This paper focuses on assessing productivity in basic research programs, and on how the ability to make these assessments insulates these programs from political interference. The enormous sums spent on these projects are often justified by predictions about their contributions to knowledge, the economy, or innovation. But at virtually any point in the lifecycle of such programs, it is not easy to explain to the public or elected officials why the program is a compelling investment, given that the benefits will emerge only over time—if at all. Our focus here is on how evaluators might use the interim outputs of scientific work-in-progress (“waypoints”) to revise their judgements about the merits of a research proposal. As a first step in the analysis, this paper develops a two-player game between a principal investigator and a program officer. The goal is to identify the characteristics of waypoints that make them useful tools for assessment and to assess the trade-off between waypoints that minimize the rate of false positives and those that minimize the probability of false negatives.

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