FOREST CONSERVATION EVALUATION TOOL (FCET)

BRIEF OVERVIEW

More information on our methods and our data is available under "Metadata."
Detailed instructions for using the tool are available under "Instructions."

Citing the FCET: Blackman, A. and A. Egorenkov. 2016. Forest Conservation Evaluation Tool. Washington, DC: Resources for the Future. Available at: http://fc-evaluation-tool.net

Rationale

Although tropical deforestation in Mesoamerica continues to have severe environmental impacts, the human, financial, and technical resources available to curtail it are limited. Therefore, it is critically important that these resources are spent on forest conservation policies that are effective. Unfortunately, however, credible evidence on policy effectiveness is quite scarce. We know little about whether and under what conditions community forestry, eco-certification, payments for environmental services and other leading policies actually stem deforestation.

A key reason is that the conventional approach to evaluating the effectiveness of forest conservation policies is flawed. It entails comparing the rate of deforestation inside an area affected by the policy with the rate outside. The problem with this strategy is that forest conservation policies are not randomly located. Rather, they tend to be sited in places with above- or below-average pre-existing deforestation rates—usually the latter. Evaluations that do not control for that fact conflate the effects of the policy with the effects of its location.

For example, evaluations of protected areas typically compare the rate of deforestation inside a protected area with the rate outside and attribute the difference to the protected area. But protected areas are usually sited in remote places that have low rates of deforestation to begin with. Hence, conventional evaluations wrongly give protected areas all the credit for these relatively low deforestation rates, thereby dramatically overestimating their effectiveness.

Over the past decade, a new more rigorous method for evaluating forest conservation policies has emerged. It entails the using deforestation data from satellites along with statistical methods that control for non-random siting (for an introduction, see Blackman 2013). Intuitively, these methods measure effectiveness by comparing deforestation in policy areas to deforestation nonpolicy areas that are similar in terms of the characteristics that drive deforestation such as distance to cities. That is, these techniques compare "apples-to-apples." Although evaluations of forest conservation policies using these methods have begun to appear, for the most part, they are being conducted by and for academics. Uptake by policy makers has been slow.

Two key barriers have slowed uptake. The first is the cost of the requisite data. These methods require fine-scale GIS data on forest cover change and on land characteristics, all compiled into a relational database. Collecting, cleaning and compiling these data is time and labor intensive. The second barrier has to do with technical expertise. These methods require facility with GIS

and statistical software like ArcGIS, R and Stata.

Objective

The Forest Conservation Evaluation Tool (FCET) aims to overcome these barriers. It is a freely available, user-friendly webtool that has on-board all the requisite data. It is designed to allow a non-technical user to generate results in a single short session.

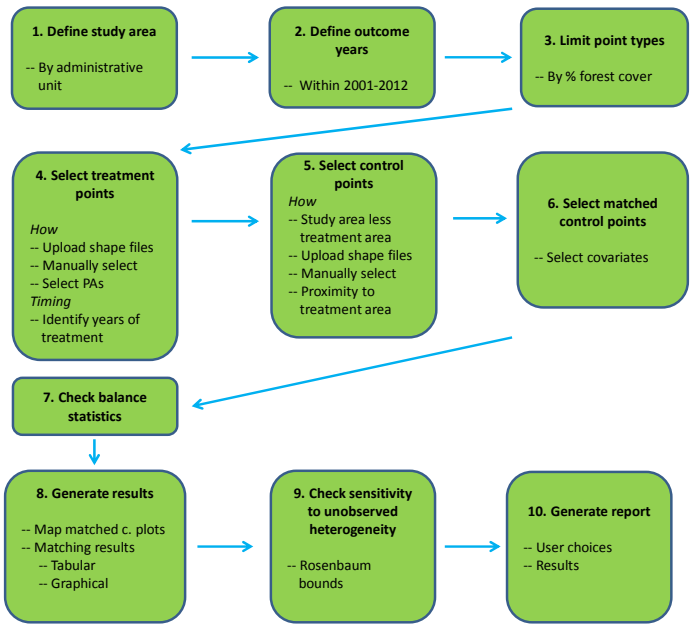
Methods overview

The FCET measures the effect on deforestation of an existing forest conservation policy. That policy must be one that affects some forest areas and not others. Examples include protected areas, eco-certification, or payments for environmental services. The FCET cannot be used to evaluate the effect of a policy like removal of logging subsidies that affects all forests in a study area.

