

MODIS Land Cover Status

Boston University Land Cover Team

MODIS Team Meeting

December 18, 2001

Overview

- Product Status
- Accuracy Assessment and Validation
- Primary and Secondary Classification Labels and Confidences in the Northeast
- Comparison with EDC DISCover (at-launch) in the Pacific Northwest
- Collaborative Comparisons
- Anticipated Release (including CMG, BGC Biomes)
- Land Cover Dynamics (Change and Phenological Change)

Released Global Land Cover Products

- 2000289: Beta status, released April 15, 2001
 - Based on 16- day periods of Nadir BRDF-Adjusted Reflectance (NBAR) from July 00 - Dec 00
 - IGBP classification layer only (Land_Cover_Type_1)
- 2001001: Provisional status, released June 15, 2001
 - Based on 16-day NBAR, EVI from July 00 – Jan 01
 - Uses prior probabilities to help separate agriculture and natural vegetation
 - Includes IGBP classification, secondary classes, confidence measures; UMd classification; LAI/FPAR classification
 - Draws from at-launch product when less than 4 periods of NBARs are available or when classification confidence is less than 40%

Provisional Land Cover Product Jul 00 - Jan 01



Validation: Accuracy Assessment

- Classification Accuracy from Cross-Validation of Training Sites
 - Hide 20 percent of training sites, classify with remaining 80 percent; repeat five times for five unique sets of all sites
 - Provides “confusion matrix”
 - Not a stratified random sample, but a good within-class indication of accuracy
- Per-pixel Confidence
 - Based on statistical “boosting” theory
 - Allows decision-tree classifier to estimate probability of classification associated with each possible class label
 - Output for label with highest probability for each pixel

