Degradation or recovery of argan woodlands in South Morocco?

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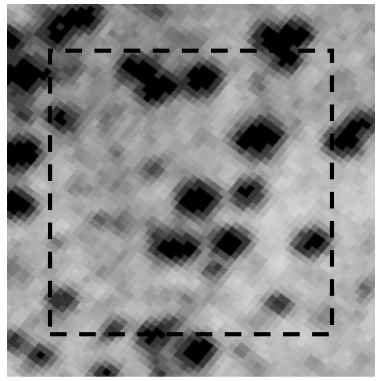
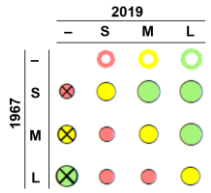
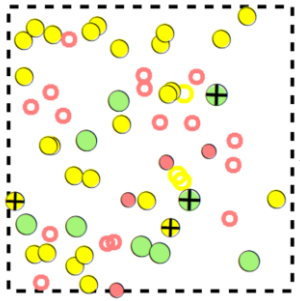
1967 (CORONA)

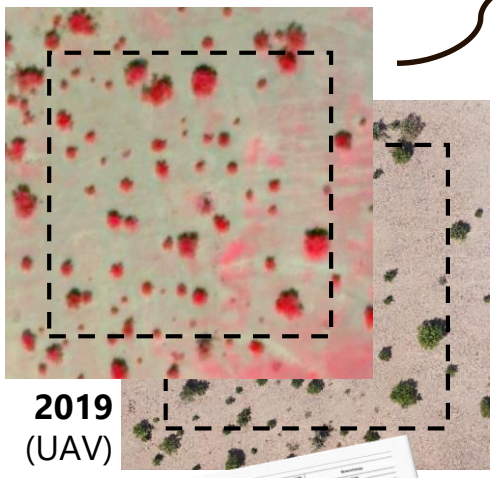




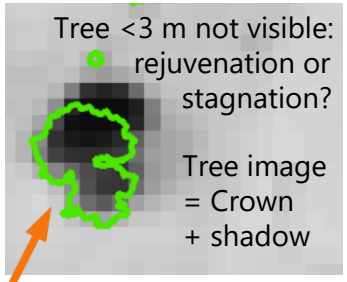
Tree-crown change interpretation and mapping (30 x 1 ha)



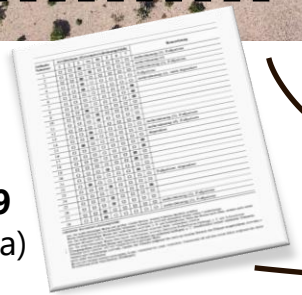
2018 (WorldView)



2019 (UAV)



Learning from UAV-simulated CORONA image

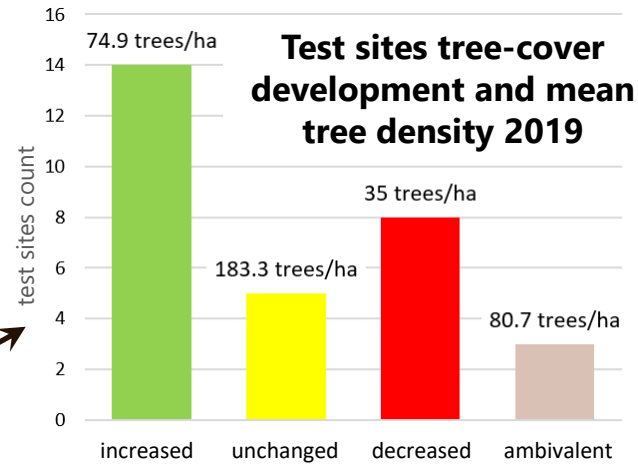


2018/19 (Field data)

Tree-density change 1967-2019

- Optimistic scenario (small-tree rejuvenation): 55→83 trees/ha
- Conservative scenario (small-tree growth stagnation): 87→83 trees/ha
- But: 60% of all trees retain mostly small crown size over 50 years

Classification of 30 test sites (tree-density and crown-size development)

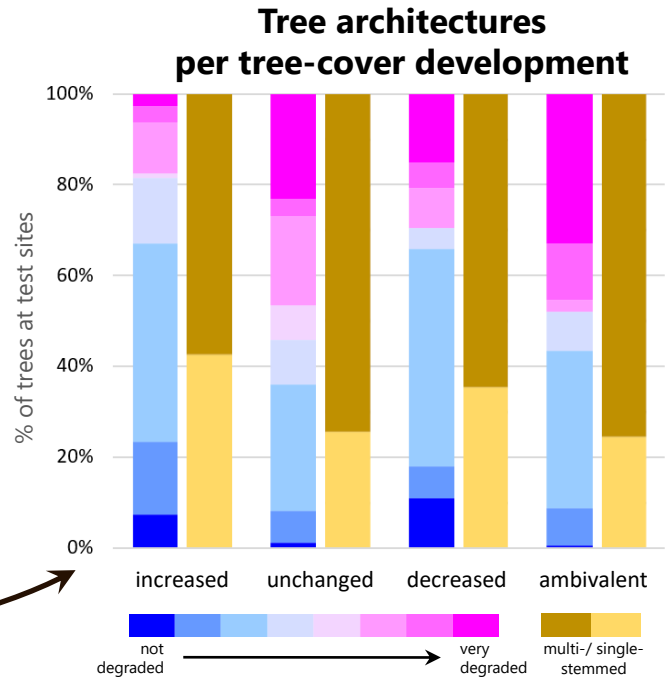


Tree architecture as a measure of livestock browsing, firewood harvesting and felling/re-sprouting

- New small trees (○) and trees with decreased crown sizes (●) show most degraded architecture and >75% multi-stemmed form
- Test sites with unchanged and ambivalent tree-cover development show most degraded architecture and ~75% multi-stemmed form

→Observed tree-cover gain is relative to very high initial degradation

→Satellite-based tree-density change mapping only may underestimate pressures on dryland forests



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