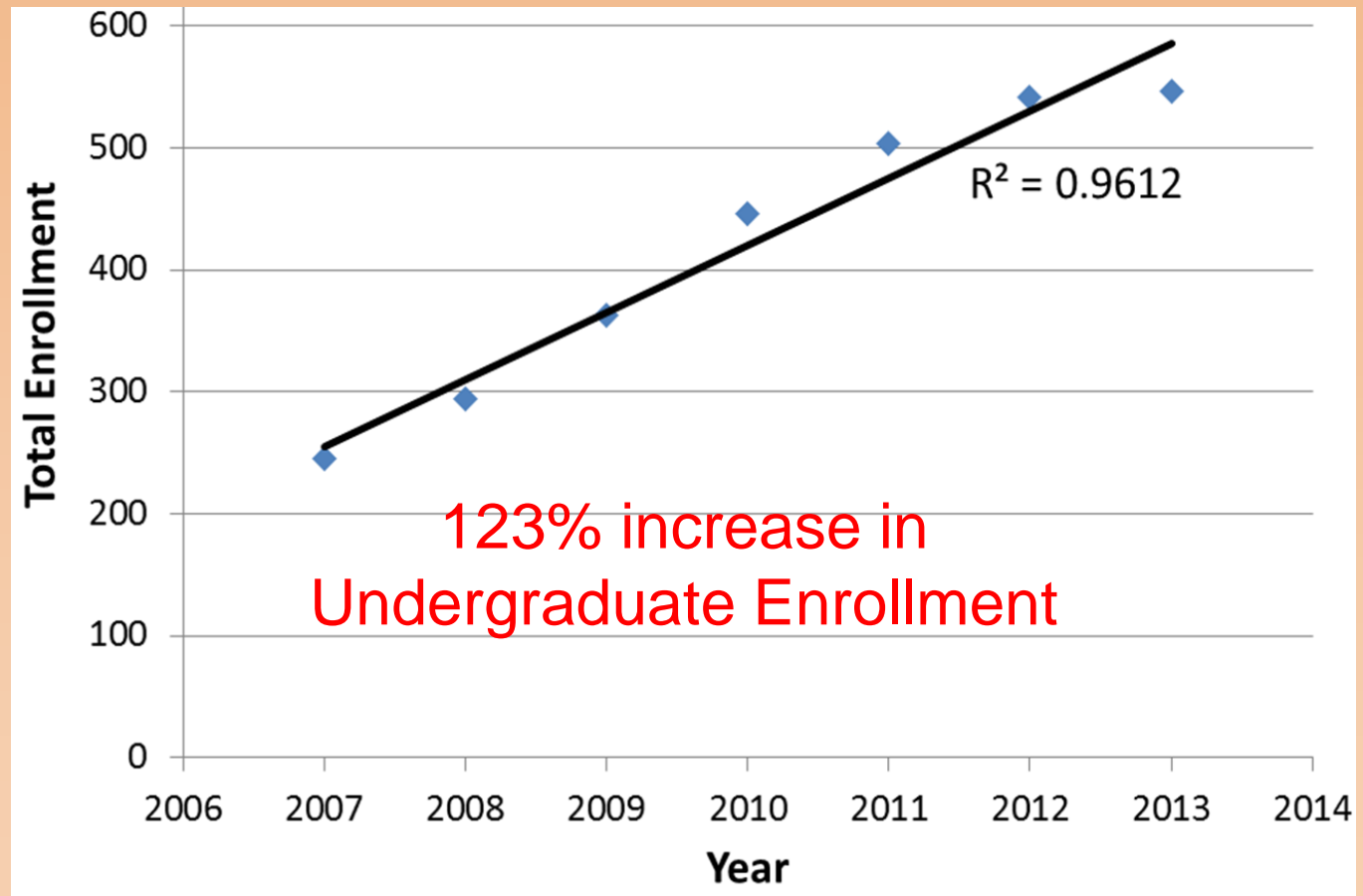
2007-08 to 2013-14

- All schools that submitted data:
 - 2.2 to 239.5 students per year
 - Composite average: 46.6 students per year
 - Included a school that had ~240 students