Northeast Provisional Land Cover Product, Jul 00-Jan 01

Agriculture

Agriculture/Natural
Vegetation Mosaic

Evergreen
Needleleaf
Forest

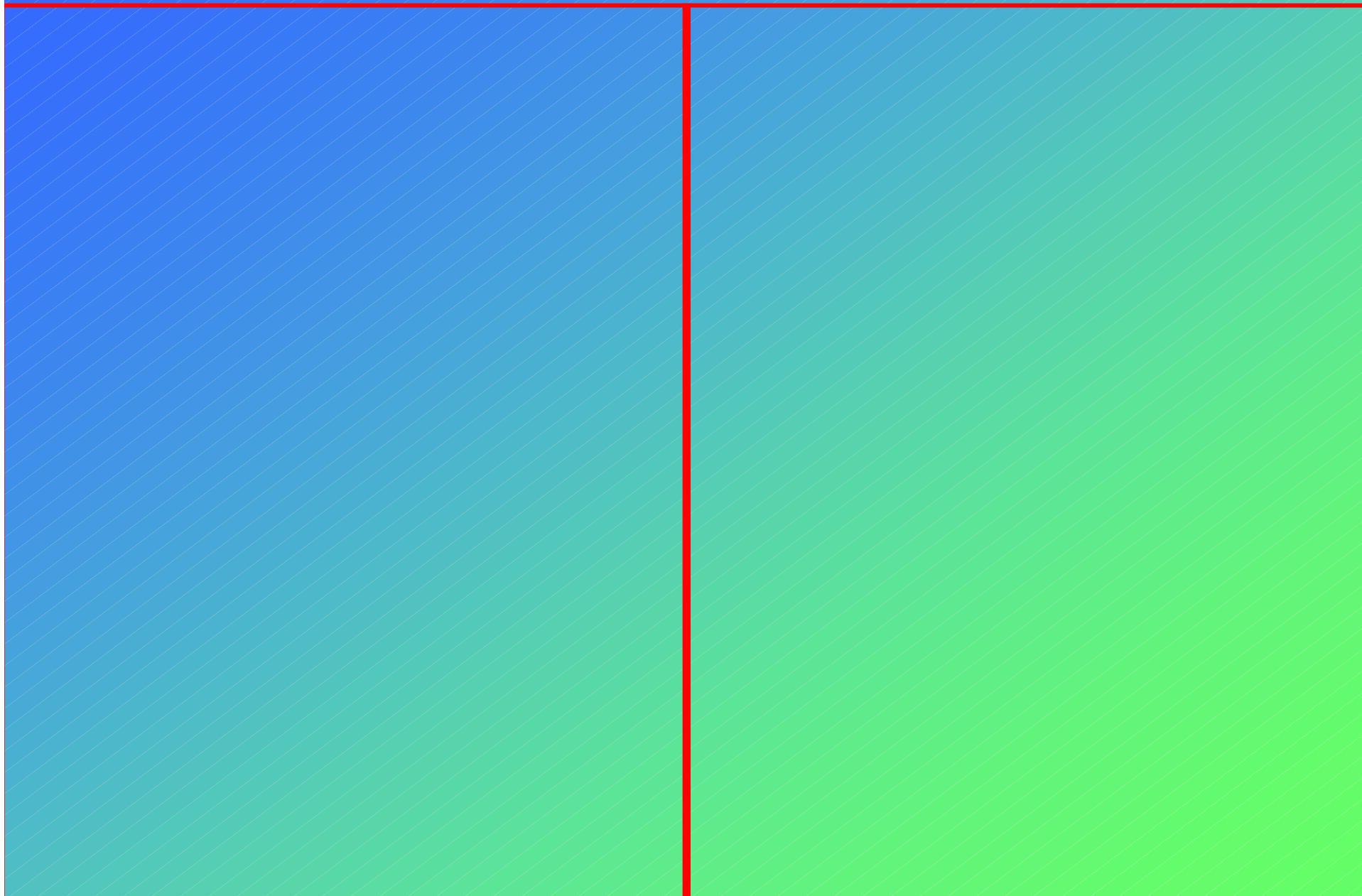
Mixed Forest

Deciduous
Broadleaf
Forest

