

# Evan C. Mascitti

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## Summary

I am proud to be a soil and turfgrass scientist. I earned my PhD at Penn State in 2023, with a focus on engineered soil mixtures for baseball fields. I also worked as a sports turf manager for several years before returning to graduate school. While earning my PhD, I learned and demonstrated all the skills required of a modern scientist: conduct novel experiments, write in academic and popular formats, speak to a variety of audiences, teach and mentor students, build software, and obtain external funding. I currently work as a Senior Engineer at [Biocore LLC](http://Biocore LLC), where I facilitate research on high-performance athletic fields. For more about my background, please see my personal webpage ([evan-soil.io](http://evan-soil.io)).

## Education

### Ph.D, Soil Science - Penn State University (2023)

- Dissertation title: "Performance of baseball infield soil mixtures using novel laboratory tests"
- Graduate Student Teaching Certificate (September 2022)
- Graduate Student Online Teaching Certificate (May 2020)

### M.S., Agronomy - Penn State University (2014)

- Thesis title: "Effects of pre-harvest cultural practices on the divot resistance of thick-cut Kentucky bluegrass sod"

### B.S., Geology - Beloit College, Beloit, WI (2012)

- *Magna Cum Laude*
- Environmental Studies Minor

- Senior thesis title: “Temporal and geochemical controls of tufa deposition, southwestern Wisconsin”
- Varsity baseball:
  - Team honors: Workhorse award (2011-2012), Academic award (2011-2012), Most improved player (2011)
  - First-team All-Midwest Region (2012)

## Employment

### **Biocore LLC (July 2023-present)**

Charlottesville, VA

- *Senior Engineer*
  - Coordinate and execute playing surface testing as a contractor of the National Football League
  - Provide technical support to field managers, sod growers, and synthetic turf manufacturers
  - Curate and analyze proprietary data on athlete injury and performance
  - Prepare manuscripts for submission to peer-reviewed journals
  - Prepare content for executive briefings
  - Mentor junior engineers
  - Participate in strategic research planning
  - Contribute content and editorial services for Best Practices documentation on playing surfaces for American Professional Football

### **Pennsylvania State University (January 2019-June 2023)**

University Park, Pennsylvania

- *PhD student and graduate assistant*
  - Independent research on physical properties of engineered infield soils
  - Laboratory instructor for Introduction to Soils and Turfgrass soil physics
  - Other research and teaching duties as assigned

### **Pittsburgh Pirates Baseball Club (August 2016-December 2018)**

Pittsburgh, Pennsylvania

- *Manager of Field Operations* (April 2018- December 2018)

- Daily upkeep of the MLB playing surface at PNC Park, home of the Pittsburgh Pirates. Maintain turf and skinned areas, coordinate tarp deployment, monitor irrigation, apply fertilizer and pesticides, service/repair equipment, maintain chemical inventory and supervise non-baseball events. Hire, train, schedule, and oversee union staff and interns. Contribute to payroll and budgeting efforts.
- *Supervisor of Field Operations* (August 2016- April 2018)
  - see above

### **Gwinnett Braves Baseball Club (January 2016-August 2016)**

Lawrenceville, Georgia

- *Assistant Sports Turf Manager*
  - Maintenance of the playing surface at Coolray Field, home of the AAA Gwinnett Braves <sup>1</sup>. Duties comparable to those described above for PNC Park.

### **H&K Sports Fields (January 2015-January 2016)**

Madison, Wisconsin

- *Project Manager*
  - Coordinate and implement sports field renovations. Worked and/or consulted on >100 athletic fields in 2015 while generating \$178,000 of new contracts. Specific responsibilities included: specify and order materials, operate laser grading equipment, devise turfgrass maintenance programs, evaluate soil conditions through sampling/testing/analysis, cultivate relationships with clients, provide field maintenance training, and manage company blog and social media platforms.

### **New York Mets Baseball Club (May 2014-October 2014)**

Flushing, New York

- *Turf and grounds intern*
  - Maintenance of the MLB playing surface at Citi Field. Additional responsibilities included maintenance of hydroponic vegetable garden and outdoor landscapes.

