

## SWES 2021 STRATEGIC PLAN

### SWES Purpose:

To provide knowledge, skills, tools, and awareness pertaining to environmental quality and human-environment interactions in order to improve and sustain the function of environmental systems and protect human health.

### SWES 2021 Vision:

The Department of Soil, Water and Environmental Science (SWES) comprises breadth and depth of expertise in research, teaching and extension of environmental science, defined here as basic to applied science of the Earth's terrestrial surface – including regions affected by human activity. SWES focuses on that portion of the Earth's near surface termed the “critical zone” that extends from the lower atmospheric boundary to the lower depth of circulating groundwater, and which includes vegetation and/or urban infrastructure, soil, sediment, vadose and saturated zones. Our vision of SWES includes:

- Research, teaching and extension programs that are Land Grant mission-driven to address societal needs pertaining to problems of agricultural production, water quality, natural resource management, and environmental remediation, in a rapidly changing world.
- Programs that are natural-science-based and address direct rural, urban, and industrial systems. A departmental theme is a systems perspective that integrates fundamental concepts of physics, chemistry and biology in applications to the environment. SWES research and degree programs are therefore grounded in a strong basic science curriculum that represents the foundation for focused studies in environmental physics, chemistry and/or biology.
- A cross-section of faculty, staff and students that represent unparalleled capacity to address emerging environmental issues of local to global significance, including climate change, contaminant remediation, and the sustainable management of land and water resources. SWES personnel conduct a wide range of extramurally funded research on issues of importance, focusing especially on Arizona, the Southwest and other semi-arid and arid regions of the globe where reciprocal interactions between environmental and human health are profound.

### SWES Mission:

It is our central mission to provide:

- Training and education for future generations of scientists, land and water resource managers, engineers, agricultural producers, and policy makers to address a wide range of issues facing environmental systems and their intersection with human health and well-being.
- Relevant and innovative information and communication to aid in sustainable management and decision making involving increasingly stressed land and water supplies in that state, nation and world.
- Technical expertise for addressing critical zone and environmental issues (including contaminant remediation, sustainable food production, soil and water quality) in rural and urban centers and the rapidly changing interfaces between them.

### SWES Shared Values:

Critical zone science, and soil and water quality, along with their relation to human health and well-being and sustainable land and water management, will continue to be the primary focal areas for training, research, and service/extension/outreach activities of the Department.

**STRATEGIC GOAL ONE: Continue to be recognized as premiere unit in Environmental Science at the UA, nationally, and internationally.**

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

There is a significant emerging need to quantify and understand human-environment interactions at local to global scales in order to maintain environmental system function and human health and well-being. Funding agencies recognize this need and increasingly support large inter- and trans- disciplinary research programs that span basic to applied, and research to education and extension program continua in order to address grand scientific and societal challenges in the areas of land, water and environmental quality and sustainability. Given our focus on land-water systems and interactions strongly impacted by human activity, SWES has the expertise and experience to lead and/or collaborate on these types of projects.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Maintain SWES as a leader in UA-wide and multi-institutional, inter- and trans-disciplinary efforts that collectively span basic-applied-research-extension-education continua to address grand challenges in land, water and environmental quality and sustainability
2. Enhance research capacity and resource base by pursuing faculty development and funding opportunities at the intersection of environmental and human health
3. Expand SWES activities in resolving and communicating the roles of climate and land-use change, increased urbanization, and energy production on water resources, agricultural soil and water management, food safety, and environmental remediation

**C. Actions**

Time Period (Fiscal Years)

- |  |                |
|--|----------------|
| • Develop topical research centers   | FY13 - onward  |
| • Hire faculty in targeted areas of research and extension                       | FY15 – onward  |
| • Curriculum development in environmental science                                | FY12 – onward  |
| • Translate to broader group of stakeholders SWES activities and accomplishments | FY 13 – onward |

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Physical infrastructure for housing large project personnel, students and collaborators
- Business office function that is enabled to facilitate multi-unit projects
- Extramural and State support for cutting-edge analytical and multi-user facilities
- State support for SWES faculty replacements and hires
- Stakeholder in-reach on perceived research and extension needs

**E. Objective metrics that will be used to track progress towards attaining goal**

1. Number and size of large, inter- and cross-department grants
2. Publications, including for stakeholder outreach as well as in peer-reviewed journals Student numbers and success
3. Departmental ranking in Environmental Science
4. Number of stakeholder events and interactions involving faculty

