

Preliminary Classification of Eastern Mediterranean Tree Rings



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THE LABORATORY OF
TREE-RING RESEARCH

UIASCIENCE



79 objects (tree-ring chronologies), each of them characterized by 82-values vector (1919-2000)

How many clusters could be identified?

What time series are included in a particular group?

How can we check the quality of the classification?

Cluster's visualization

Tree clustering

Cluster's structure

K-means clustering

Cluster's verification

Discriminant analysis

Distance measure: **Euclidean distance**
Linkage rule: **Ward method**

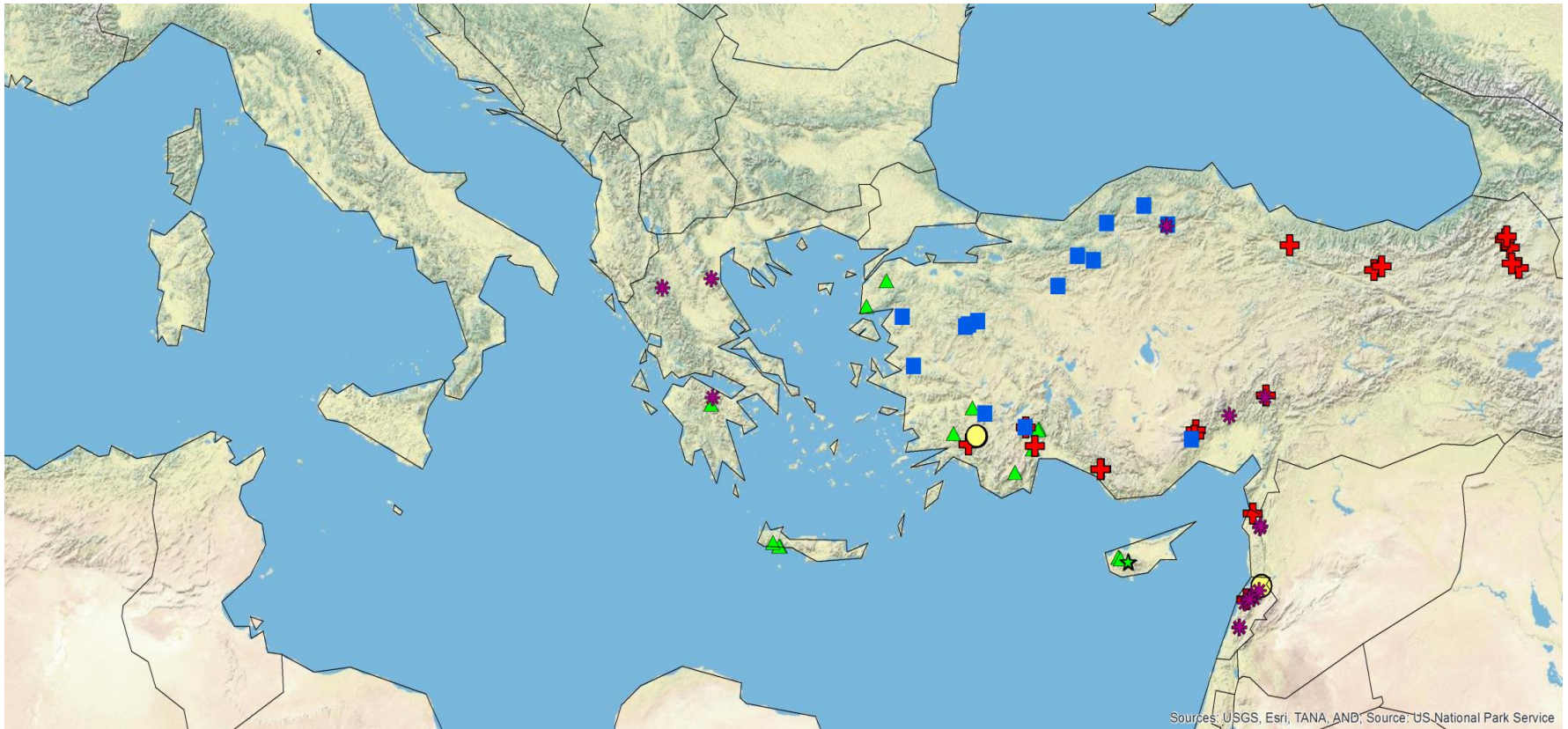
Step-by-step optimization by ANOVA approach