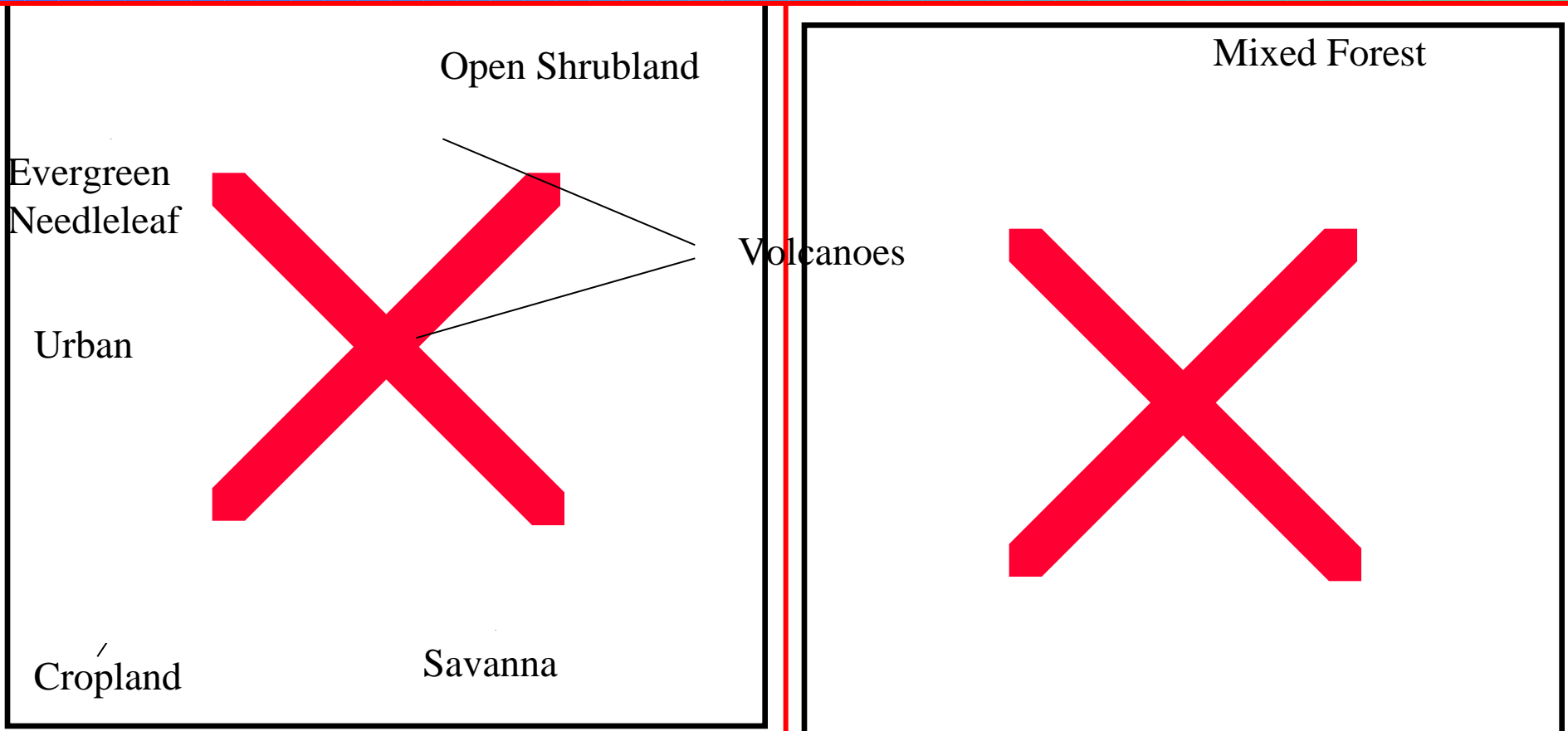
Urban

**Classification
Confidence Map**

**Second Most-Likely
Class**



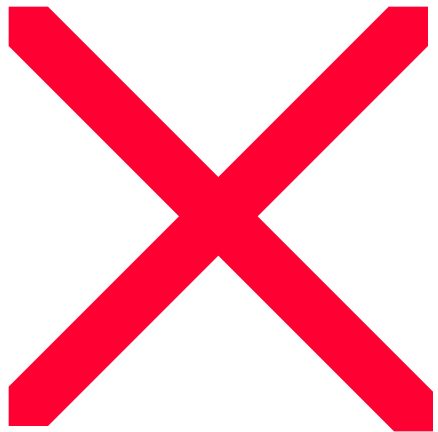
Pacific Northwest Comparisons



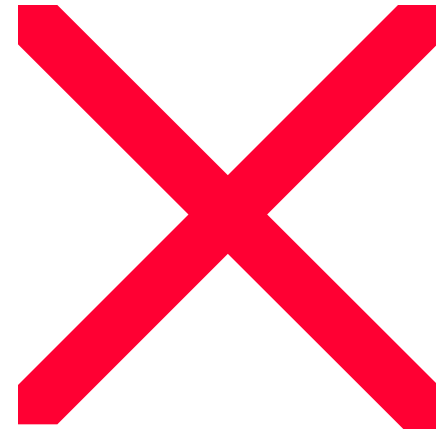
EDC DISCover2000 V. 2