Undergraduate Enrollment -Composite

2007-08 to 2013-14

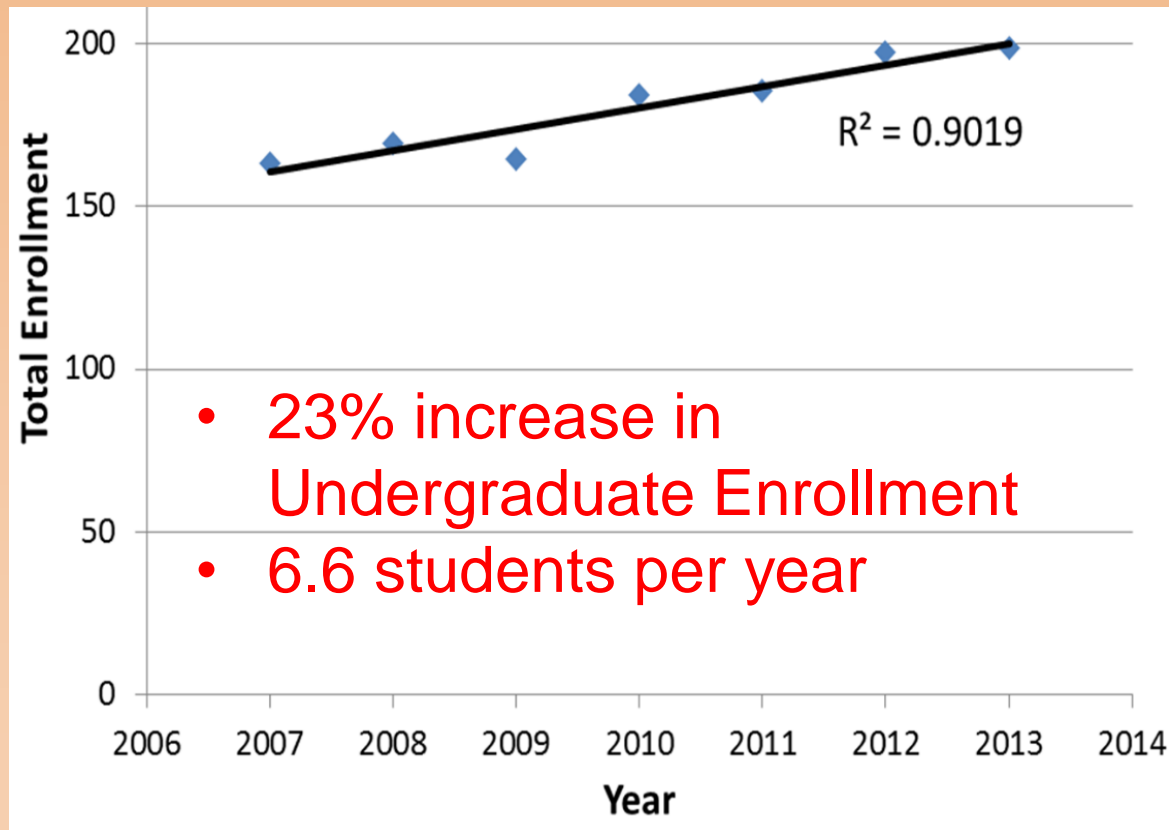
- Including school with very large enrollment