Optimization by F-criteria and Lambda Wilks statistics

Eastern Mediterranean Tree-Ring example



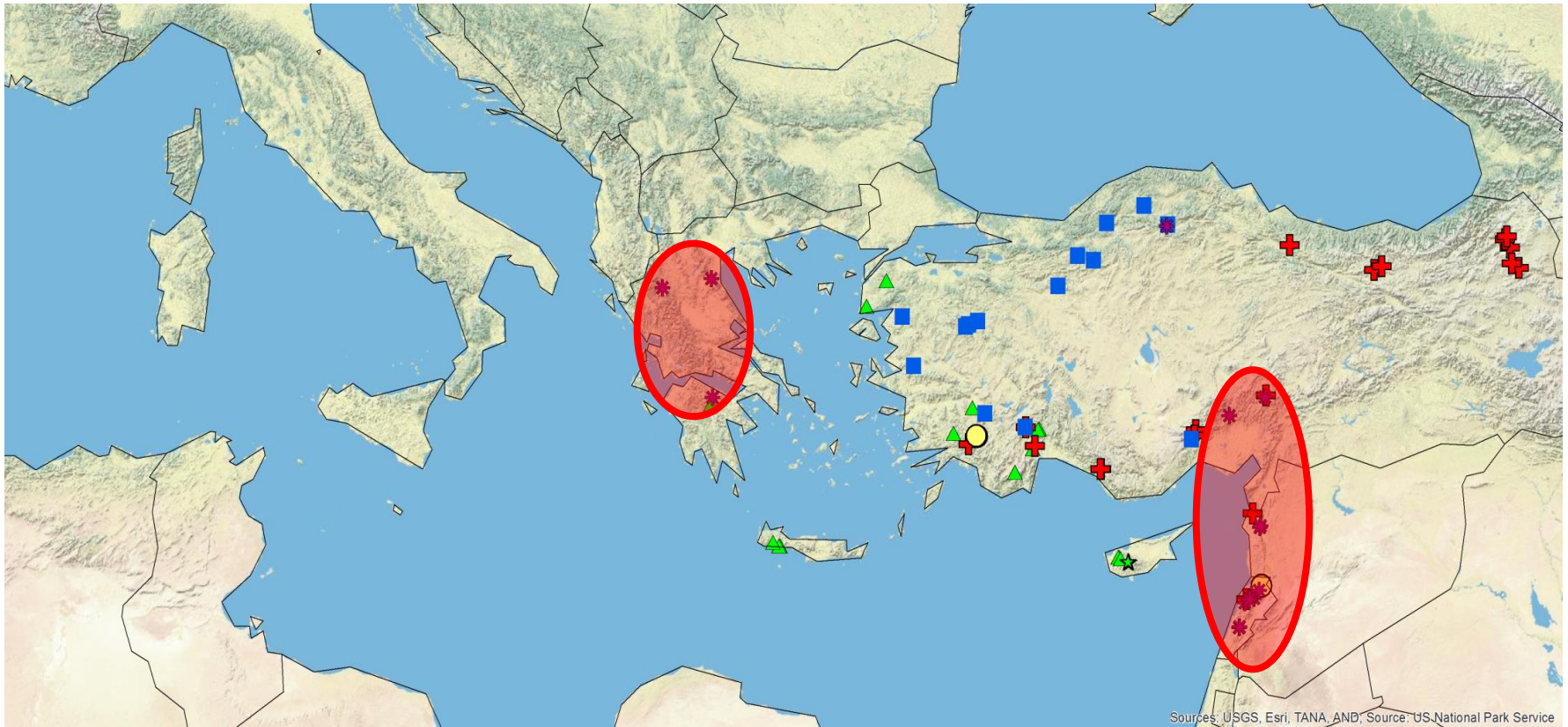
6 clusters



The **discrimination on 6 dendro-clusters** can be characterized by:

