American college football competitions

American college football competitions have a rather complicated organizational structure. College teams mostly play other similarly sized schools, requiring the introduction of a divisional system. Division I generally consists of the major collegiate athletic powers with larger budgets, more elaborate facilities, and more athletic scholarships. Beneath Division I are lower divisions consisting of smaller public and private institutions. Football teams in Division I are further divided into the Bowl Subdivision, or the 1-A Subdivision, and and the Championship Subdivision, or the 1-AA Subdivision. The higher Bowl Subdivision has historically not used an organized tournament to determine its champion, and instead teams compete in post-season bowl games.
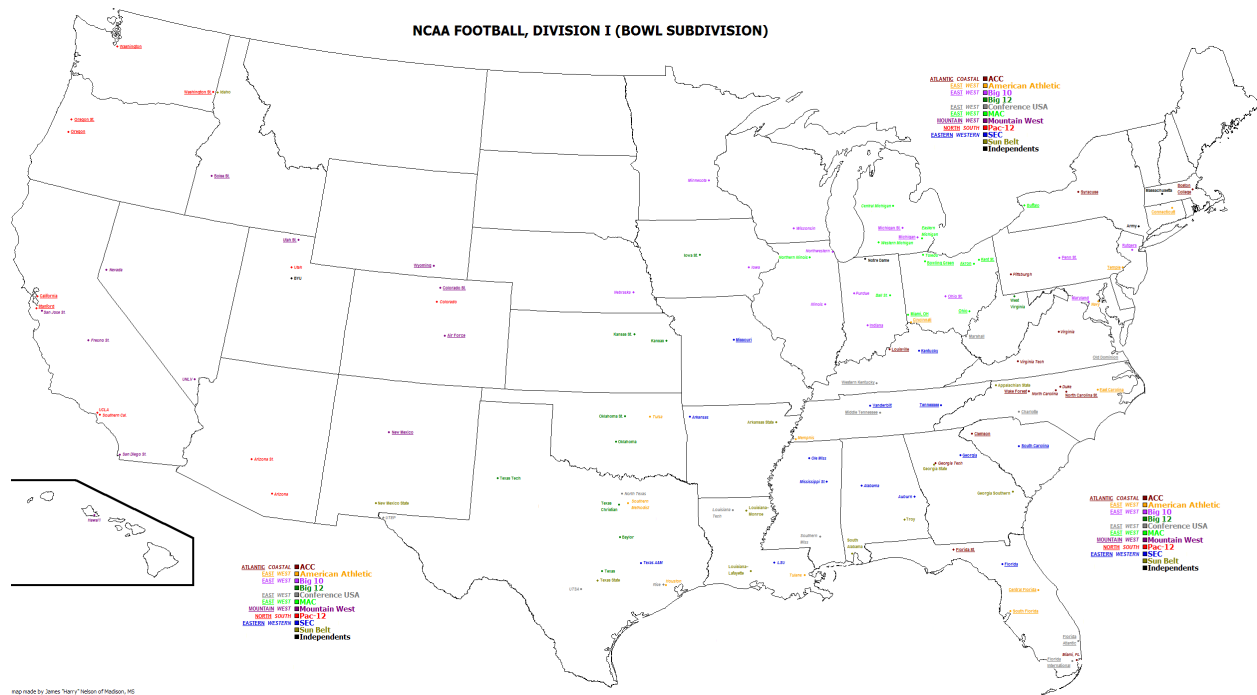

Figure 1: FBS in 2015

Bigger map

In season 1994 Division 1-A consists of 11 conferences with a total of 107 teams. The teams in each conference play most of their games against other teams from the same conference, but also 2 or 3 games against teams from other conferences or lower divisions. We have the data of the schedule for season 1994, which includes 636 games in total. In these games 36 lower divisional teams appear, which play 1 or 2 games in the competition. There is not sufficient information to rate these lower divisional teams. Hal Stern proposes to give all these teams a baseline rank of some constant, say 0. This, of course, is not a perfect decision, as these team may vary considerably in strength.

After the end of the regular season each conference nominates a winner. The conference winners play an additional one or two post-seasonal matches. These matches are called *bowl games* and are considered to be non-competitive or exhibition games. Outside of the competition, two informal but popular polls are conducted to nominate the champion or best team of all conference winners. One poll is conducted among

sports journalists, while the other is conducted among coaches. The two polls agreed for season 1994 and nominated Nebraska as the best team. Nebraska and Penn State are the only two undefeated teams in regular season and in bowl games. Are sociological polls a reliable method for determining the season's best team? The author points out that these two polls have historically disagreed, as it happened for season 1990 and season 1991. What can a statistical sports rating system say in that regard? This is the focus of Hal Stern's paper. His conclusion based on the Least Squares Ratings is that actually the best team for season 1994 was Penn State.