

## Summary of Ecosystem Science & Policy classes and activities in the Gifford Arboretum & Sustainability Garden:

Fall 2020 semester                      Dr. Terri Hood

ECS classes taught by Terri Hood using the Arboretum proper as an instructional venue are:

ECS 111 Intro to Earth's Ecosystems

ECS 415 Research in Private Urban/Suburban Green Spaces

ECS 111 students each have adopted a particular tree in the Arboretum (27 trees total). During biweekly visits over the course of the semester students have been making phenology observations on such plant activities as new leaf flushes, flowering and fruiting. Interactions with wildlife are recorded as well as nature and quantity of epiphytes on the trees. Students are performing online investigations of below-ground relationships (with bacteria and fungi) as well as ethnobotany (ways in which tree components have been used by humans). Student summaries of their trees will be shared with Arboretum Director Galetti.

ECS 415 students have been continuing biweekly visits of the trees on our Edible Trail (a 80-member collection of trees and shrubs in the Arboretum having edible fruit, leaves or roots). These biweekly visits began Jan 2020; once a year's worth of observations are assembled a 2020 phenological chart will be included into an Edible Trail booklet that can be shared with the Arboretum community.

Classes using the Arboretum Sustainability Garden as an instructional venue during the Fall 2020 semester are:

ECS 111 Intro to Earth's Ecosystems

ECS 215 Intro to Private Urban/Suburban Green Spaces

ECS 401 Environmental Internship

ECS 405 Special Projects in Ecosystem Science & Policy

ECS 415 Research in Private Urban/Suburban Green Spaces

Students in the ECS 111 class worked to develop the Alternate Turf walking spaces by selective removal of undesired components; desired components remaining are a suite of mostly-native wildlife-supporting ground covers including *Phyla nodiflora* (Creeping Charlie), *Sida ulmifolia* (Wireweed), *Desmodium* sp., *Lepidium virginicum* (Virginia pepperweed), *Bacopa monniera* (Brahmi tea) and *Calyptocarpus vialis* (Straggler daisy).

Students in the rest of the courses worked to maintain and further develop the 4 different types of garden beds: 1) the mounded Global Student Farm beds, 2) free-form limestone boulder-edged Sustainable Suburbia perennial beds, 3) block-edged geometric trial beds and 4) plastic-lumber-edged vine planters adjacent to the bordering wall. Projects included soil-building, weeding (of course!), planting seeds and transplants, harvesting and use of garden components, and development of "hardscape" and simple signage. Soil-building used a variety of materials that would have otherwise been tossed: these included shredded tree trimmings from on-campus, fallen decomposing wood from the Arboretum acting as mini-hugelkultur, composted kitchen scraps, coffee grounds from Starbucks (further detailed below), as well as diverse mineral sands from around the world (also described below). Hardscape development included emplacement of rescued oak

trunk sections for seating and establishment of a small pond using a discarded chemistry sink. New plantings included strawberry planters made from discarded plastic crates, new flowering plants in the pollinator section of Sustainable Suburbia, pineapple tops discarded from the Farmers' Market, and seeds of multiple cool-season annuals in the trial beds. We also have begun a demonstration alternate hedge section of moringa, katuk and bamboo.

In collaboration with an ECO-Agency team of "coffee-runners" delivering spent coffee grounds from the on-campus Starbucks to the garden, students enriched both the garden beds and the alternate turf walking surfaces with coffee grounds.

During the previous Fall, students in the 2019 ECS 301 "Quantitative Methods in ECS" class analyzed the mineral composition of 38 beach/river/desert sands from around the world for their potential to release plant nutrients and alter to useful clay minerals (both functions that our local calcite + quartz minerals do not perform). This semester the students "released" the approved sands into the garden beds, beginning our project to simulate a fertile river floodplain environment mineralogically.

As always, visitors are welcome to come wander through the Sustainability Garden, visually enjoy and study the plants and projects, and interact with the students working there. We only ask that everyone respect the ongoing projects and leave materials (living and otherwise) intact.