- ***Different geographical locations (macro-climate)***
- ***Different tree species***

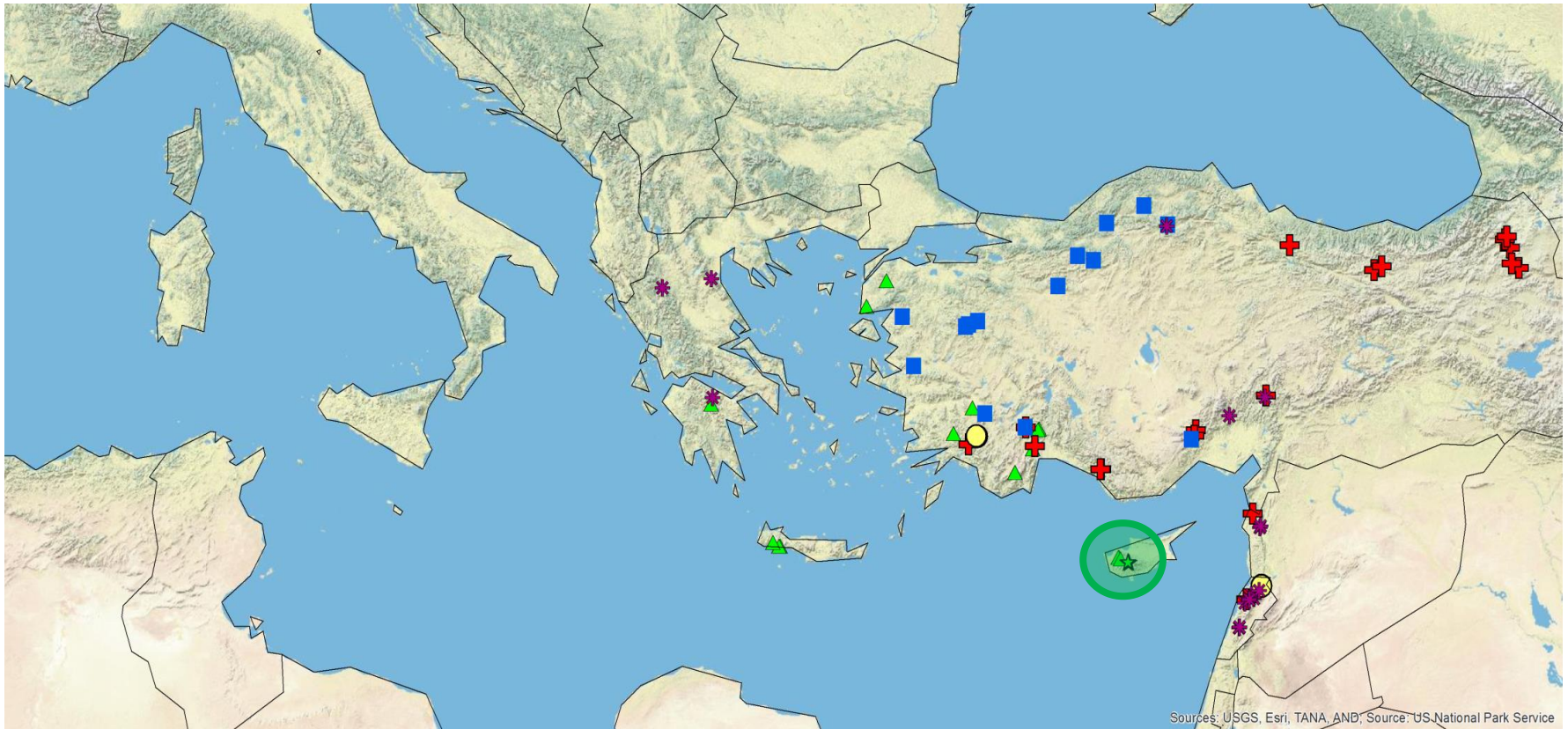
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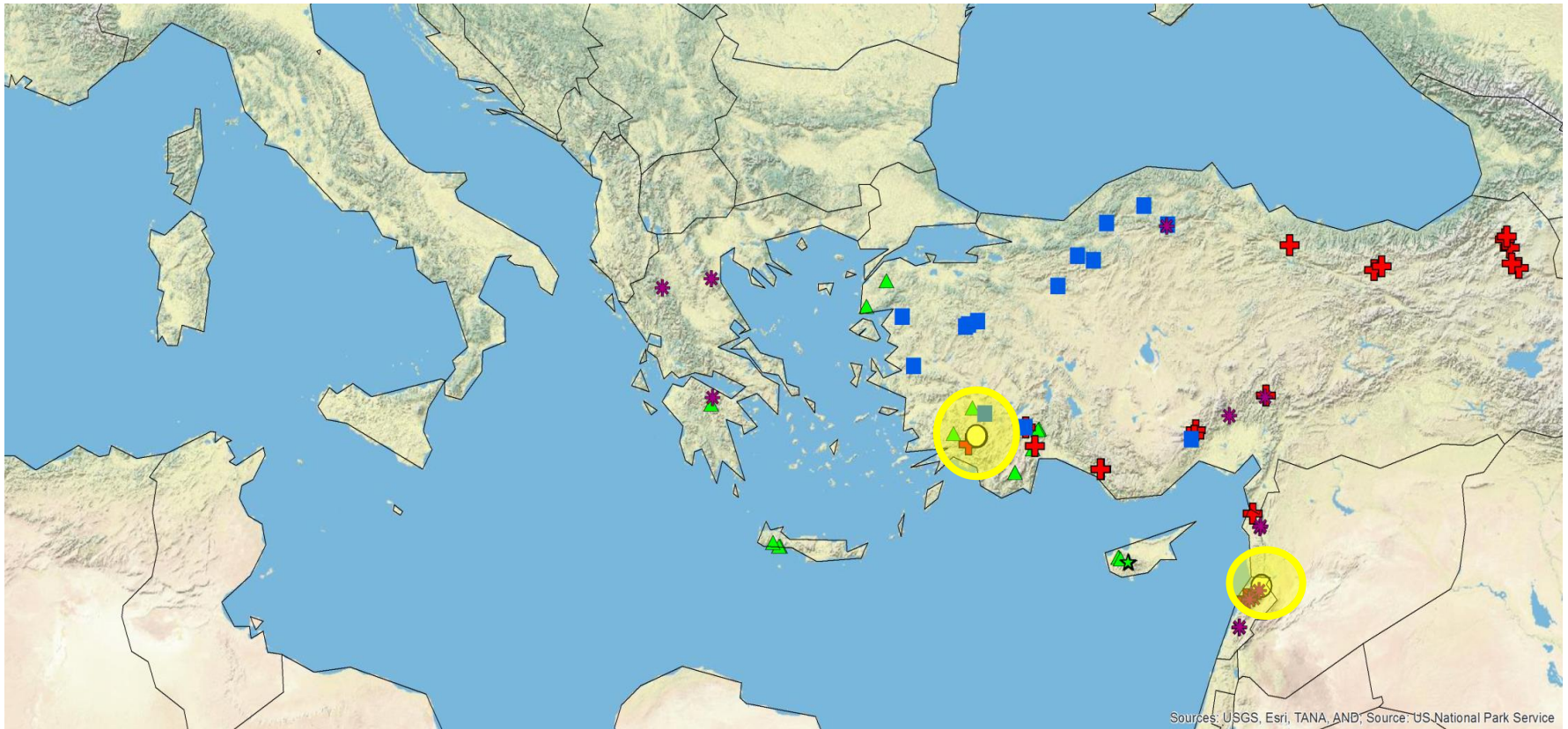