MODIS Provisional

Pacific Northwest Comparisons



MODIS Provisional

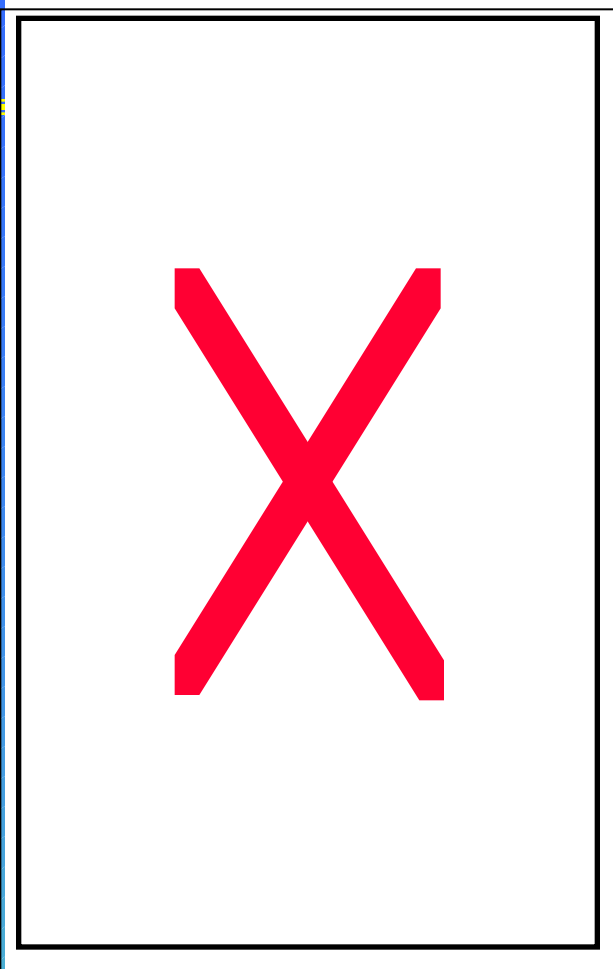


TM Mosaic

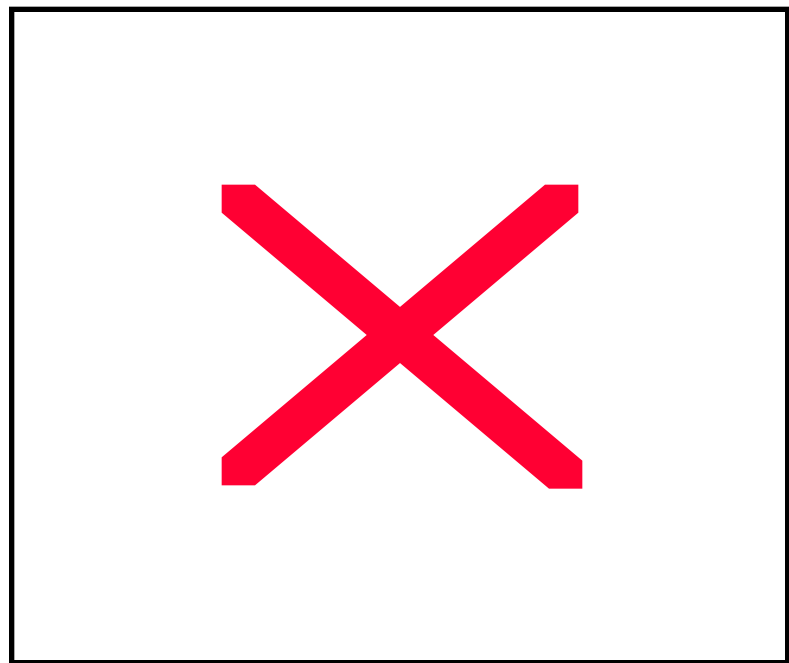
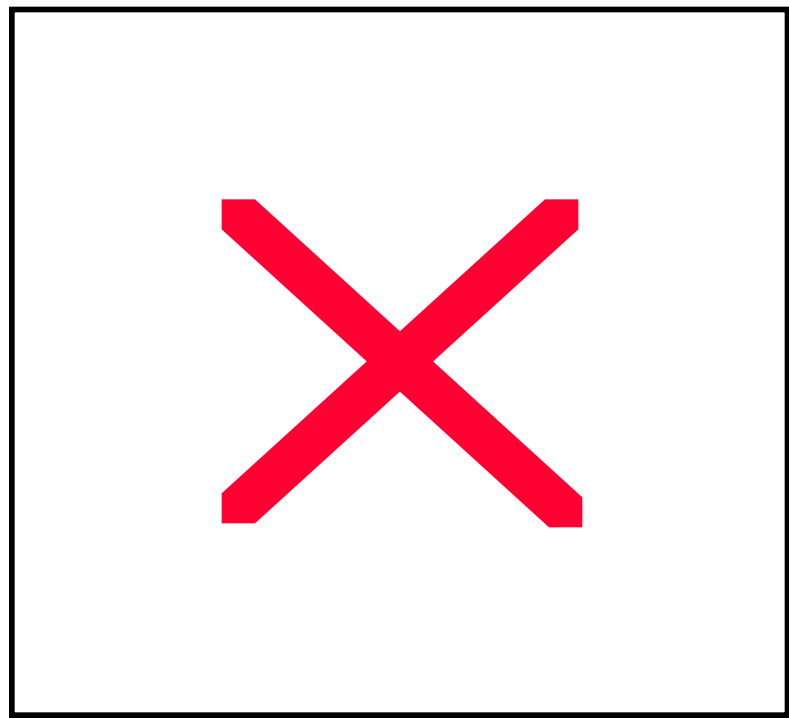
Collaborative Comparisons

