Moving Forward

1. It was generally agreed that the tasks outlined for the specific teams in the last meeting (see minutes of that meeting) were appropriate and necessary.

2. Students need to contact and meet with the faculty or staff advisors of their specific team soon to begin working on specific tasks.

3. It was also agreed that one of the first key tasks is to identify sources of existing information that relate to your team’s identified tasks. Again, your faculty or staff advisor can help you with this task.

4. Individual team meetings should be weekly and should meet outside of the regularly scheduled time for the overall P3 team meeting.

5. The new overall P3 meeting time will be every other Monday at 3:30 PM.

Derek Chow, New Resource Person

Derek Chow of the US Army Corps of Engineers is director of the Ala Wai Canal Restoration Project. He has offered to help students with specific tasks on water quantity, quality, and planning and permitting. He issued an open invitation for students to attend meetings of the AWCRP to learn more about the overall issues concerning storm water runoff and stream water quality. Derek’s email is: derek.j.chow@usace.army.mil. Examples of the types of data he can provide are:

1. LiDAR, very high resolution topographic information for the Ala Wai watershed, including the drainage basin for our storm pipe.

2. A storm drain inventory, so we can better delineate the inflow points of the storm drain.

3. Total maximum daily loads (TMDL) standards for pollutants and effluents

Getting Started on Major Tasks

There was much general discussion about the kinds of activities that need to be completed during this semester to work toward an effective design for the constructed wetland. These generally followed the tasks outlined in the last meeting. For students to begin working on these tasks, they need to contact the faculty advisors and other resource person.

Project and Study Plans

At this meeting, it was agreed that students on particular teams need to meet with each other and consult with the faculty advisors to formulate a study plan for the coming semester.

Student Involvement

This is intended to be a student-led project, with appropriate faculty advising and leadership. As you can see below, we already have a number of students and faculty committed to participating, but there is room for additional students in particular areas. We are offering students credit for their work on this project in a number of ways.
1. NREM 399/499: Directed Study (var cr).  
This provides students opportunities to learn by doing. Students must have a faculty sponsor in NREM.

2. NREM 494: Environmental Problem-Solving.  
This is the senior capstone course in NREM. Carol Ferguson, who has been the instructor for the course during the past 2 years, will allow students to use their involvement with the P3 project as a substitute for the regular requirements of NREM 494.

3. BE 481/482: Senior Engineering Design I/II.  
This is the senior design course for Bioengineering students. The instructor, Dr. Loren Gautz, is encouraging students to participate in the P3 project to meet the course requirements.

4. Class projects (various).  
There are several other NREM courses in which a class project is part of the course requirements. We will be encouraging instructors to either adopt the P3 project as the designated class project topic or allow students to choose to work on the P3 project to meet the course project requirements (see list below).

**Partners**

We have several important partners inside and outside of the university. The NREM and MBBE departments in our college have faculty and students committed to participating in the project. Dr. Eric DeCarlo in Oceanography has agreed to train students on how to conduct water quality testing and make his laboratory facilities available for analysis of pollutant levels in storm water runoff. Roxanne Adams, the head of landscaping on campus, has been involved with selection and propagation of native plants for use in the wetland. Dr. Pauline Chinn in the College of Education and Dr. John Cusick at the Environmental Center, have agreed to work with us on educational outreach activities. Rochelle Mahoe, principal of Noelani Elementary School, will work with her teachers and students to help us collect weather data important for determining potential runoff rates into the storm drain. Derek Chow of the Army Corps of Engineers, has agreed to work with us to identify the most serious pollutants, develop effluent standards, and work with the City and County on planning and permitting requirements.

**Project Outline**

### Water Quantity

**Faculty Advisors:**
- Loren Gautz, MBBE
- Travis Idol, NREM

**Students:**
- Kaori Caraway, NREM

**Activities:**
- Develop digital elevation model of drainage area
- Collect weather data (primary and secondary)
- Measure drain flow rates
- Determine runoff potential

### Water Quality

**Faculty Advisors:**
- Travis Idol
- Eric DeCarlo, Oceanography
- Loren Gautz

**Students:**
- Becky Mitschele, NREM
- Vera Corte Real de Oliveira, NREM

**Activities:**
- Collect water samples
- Water quality training
- Laboratory analysis
- Determine effluent standards
**Plants and Substrate**

*Faculty/Staff Advisors:*
- Travis Idol
- Roxanne Adams, Landscaping

*Students:*
- Cynthia Nazario-Leary, NREM
- Alyssa Cho, NREM

*Considerations:*
- Plant density
- Plant species composition
- Appropriate rooting substrate
- Water regime and flooding tolerance
- Pollutant tolerance and potential for decontamination or sequestration

**Wetland Design**

*Faculty Advisor:*
- Loren Gautz

*Students:*
- Devin Takara
- Edward Mihlbauer

*Considerations:*
- Water cycle
- Size
- Depth
- Type
- Retention time
- Number of cells
- Inflow/outflow rates
- Pollutants of interest

**Economics**

*Faculty Advisors:*
- Loren Gautz
- Carol Ferguson, NREM

*Students:*

*Considerations:*
- Cost of construction
- Benefits of treatment
- Analysis of alternative treatments

**Planning and Permitting**

*Faculty Advisor:*
- Carol Ferguson

*Students:*

*Considerations:*
- Official permits needed or recommended
- Community standards, preferences, and concerns

**Educational Outreach**

*Faculty Advisor:*
- Pauline Chinn, School of Education

*Students:*
- Vernelle Oku
- Cynthia Nazario-Leary

*Major Duties:*
- Develop educational program and materials for the following groups:
  1. k-12 students
  2. k-12 teachers
  3. UH students
  4. Manoa community members and leaders (Neighborhood Board)
- Activities for Phase I should seek to involve the identified groups in the planning process, as appropriate.
- Activities for Phase II should focus on:
  1. developing plans to involve the identified groups in the implementation process
  2. educational presentations, tours, etc. about the finished wetland
**Class Partners**

There are several courses in NREM and CTAHR that may want to involve their students as part of a class project. Courses and instructors are listed below. Dr. Idol will contact the instructors.

<table>
<thead>
<tr>
<th>Course</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>NREM 477: GIS for Resource Managers</td>
<td>Tomoaki Miura</td>
</tr>
<tr>
<td>NREM 494: Environmental Problem-Solving</td>
<td>Carol Ferguson</td>
</tr>
<tr>
<td>BE 481/482: Senior Engineering Design I/II</td>
<td>Loren Gautz</td>
</tr>
<tr>
<td>NREM 600: Evaluation of Natural Resource Management</td>
<td>Ali Fares/Travis Idol</td>
</tr>
<tr>
<td>NREM 665: Coastal and Wetland Ecology and Management</td>
<td>Greg Bruland</td>
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