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<sup>1</sup> Franchise name later changed to Gwinnett Strippers

## **Penn State University (August 2012-December 2014)**

University Park, PA

- *Graduate assistant*
    - Performed experiments at the Center for Sports Surface Research. Examples include traction testing at NFL stadiums, small-plot trials, lab analysis of soil samples per ASTM protocols, and maintenance of turfgrass greenhouse.
  - M.S. thesis: Effects of pre-harvest cultural practices on the divot resistance of thick-cut Kentucky bluegrass sod. Published in refereed [International Turfgrass Research Journal](#) (Nov. 2017) and summarized in [Sports Turf Magazine](#) (May 2016).
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## **Publications**

### **Peer-reviewed manuscripts**

**Mascitti, E.C.**, and A.S. McNitt. 2024. A laboratory method to measure deformation of baseball infield soil surfaces using cleated footwear. Proceedings of the Institution of Mechanical Engineers, Part P: Journal of Sports Engineering and Technology (online only). <https://doi.org/10.1177/17543371241237588>

**Mascitti, E.C.**, McNitt, A.S., and P.J. Drohan. 2024. Atterberg limits of baseball infield soils containing over-size particles, Part II: Effects of sand angularity and uniformity. Soil Research 62, SR23030. <https://doi.org/10.1071/SR23030>

**Mascitti, E.C.**, McNitt, A.S., and P.J. Drohan. 2024. Atterberg limits of baseball infield soils containing over-size particles, Part I: effect of particle size. Soil Research 62, SR23029. <https://doi.org/10.1071/SR23029>

**Mascitti, E.C.**, McNitt, A.S., and Serensits, T.J. 2017. Divot resistance of thick cut sod as influenced by preharvest nitrogen and sand topdressing. International Turfgrass Society Research Journal. 13: p. 1-8. <https://doi.org/10.2134/itsrj2017.01.0010>

### **Conference proceedings**

Aldahir, P.A., O'Cain, C.M., Yoder, J., **Mascitti, E.C.**, Spratley, E.M. 2024. Shoe-surface traction differences under NFL-relevant loads for natural, hybrid, and synthetic grass and turf; a scalable approach for in-situ testing. Proceedings of ISEA 2024 - The Engineering of Sport 15, Loughborough University, UK. <https://doi.org/10.17028/rd.lboro.27052423.v1>

## Manuscripts in preparation

**Mascitti, E.C.** and McNitt, A.S. 2025. Effect of particle size distribution and clay mineralogy on behavior of drying baseball infield soils. In preparation; planned submission to *Soils Science Society of America Journal*.

**Mascitti, E.C.** and McNitt, A.S. 2025. Using the unconfined compression test to measure toughness of fine-grained soils. In preparation; planned submission to *Applied Clay Science*.

## Trade magazine articles

**Mascitti, E.C.** 2021. What is clay? SportsField Management Magazine. October issue. <https://sportsfieldmanagementonline.com/2021/10/12/what-is-clay/13123/>

**Mascitti, E.C.** and McNitt, A.S., 2021. Dissecting infield playability. SportsField Management Magazine. March issue. <https://sportsfieldmanagementonline.com/2021/03/15/dissecting-infield-playability/12504/>

- also reprinted in the following periodicals:

- Pennsylvania Turfgrass, Spring 2021
- North Carolina Turfgrass, May/June 2021
- Tennessee Turfgrass, April/May 2021
- Mississippi Turfgrass Association Magazine, Summer 2022

**Mascitti, E.C.**, McNitt, A.S., and Serensits, T.J., 2016. Lean and mean: Sod production for in-season field replacements. SportsTurf Magazine. <https://sportsfieldmanagementonline.com/2016/05/31/lean-and-mean-sod-production-for-in-season-field-replacements/8035/>

## Blog posts

Available at [evan-soil.io/blog](https://evan-soil.io/blog).

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## Teaching experience (Penn State University)

### Instructor of record

SOILS 921a, Turfgrass soil physics/edaphology

- Spring 2023 (Instructor rating 7.0/7)

## **Lab instructor**

SOILS 102, Introduction to Soils

- Spring 2020 (Student rating 6.88/7 )
- Spring 2014 (Student rating 6.60/7)

## **Teaching assistant**

TURF 434, Turfgrass edaphology - Fall 2021

TURF 235, The Turfgrasses - Fall 2012

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## **External funding**

### **2020**

- Project title: Novel methods for baseball infield soil testing
  - Funded by the Foundation for Safer Athletic Fields for Everyone (SAFE) for \$5,000.
  - \$5,000 in matching funds received from Pennsylvania Turfgrass Council

### **2012-2013**

- Project title: Pre-harvest cultural practices for thick cut Kentucky bluegrass sod
    - In-kind support provided by Tuckahoe Turf Farms (sod, topdressing sand, and labor; estimated value \$8,000)
    - Matching funding by Keystone Athletic Managers Organization and Pennsylvania Turfgrass Council
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## **Presentations**

### **Academic/technical presentations:**

#### **2023**

- Performance of baseball infield soil mixtures using novel laboratory tests. PhD dissertation defense, Department of Ecosystem Science and Management, Penn State University (University Park, PA).

