

E-forest platform:  
Roles of domain variables  
At the example of forest area estimation

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# Introduction: the very simple case

- we assume a systematic sample (regular grid) of single plots **covering the whole stratum**
- the `is_forest_plot` variable is in this case the target variable (indicating forest plots)
- denote the stratum surface area with  $a$
- estimation of proportion  $p$  of forest in the stratum and total forest area  $t$  in the stratum

$$\hat{p} = \frac{\text{number of forest plots}}{\text{total number of plots}}$$

$$\hat{t} = a \times \hat{p}$$

# Domains I

- we assume some **sub-areas of the stratum** which are not considered in (national) forest area estimation
- examples may be lakes, military areas
- in other words: the estimates for  $p$  and  $t$
- note: sampling grid is covering these sub-areas
- these sample plots are marked with  $dom\_for = 0$ , other plots are marked with  $dom\_for = 1$  or  $dom\_for = -1$  (see below)
- estimation of proportion of forest  $p$  and total forest area  $t$

$$\hat{a}_{dom} = a \times \frac{\text{number of plots with } dom\_for \neq 0}{\text{total plots}}$$

# Domain = 1 or domain = -1

- we assume some **sub-set of plots in the domain** ( $\text{dom\_for} \neq 0$ ) having missing data
- examples may be plots not accessible by field teams, ...
- these sample plots are marked with  $\text{dom\_for} = -1$
- estimation of proportion  $p$  of forest and total forest area  $t$

$$\hat{p}_{\text{dom}.2} = \frac{\text{number of forest plots with } \text{dom\_for} = 1}{\# \text{ total plots with } \text{dom\_for} = 1}$$

$$\hat{t}_{\text{dom}.2} = \hat{a}_{\text{dom}} \times \hat{p}_{\text{dom}.2}$$

- note: the variable `is_forest_plot` must have a valid value (1 or 0) for plots with  $\text{dom\_forest} = 1$