- BigFoot Validation Sites -- Warren Cohen
- EOS Land Core Validation Sites -- MODLand Team Members
- Ongoing Training Site Ground Validation -- Regional Experts

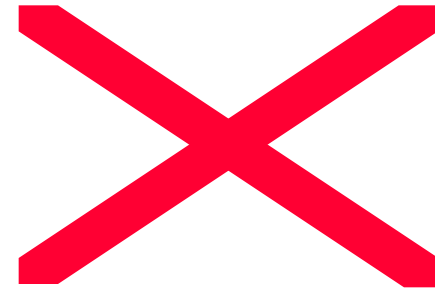
Note: No designated land cover validation scientist



Reprojection of BigFoot
UTM maps to ISIN



Land Cover Comparison Summaries

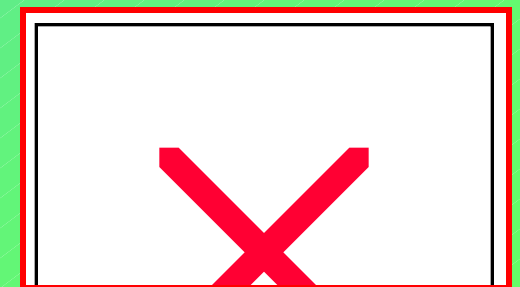


-  BigFoot
-  MODIS

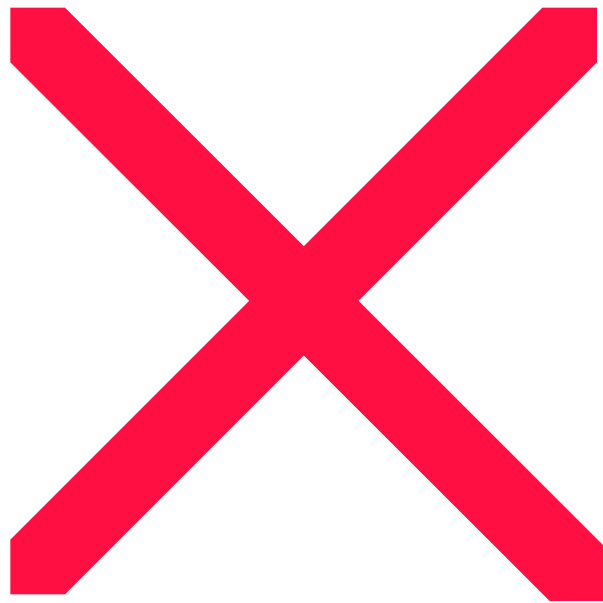
Next Release

- 2001193, 2001289: Anticipate “Validated” status
 - Will use all reprocessed data available (31 Oct 2000 to 1 Nov 2001; 1 Jan 2001 to 31 Dec 2001), thus including full annual phenological cycles
 - Accuracy estimates from cross-validation of training sites will be documented and posted
 - Expect completion of these products in the first quarter of 2002
 - Will include
 - IGBP classes, secondary labels, confidences
 - UMd classes, confidences
 - LAI/FPAR biomes, confidences
 - BGC biomes, confidences