February 15.

## **2022**

- Rational mix design for baseball infield soils. ASA, CSSA and SSSA Annual Meetings (Baltimore, MD). November 8. [\[Recording link\]](#)
- Design and performance of soil mixtures used on baseball infields. Penn State Department of Ecosystem Science and Management Seminar (University Park, PA). April 25.

## **2021**

- A new laboratory method for measuring surface disruption of baseball infield soils. ASA, CSSA and SSSA Annual Meetings (Salt Lake City, UT). November 9. [\[Recording link\]](#)

## **2020**

- Effect of oversize particles on Atterberg limits of engineered soil mixtures for baseball and softball infields. ASA, CSSA and SSSA Annual Meetings (Virtual). November 9. [\[Recording link\]](#)

## **2017**

- Divot Resistance of Thick Cut Sod as Influenced by Preharvest Nitrogen and Sand Topdressing. 13th International Turfgrass Society meeting: New Brunswick, NJ. July 18.

## **2014**

- The effects of pre-harvest cultural practices on the divot resistance of thick-cut Kentucky bluegrass sod. Master of Science thesis defense. Presented in partial fulfillment for a Master of Science degree in Agronomy: Penn State University, University Park, PA. December 13. 2017
- Divot resistance of thick-cut sod as influenced by pre-harvest cultural practices. ASA, CSSA and SSSA Annual Meetings: Long Beach, CA. November 4.
- Turf with an Attitude: Sod Production for American Football Fields. Plant Science departmental seminar: Penn State University, University Park, PA. April 18.

## **2012**

- Temporal controls of tufa deposition, southwestern Wisconsin. Undergraduate thesis defense. Presented in partial fulfillment for a Bachelor of Science degree in Geology: Beloit College, Beloit, WI April 26.

- Using water to study rocks: temporal controls of tufa deposition, southwestern Wisconsin. 36th Annual undergraduate research symposium: Beloit College, Beloit WI. April 12.

## **Extension/outreach presentations:**

### **2025**

- NFL surface testing update. Professional Football Field Managers Association: Foxborough, MA. March 11.

### **2024**

- NFL surface testing update. Professional Football Field Managers Association: Houston, TX. March 20.
- Infield construction and renovation. Siteone U: St. Louis, MO. February 15.

### **2023**

- Lecture 17: Sports Turf Management. GreenKeeper University course series. December 23.
- Infield soil performance: measuring and achieving the cleat-in/cleat-out effect. Carolina Sports Field Managers Association Annual Conference: Myrtle Beach, SC. November 14.
- Infield soil selection and management. Wisconsin Sports Field Managers Association summer Field Day: Wisconsin Dells, WI. June 22.
- New lab tests for infield soils. Mid-Atlantic Sports Field Managers Association Spring Education event: Laurel Park Racetrack, Laurel Run, MD. March 2.
- Infield skin construction and renovation. Mid-Atlantic Sports Field Managers Association Spring Education event: Laurel Park Racetrack, Laurel Run, MD. March 2.

### **2022**

- High-performance infield soils. Major League Baseball Grounds Managers Symposium: Kauffman Stadium, Kansas City, MO. November 29.
- Soil science on the infield. Penn State Landscape & Ornamentals Field Day: Medlar Field, University Park, PA. July 29.
- Infield maintenance and materials. Keystone Athletic Field Managers Organization Field Day: White Township, Indiana, PA. June 22.



- The Performance of Infield Soils - From Materials Selection to Proper Maintenance. Keystone Athletic Field Managers Organization: East Earl, PA. February 18.
- Novel lab tests for baseball and softball infield mixes. Sports Field Management Association: Savannah, GA. January 18.

## **2021**

- Infield skin maintenance. Keystone Athletic Field Managers Organization Field Day: Reading, PA. September 16.

## **2020**

- Maximizing the performance of sports turf with plant growth regulators. PA Turf and Ornamentals School: Grantville, PA January 27.