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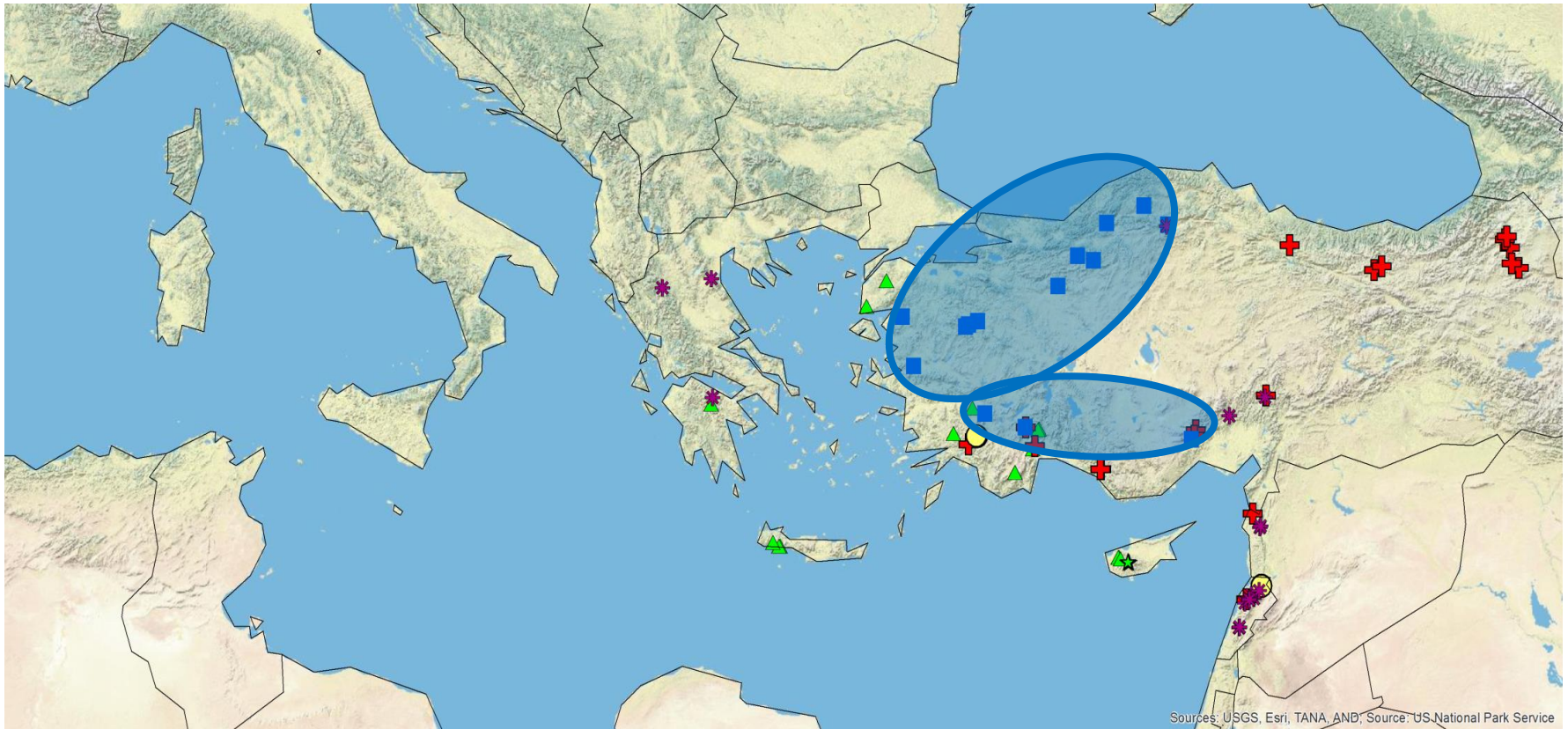
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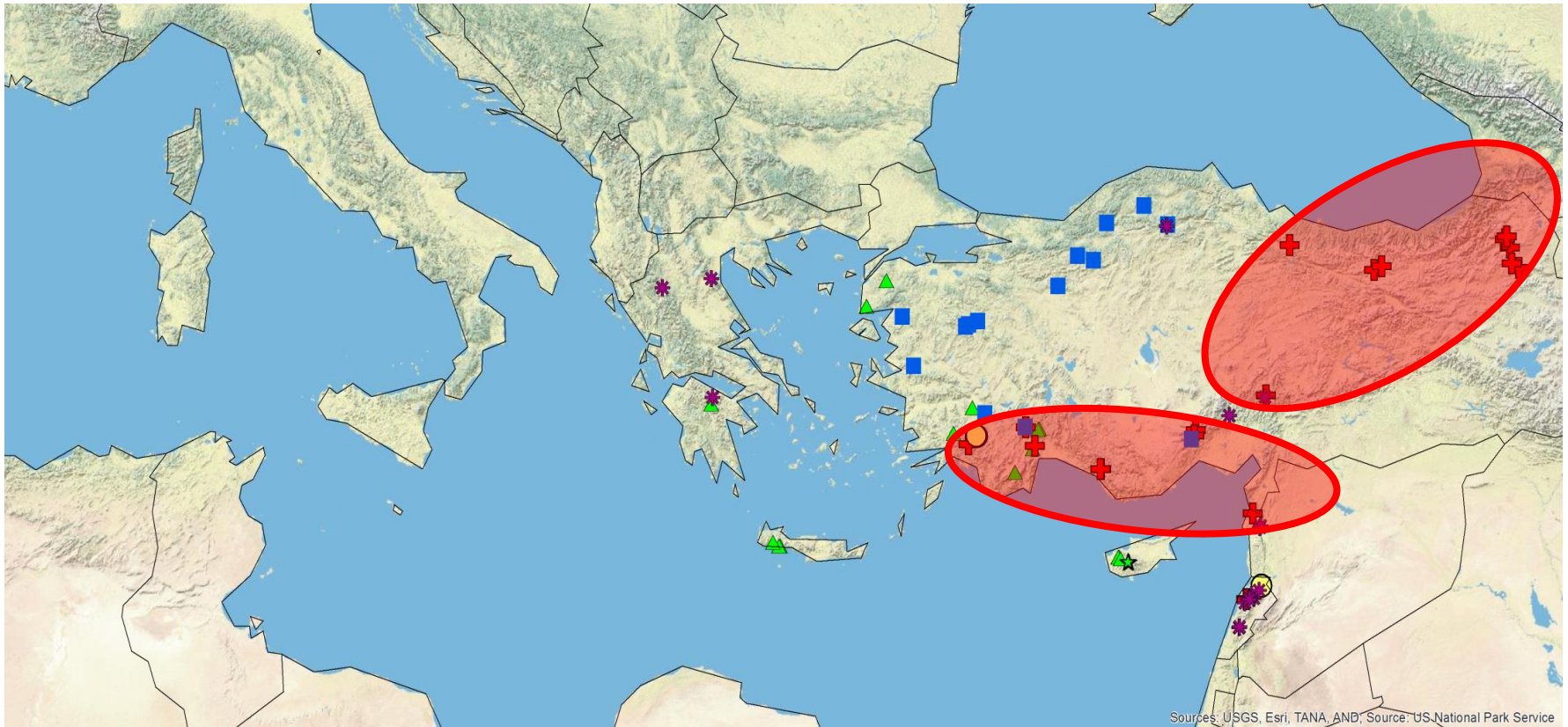