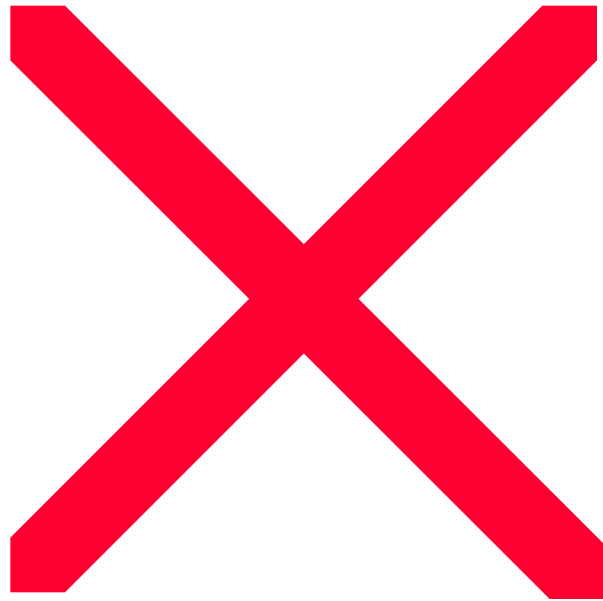
Broadleaf
Needleleaf



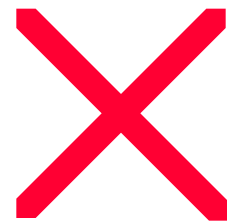
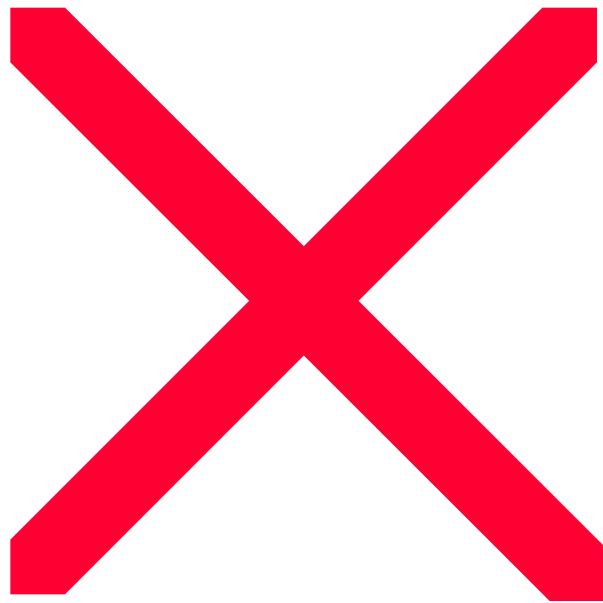
Evergreen
Deciduous



