

Where do Those Numbers Come from, Again? Fossil-carbon Emissions Estimates on Various Space and Time Scales

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Early investigations of fossil-carbon accumulation in the atmosphere required annual estimates of global emissions. Now, inverse modeling and other techniques for quantifying processes involved in the global carbon cycle require information on space and time scales corresponding to the daily cycle of emissions from specific urban areas (1). Mitigation issues have also raised the need for emissions estimates at fine space and time scales and for specific source classes (e.g., cement and steel manufacture). Additional applications that have emerged include identifying individual carbon “footprints” and carbon emissions attributable to large sporting events. These latter applications require specific information on emissions per passenger mile, emissions per kilowatt-hour of electricity consumed, and similar quantities which can vary on small space and time scales. Some history and details of estimating carbon emissions will be reviewed, particularly as they apply to CarbonTracker and similar NOAA projects.

Reference: (1) Gurney et al., 2007. Research Needs for Finely Resolved Fossil Carbon Emissions, EOS, 88 (49), pp 542-543.

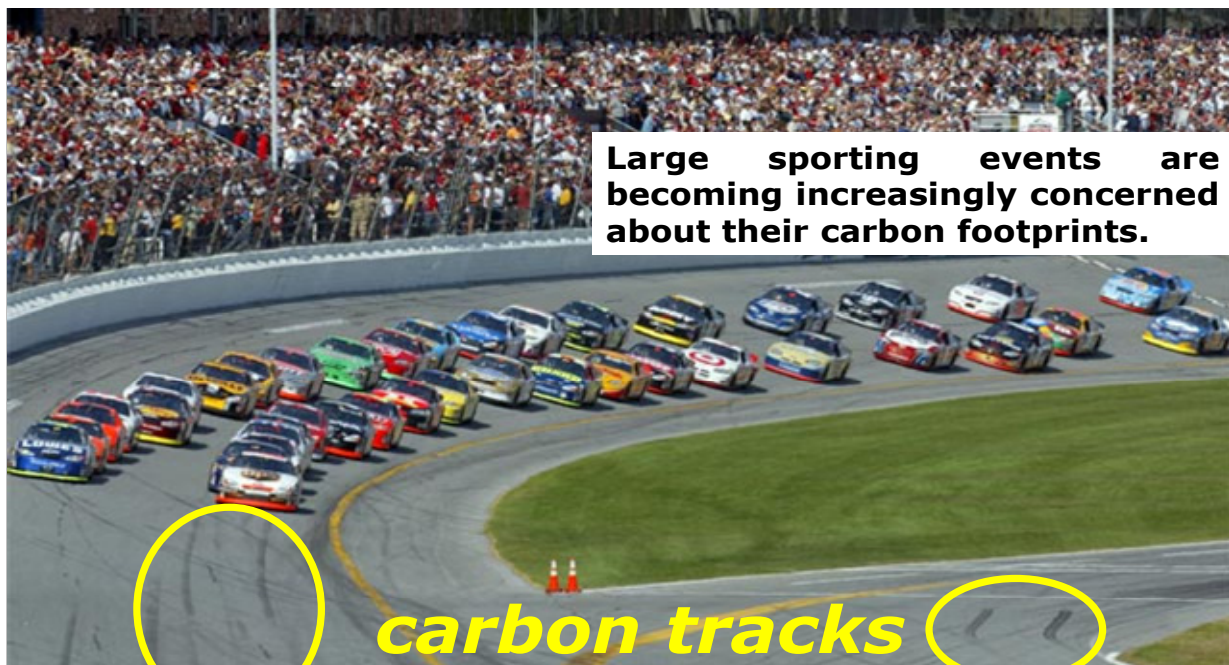


Figure 1. Large carbon emissions on small space and time scales.