Although it will eventually be expanded, at the FCET's current geographic scope is Mesoamerica. The underlying spatial unit of analysis is a dimensionless point. The FCET relies on a sample of more than one million points in Mesoamerica and the DR. These points were selected by overlaying a 1km rectangular grid on Mesoamerica and then selecting all points at the intersection of the gridlines that were forested in 2000.

Using these points, an estimate of the effectiveness of a forest conservation policy is generated as follows (Figure 1).

Figure 1: FCET user interaction and functions



1. The user defines a *study area*: an area comprised of first-level administrative units (e.g., states in Mexico, departments in Guatemala) where the effect of the forest conservation policy is to be evaluated.

2. The user identifies *outcome years*: the range of years between 2000-2001 over which the effect of the policy on deforestation will be measured.

3. The user limits *point types*, by setting a threshold for year 2000 forest cover that will be used to define which point will be included in the analysis.

4. The user selects *treatment points*: forested points in the study area that have been affected by the forest conservation policy.

5. The user selects *control points*: points in the study area not affected by the forest conservation policy that likely to include at least some points 'similar' to those affected by the policy.

6. The FCET identifies *matched control points*: control points that are similar to treatment points. To do this the FCET uses a statistical technique called propensity score matching (PSM). To facilitate that, the user must select *control variables*: land characteristic variables ('covariates') such as slope and distance to cities that will be used to define similarity between treatment points and control points.

7. The FCET generates *balance statistics*: statistics in tabular and graphical format that give the user an idea of how similar the matched control points are to the treatment points. Further detail on PSM and balance statics is provided below.

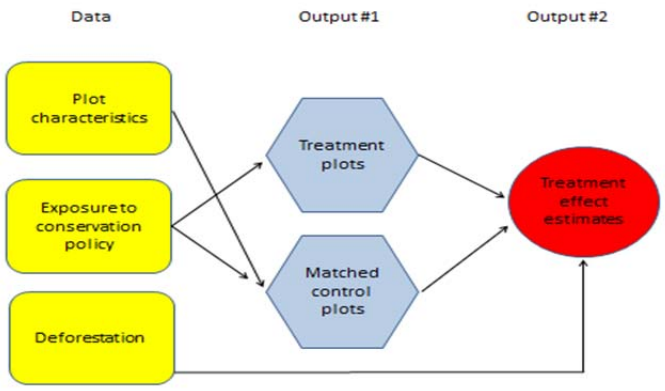
8. The FCET calculates the *forest conservation policy's effect*: the difference between the deforestation rate on treatment points and matched control points. The FCET outputs this result in tabular and graphical format. Further detail on the FCET's effect estimates is provided below.

9. The FCET checks *sensitivity to unobserved heterogeneity*: how sensitive are results from Step 8 to unobserved confounding factors. This analysis gives the user a sense of how robust and reliable are FCET results. Further detail on this sensitivity analysis is provided below.

10. The FCET outputs a *report*, that contains all of the choices the user has made, and all of the results and sensitivity analyses the FCET has generated.

The following figure sketches the FCET's conceptual framework.

Figure 2. FCET conceptual framework



The yellow rounded rectangles represent the three types of point-level spatial data that the tool uses, specifically, data on: (i) land characteristics that drive deforestation, for example, slope and proximity to cities; (ii) exposure to the conservation policies; and (iii) deforestation. The blue hexagons represent the first output of the tool: samples of (i) treatment' points; and (ii) matched control points. Finally, the red circle represents the second output of the tool: estimates of the effect of the conservation policy on deforestation.

REFERENCES

Blackman, A. 2013. Evaluating forest conservation policies in developing countries using remote sensing data: An introduction and practical guide. *Forest Policy and Economics* 34:1-16.