Optimizing Youth Sports Fields to Reduce Environmental Impact

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School and public sports fields are a significant investment for our state, yet they are consistently neglected, leading to unsafe conditions for athletes and adverse environmental impacts.

Our project will optimize maintenance of these landscapes to improve function for athletes and reduce negative environmental impacts; our three activities will be to:

1. Determine best management practices for sports fields that optimize function while reducing negative environmental impacts
2. Assess sports field user preferences and outcomes in response to alternative management practices
3. Survey decision makers about sports fields to inform outreach and education

UMN Rec Soccer Field

Soil compaction

MPa
- 0.9 - 2.4
- 2.4 - 3.9
- 3.9 - 5.4
- 5.4 - 6.5
- 6.5 - 8.4
- 8.4 - 9.9
- 9.9 - 11.4
- 11.4 - 12.9

SPORTS FIELD ATTRIBUTES

Soil compaction is an example of a sports field characteristic that affects athlete performance, injury occurrence AND the environment. As shown on this map, there can be varying degrees of compaction; this inconsistency can lead to injury. Compaction also leads to poor water infiltration that can cause to storm water runoff and erosion.

ATHLETE OUTCOMES

These maps show the distribution of GPS points and speeds within a sports field based on tracking athletes during game play. We will use customizable map overlays (as shown to the right) using GIS spatial analytic methods and will integrate performance, injuries, and field conditions (e.g., soil compaction) and identify areas of risk.
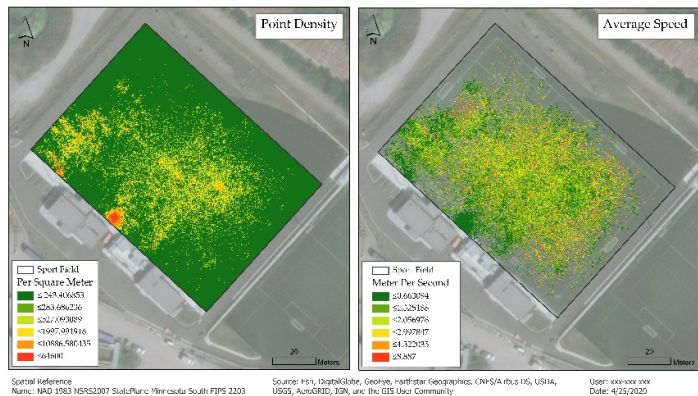
Improving natural turfgrass sports fields will help in the safety of our young athletes while increasing protection of our environment.