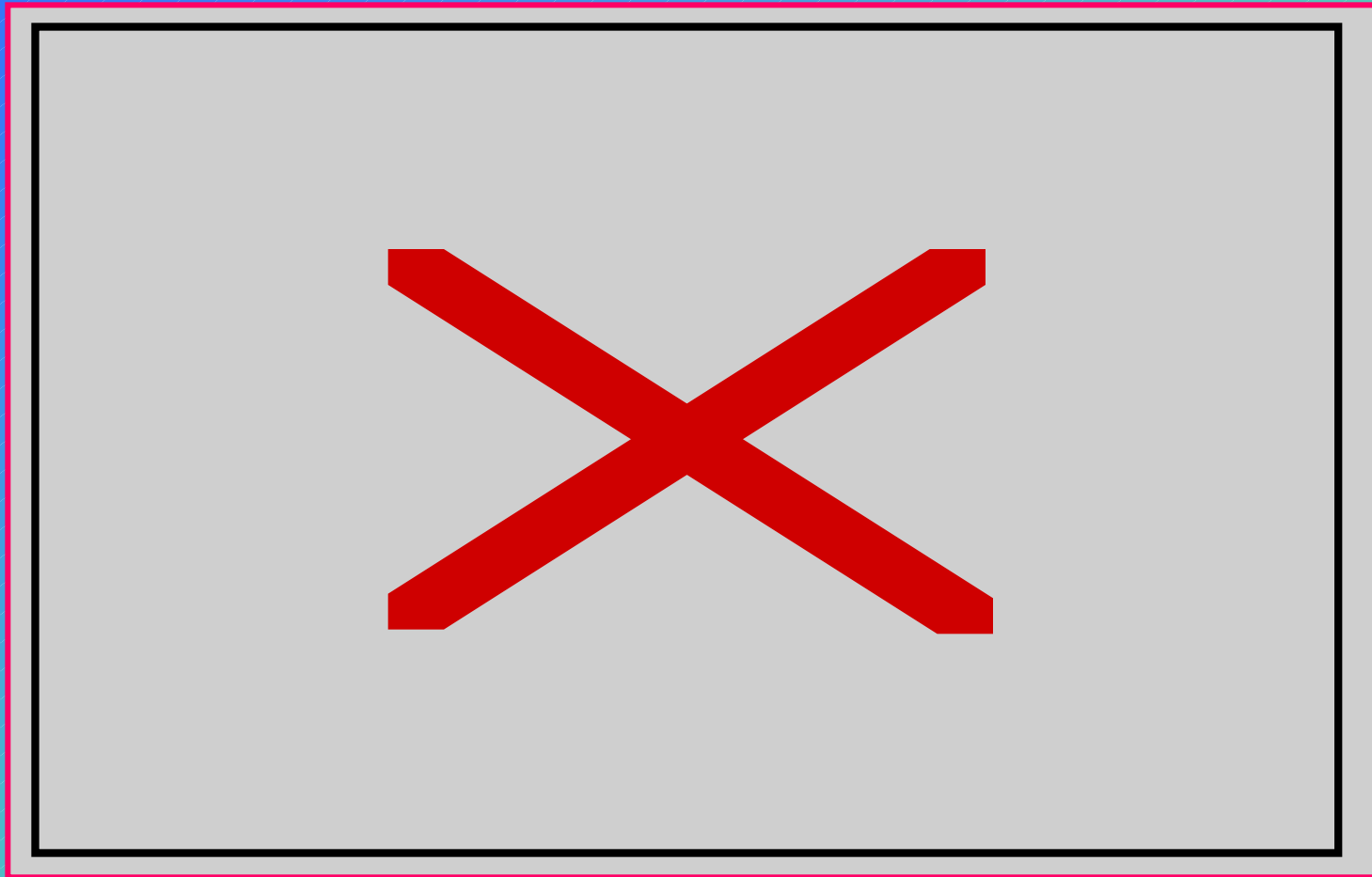
Annual
Perennial



Vegetation Attributes

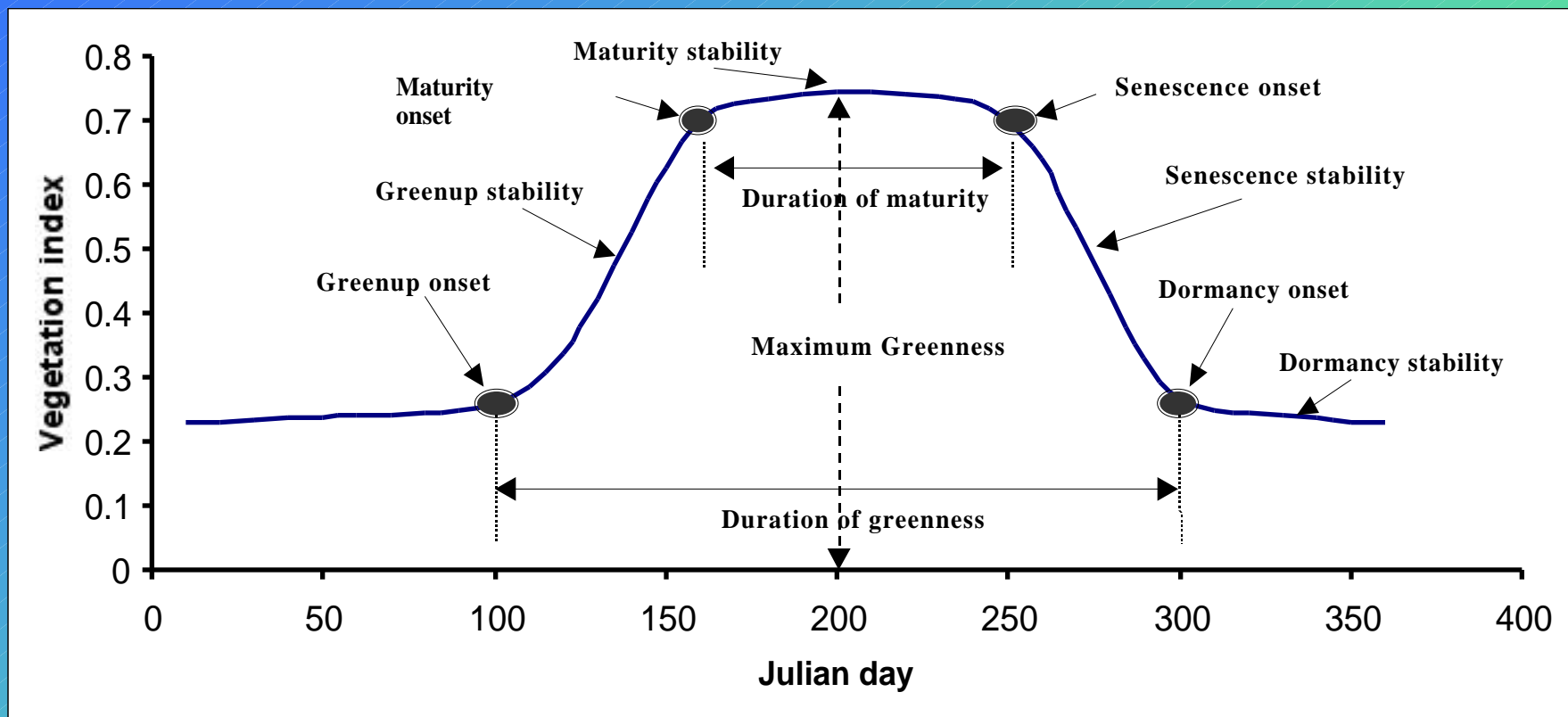


Climate Modeling Grid (CMG)

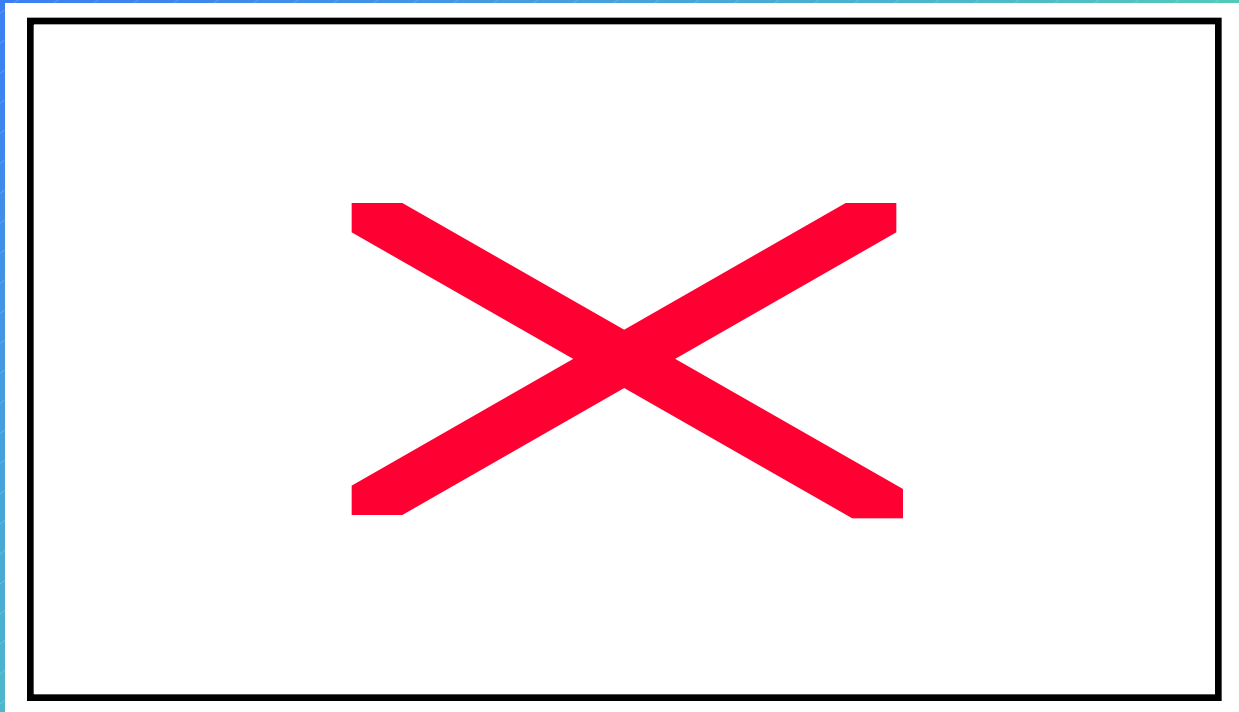


Land Cover Dynamics

Defining Phenological Attributes



Quantifying Phenology



Use extreme points of the change rate of curvature to calculate phenology transition dates from NBAR-EVI

Northeast Phenology