## **2016**

- Developing performance standards for athletic turf. Georgia Sports Turf Managers Association Field Day: Precision Turf Farms, Braselton, GA. July 20.

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## **Guest lectures and invited presentations:**

## **2023**

- Soil compaction and plasticity tests. SOILS 402 guest lecture (Prof. Ekaterina Bazilevskaya). Feb. 22.

## **2022**

- Infield materials, construction, and maintenance. TURF 436W guest lecture (Prof. Pete Landschoot). April 26.

## **2021**

- Infield skin construction and maintenance. TURF 434 guest lecture (Prof. Andy McNitt). Nov. 3.
- Dissecting infield playability. FieldTurf sponsored webinar. April 7.

## 2020

- Penn State turfgrass science alumni panel. Live stream via Penn State College of Agricultural Science. Oct. 22.
- Engineered soils Q & A. Live YouTube broadcast by Beacon Athletics and DuraEdge Products. May 5. Recording available at <https://www.youtube.com/watch?v=nW4q4CZ1v-c>
- Snacks, soil, and surface area. SOILS 071 (Environmental Sustainability) guest lecture: Penn State University. January 21.
- History of the STMA and baseball field dimensions. Penn State STMA Student Challenge training: University Park, PA. January 13.

## 2019

- Soil physical properties for athletic fields. Penn State STMA Student Challenge training: University Park, PA. November 4.

## 2017

- What's grad school all about? Beloit College Advising Day: Beloit, WI. March 24.
- Student-athlete alumni panel. Beloit College Advising Day: Beloit, WI. March 24.

## Podcast interviews

### 2025

- The Science of Surface Firmness and Traction. *Cornell Turfgrass Show 2025* [[Recording link](#)]

### 2024

- In the Dirt/On the Turf With Evan Mascitti. *Frankly Speaking (TurfNet Radio)* [[Recording link](#)]

### 2023

- Baseball Infield specifications *Cornell Turfgrass Show 2023*: Episode 10. [[Recording link](#)]

## 2022

- Early-season infield care and material selection. *Cornell Turfgrass Show 2022*: Episode 4. [[Recording link](#)]

## 2021

- Safe baseball infields. *Cornell Turfgrass Show 2021*: Episode 10. [[Recording link](#)]
  - What makes a quality infield mix? *Fresh Cut Grass*: Season 1, episode 9. [[Recording link](#)]
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## Skills and Expertise

- Applied turfgrass and soils research; design of experiments; method development
  - Expertise in soil physical properties
  - Proficiency with a variety of computer software including languages for data science (R, Python, Bash, SAS, SQL), markup and typesetting (Markdown, LaTeX, Pandoc), pipeline automation (GNU Make), version control (Git), basic web design (HTML5, CSS3), and Microsoft Office
  - Effective communication through oral, written, and graphical means. Basic Spanish language competency
  - Personnel management, including hiring, training, scheduling, and payroll
  - Management of cool-season and warm-season turfgrass
  - Laser grading/construction/renovation/maintenance of infield skin, pitcher's mound, and home plate areas
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## Honors and Scholarships

- Andrew McNitt Graduate Fellowship (Penn State University, 2019-2023)
- Dr. James Watson Graduate Scholarship (Sports Field Management Association, 2022)
- C. Reese Berdanier Endowed Award (Penn State University, 2019)
- Penn State Graduate Student Assistantship- full tuition remission plus stipend (2012-2014)

- Waddington-Harper Scholarship - awarded to outstanding students who plan careers in sports turf management (Keystone Athletic Field Managers Organization, February 2014)
  - Joe Kobylka Award – given to a student-athlete who has best exemplified the qualities of sportsmanship and team spirit throughout their career (Beloit College, May 2012)
  - Phi Beta Kappa academic honor society (Beloit College, May 2012)
  - Eagle Scout Rank (Boy Scouts of America, 2006)
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## **Industry service**

- Sports Field Management Association Minor League Baseball Groundskeeper Education task force member (Sept. 2021- Aug. 2022). Development of educational documents for construction and maintenance BMPs.
- Independent consulting for sports field contractors and soil suppliers

## **Professional Memberships**

- Sports Field Management Association (2012-present)
  - American Society of Agronomy/Crop Science Society of America/Soil Science Society of America (2014-present)
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## **Personal interests**

- History and philosophy of science
- Fitness
- Cooking
- Nonfiction books
- Outdoor adventures