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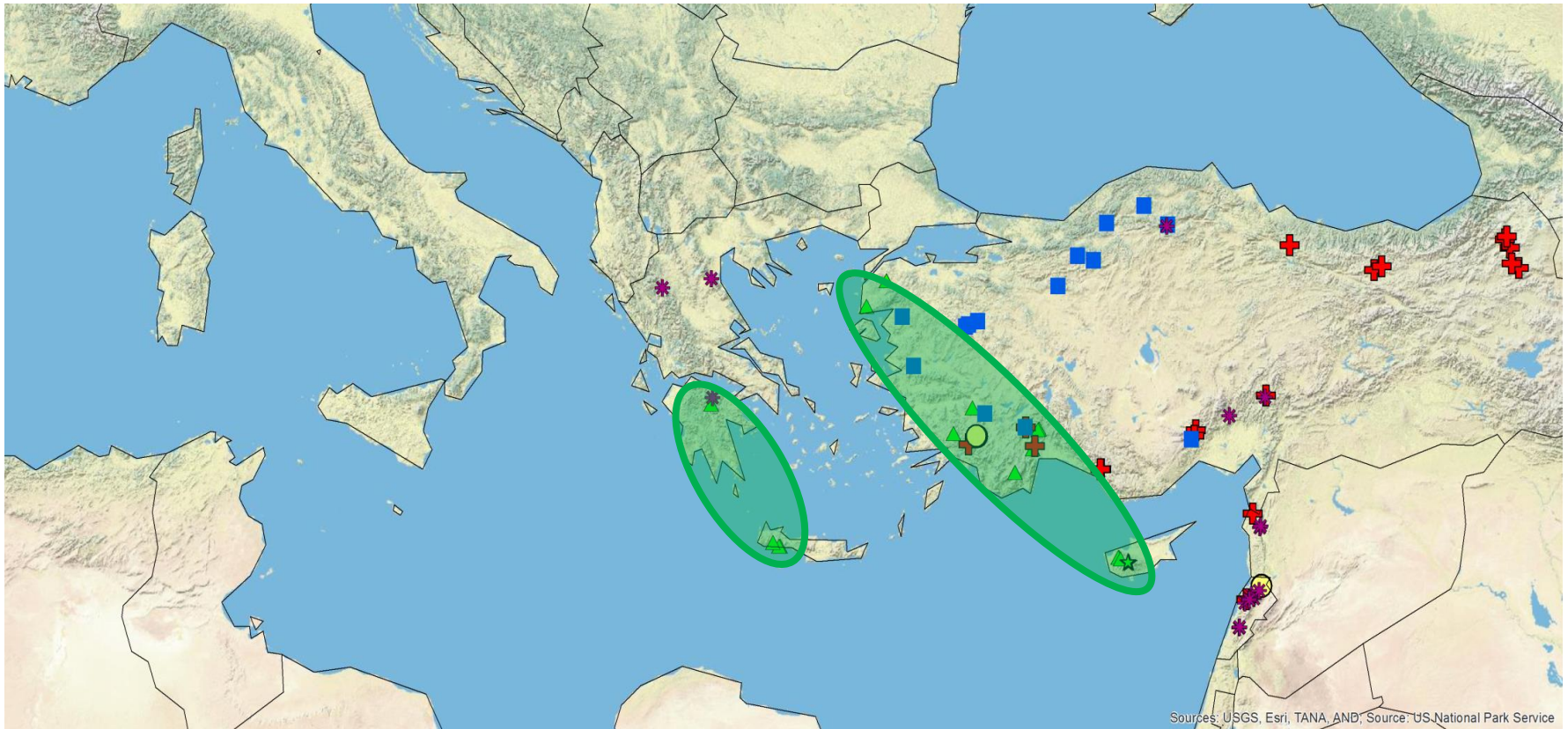
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Perspectives

- ✓ To analyze tree-ring chronologies variation for each cluster by Principal Component Analysis
- ✓ To interpret first PCs for each cluster
- ✓ To identify environmental factors influencing tree-ring growth for certain cluster
- ✓ To reconstruct environmental factors based on obtained PCs and classification approach

Eastern Mediterranean Tree-Ring example



Thank you very much for your attention!

