Examining Spatial Heterogeneity and Tourism Potential of Water Resources in New Mexico

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Increasing outdoor tourism in New Mexico and growing demand for water-based tourism amenities requires developing innovative strategies for resource allocation and service integration among many existing and potential recreation locations. Identifying tourism potential and optimizing resource allocation has been addressed in studies using a multitude of models, methods and algorithms; however, variations between the influential factors of tourism locations are best analyzed with a Geographical Information System (GIS) based research model that can examine diverse spatial relationships in these environments. This study uses a Geographically Weighted Regression (GWR) method to illustrate that variables related to drivers of tourism are locally distinct. This tool is used to examine the spatial non-stationarity of relevant water-based tourism variables. Spatial discrepancies are shown to exist in the explanatory variables useful for developing tourism resources in rural and urban locations in the New Mexico study area. This GWR analysis can strengthen the decision process and allow policy makers to identify distinct influential factors and areas where resources for expanding water based tourism should be focused.

Dual Turn-On/Turn-Off Sensing of Acetylacetone and Turn-On Sensing of Water in Organic Solvents

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Metal-organic framework (MOF)-based sensors for the detection of various analyte molecules has been a subject of absolute importance. However, most of these sensors rely on the turn-off (quenching) transduction response, while those reporting turn-on response are very rare. In this article, we have synthesized two new MOF-based sensors, {[Zn2(oxdz)2(tpbn)]¬∑14H2O}n (1) and {[Zn2(oxdz)2(tpxn)]¬∑10H2O¬∑2C2H5OH}n (2), via the self-assembly of Zn(II) metal ions, a fluorogenic oxdz2,Äì linker, and bis(tridentate) ligands (tpbn and tpxn) under ambient conditions. Their formation from such a self-assembly process has been evaluated on the basis of the geometry around the five-coordinated Zn(II), preferential meridional binding of the bis(tridentate) ligands, and diverse binding of the carboxylate groups in oxdz2,Äì. Although 1 and 2 are isostructural, a difference in the transduction mechanism for the sensing of acetylacetone in organic solvents (turn-on for 1 and turn-off for 2) is observed and can be attributed to the spacer in the bis(tridentate) ligands. We have demonstrated the competing effect of the nonradiative interactions and photoinduced electron transfer toward the sensing mechanism. The results are well-supported by the Fourier transform infrared spectroscopy study, intensity versus concentration plots, spectral overlap measurements, time-resolved fluorescence studies, and MM2 and density functional theory calculations. Furthermore, we have showcased the utilization of 1 for the sensing of trace amounts of water in organic solvents.

Comparing the Growth of Xeric Trees in Soil vs. Aquaponics

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In my experiment I was comparing the growth of xeric trees that grow in the southwest in Soil with traditional methods vs. Aquaponics. I felt as though this application could provide a potential solution to fighting climate change, save massive amounts of water, as well as contribute to habitat restoration efforts. As I will also have shown in my poster, I examine in greater detail factors that are common in the field of aquaponics such as PH, EC, N03 concentration and, PAR. I also provide graphed data on growth rate comparison for the height and width of each tree specie. I also provide and discuss data on root mass comparisons between the soil control group and aquaponic group. This is a study that took place over one year from the summer of 2021 to the summer of 2022, I break apart each trial in detail and discuss the different findings of each. I am comparing different methods of cultivation so with in each specie, all of the seeds were sown and dated at the same time.This established a fair starting point to begin measurement of growth comparison between the soil and aquaponic groups. I will demonstrate how I transplanted them into the aquaponics system as well as how I recorded data and cared for them.There are more than several species of trees that grow in New Mexico as well as the surrounding states and Southwest that are included and I examine each one of their growth rate comparisons. I also identify and explain similar growth rate patterns identified in the aquaponics group. I will also discuss methods for a successful transplanting of the trees from a water based media into a soil media including specific media used to help the transition. Overall after all 3 trials, I answered my original questions which were, Can the growth rate of trees be execrated with aquaponics vs. growing them in soil with traditional methods? As well as, Can larger root masses be cultivated while growing trees in aquaponics? The answer was Yes, for both questions and for all of the species in the three trials. I believe that my findings of achieving faster growth rates of trees with aquaponics

has potential to help produce trees faster which has many applications. I will discuss how, this method can be utilized to speed up Habitat Restoration and possibly help curb the effects of climate change by speeding up tree production which was previously thought would take much longer to produce. Aquaculture can be a sustainable form of food in areas that greatly limit food production. I will suggest combining aquaponics and xeric trees could be a game changer for sustainability habitat restoration and sustainable aquaculture.