Undergraduate Enrollment -Composite

2007-08 to 2013-14

- Except the school with very large enrollment compared to others



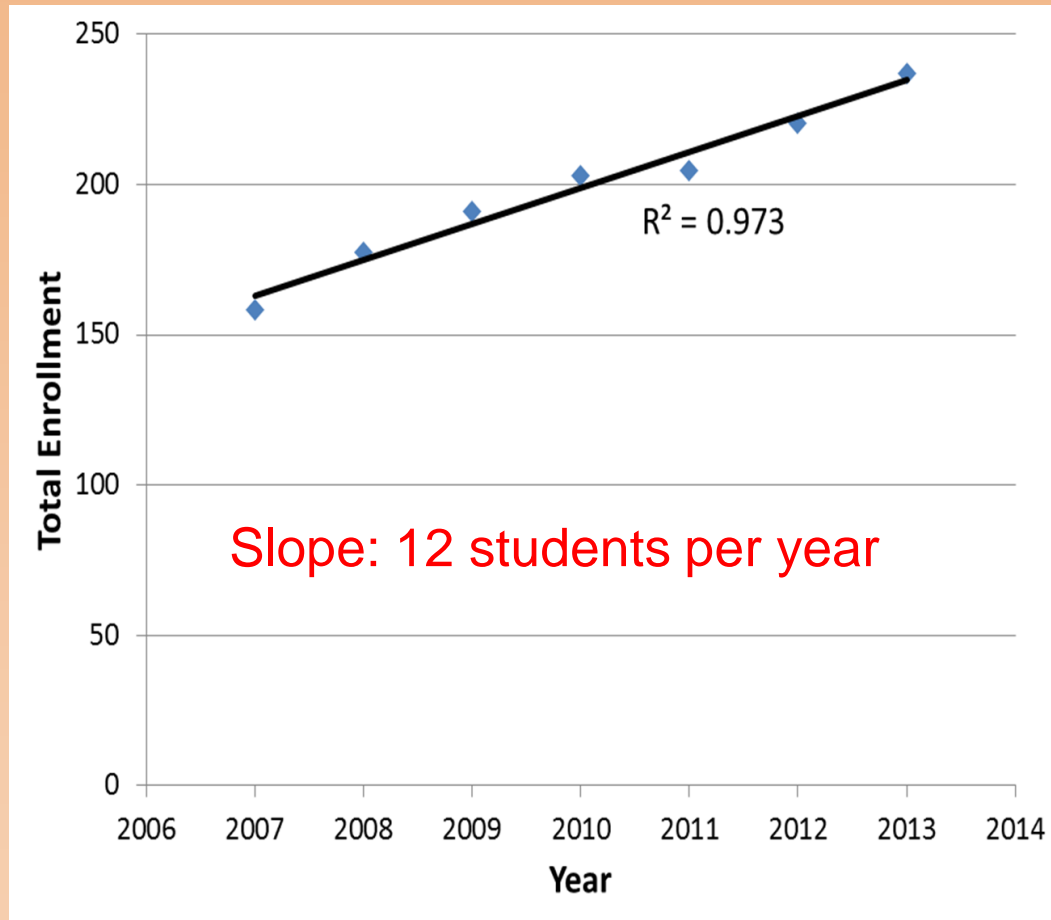
Graduate Enrollment – Individual School

Criteria in determining trends –slope of trend line

- > 0.5 = enrollment is **growing**
 - Between 0.5 and -0.5 = enrollment is **stable**
 - < -0.5 = enrollment is **declining**
-
- 40% (4 schools) posted enrollment gains
 - 50% (5 schools) had stable enrollments
 - 10% (1 school) had a decline

Graduate Enrollment -Composite

2007-08 to 2013-14



Other Evidence of Increased Interest

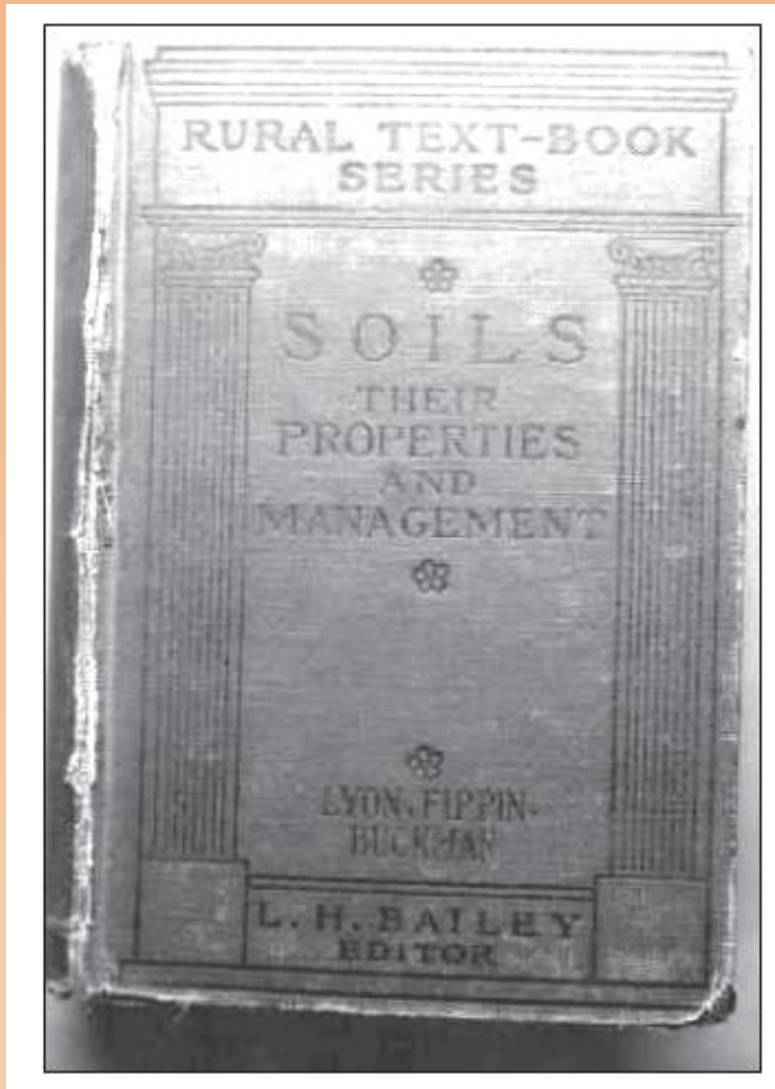
- Increasing number of soil science publications, increase in impact factor of soil science journals and increased inclusion of soil science in major global studies (Hartermink and McBratney, 2008)
- UN General Assembly –declared 2015 as the International Year of Soils
- SSSA membership in 2013 was an all-time high (6,842 members)

Take Home Point

- Overall, interest in Soil Science as an Undergraduate and Graduate major field of study is increasing.



This is a change in trend from the decline in undergraduate and graduate student numbers from 1994 to 2004.



Thank You!

the first modern soil science textbook used in
the United States

Reasons for Increasing Interest

The widening realization that the soil plays a vital role in key issues such as:

- food, water and energy security
- ecosystem services, biodiversity protection
- climate change
- human health

(Field et al. 2011; McBratney et al. 2014, Brevik and Sauer 2014)