**Notes (if any)**

**STRATEGIC GOAL TWO: UA leader in the direction and provision of the Environmental Science B.S. degree program.**

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

SWES was the first and only unit on campus to develop a rigorous, quantitative, and basic science based degree program in Environmental Science. SWES needs to maintain and expand its role as the leader in the direction and provision of this program.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Enhance pedagogy of a systems-level approach to environmental science
2. Translate efficiently new knowledge and tools into the curriculum
3. Provide a complement of foundational depth in parent disciplines with effective integration and applied coursework to provide an education that meets future societal demand for solutions to complex environmental problems
4. Update and assess student outcomes, goals, and achievements in a consistent way
5. Provide outreach to and interact with Arizona high schools and community colleges for student recruitment and curriculum coordination

C. Actions	Time Period (Fiscal Years)
• Pro-active engagement of allied units offering environmental science-related coursework (e.g., SNRE, SEES departments)	FY13 - 15
• Enable multi-unit participation in the Environmental Science major	FY14 - 16
• Enhance student recruitment activities by developing effective linkages with and/or providing assistance to school districts across Arizona	FY13 - 15

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- Recognition via novel approaches to student credit hours of multi-unit participation in Environmental Science focal areas.
- Incorporate the wealth of UA-wide activities in environmental science into an exciting, cohesive and dynamic major for UA undergraduates that exposes them to the breadth and depth of the field (as it occurs at UA like nowhere else).

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. Number of students enrolled in the ENVS degree program
2. Success of undergraduates following graduation
3. Quality of undergraduate performance

**Notes (if any)**

**STRATEGIC GOAL THREE: Direct robust and productive Environmental Science education program for the development of the next generation of professionals and leaders.**

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

SWES undergraduate and graduate programs are focused mainly on serving traditional on campus students. There is a growing opportunity to provide continuing education and/or degree programs to working professionals seeking to enhance environmental science skills. SWES is poised to directly address the needs of these non-traditional students through development of instructional programs to reach these students.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Enhance outreach and enrollment of non-traditional students in SWES programs
2. Enhance interdisciplinary research and education opportunities
3. Develop instructional structures to facilitate non-traditional student education
4. Increase teaching efficiency by focusing certain teaching efforts on online courses

C. Actions	Time Period (Fiscal Years)
• Develop professional degree programs	FY13 - 15
• Develop online course materials	FY13 - 15

---

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- IT and technical assistance for effective online course development (such a resource would be of benefit to units CALS-wide)
- Effective marketing to non-traditional students of SWES expertise and curricula
- Continued incentives to the Department for developing and offering online courses
- Scholarship support for non-traditional students

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. Number and quality of students in SWES degree programs
2. Number of non-traditional students
3. Number of online courses and enrollment
4. Measures of SWES graduate success following graduation

**Notes (if any)**

**STRATEGIC GOAL FOUR: Develop departmental endowment to support at least six faculty positions and programs.**

**A. Current situation (i.e., problem to overcome/opportunity to capitalize on) and gap between current situation and desired situation**

SWES requires strategic faculty positions to achieve the vision and objectives discussed above, where we have identified targeted programmatic areas in soil, water and environmental science that have potential to be well funded extramurally, while also supporting the UA's land grant mission. Given the diminishing fraction of UA's budget provided by State of Arizona support, to facilitate development of these positions and to strengthen ties with local and national stakeholders, SWES will pursue external endowment support.

**B. Strategy/ies to achieve goal (list if more than one)**

1. Cultivate relationships with key stakeholders in Arizona and the nation who recognize the importance of SWES activities in research, teaching and extension
2. Effectively publicize the research, teaching and extension activities of SWES to expand the base of departmental support

**C. Actions** **Time Period (Fiscal Years)**

---

• Identify new stakeholders served by SWES programs	FY 13-15
• Develop enhanced public relations to publicize SWES activities	FY 13-15
• Develop contacts and outreach to identified stakeholders	FY 14-16
• Involve SWES alumni and friends in new department activities	FY 13-15

---

**D. Inputs needed to achieve the goal (do not limit to financial inputs)**

- University and college level support ensuring endowment funds procured by SWES directly support SWES

**E. Objective Metrics that will be used to track progress towards attaining goal**

1. Number of endowed chair positions in SWES
2. Amount of private funding donated to SWES
3. Number of news and online articles written about SWES activities and research
4. Number of stakeholders contacted for requests for potential support

**Notes (if any)**