A video from CSU Fresno discussing faculty and student perspectives on integrating CBL into chemistry is available at:

http://www.calstate.edu/cce/stem/learnandserve/products.shtml#chemistry

**Saitta, E.K.H., Bowdon, M.A., Geiger, C.L. (2011). Incorporating service-learning, technology, and research supportive teaching techniques into the university chemistry classroom. *Journal of Science Education and Technology, 20*, 790-795.**

In this article, the authors outline two CBL projects done with chemistry students at the University of Central Florida that resulted from the “Engaging STEM Initiative at UCF.” This initiative was created to increase the use of CBL in STEM fields. The authors begin by addressing some of the reasons why STEM faculty might hesitate to use CBL and how technology might mitigate some of the logistical issues associated with CBL. The literature review suggests that some commonly-used CBL projects in chemistry include those that involve collaboration with K-12, involve improvement of scientific literacy in the general public, and investigate scientific issues that impact society.

The first project was organized around clarifying high school chemistry students’ misconceptions about chemistry principles. In this project, Chemistry I students at UCF taught high school chemistry students via web conferencing. Research was initially done to determine common misconceptions students have when learning chemistry. The high school students were then interviewed to gauge their misunderstandings in these areas. Clips of these interviews were available to the UCF students so that they could prepare their teaching sessions accordingly. The UCF students then used the refutational text approach to teach the high school students and clarify their misconceptions. This process benefitted the high school students as they were eager to learn from college students and to use technology in their learning. The UCF students benefitted by being able to use a more active learning approach in their chemistry class.

In the second project, Chemistry II lab students taught a kinetics lab to AP high school chemistry students. This project also used videoconferencing to minimize logistical challenges. The UCF students participating in the project ultimately learned the material significantly better than those students who learned by the traditional lab approach (as demonstrated by grades that were 2 letter grades higher on average).

**Sutheimer, S. (2008). Strategies to simplify service-learning efforts in chemistry. *Journal of Chemical Education, 85*, 2, 231-233.**

Sutheimer begins by discussing the challenges of utilizing CBL in chemistry courses and then offers strategies to simplify CBL. One of her primary suggestions is to use simple, short projects. She offers examples of simple, short projects such as collecting water samples from a watershed with an introductory chemistry lab class or using the college as the community partner. The college can be a community partner by monitoring campus water quality, determining soil chemistries on college grounds, or sorting through recyclable plastics to learn more about polymers and plastics. She also suggests having college students teach chemistry concepts to pre-college students.

**Draper, A.J. (2004). Integrating project-based service-learning into an advanced environmental chemistry course. *Journal of Chemical Education, 81*, 2, 221-224.**

Draper’s literature review describes specific examples of service learning projects that can be incorporated into the sciences. She then uses the literature to make an argument why faculty should consider incorporating CBL into their classes. The remainder of the article describes an advanced environmental chemistry course at Bucknell University that incorporated community-based learning. The five projects done by students included: an analysis of gasoline contamination in the soil, an analysis of exposure to environmental tobacco smoke in restaurants and bars, assessment of water quality, an analysis of drinking water quality, and assessment of particulate matter sources. Included in the article is a detailed description of the course schedule and timeline as well as a comparison of the instructor’s average course evaluations before and after utilizing CBL (which were significantly improved).

**Esson, J.M., Stevens-Truss, R. , & Thomas, A. (2005). Service-learning in introductory chemistry: Supplementing chemistry curriculum in elementary schools. *Journal of Chemical Education, 82,* 8, 1168-1173.**

Esson & Stevens-Truss describe a CBL project with Introductory Chemistry students at Kalamazoo College and students at a local elementary school. The Kalamazoo students created chemistry projects related to kinetics, miscibility, gases, oxidation-reduction, and acids-bases that they implemented at the local elementary school. For example, one project investigated how plants are affected by the material in which they grow and the pH of the water. An assessment found that the elementary school benefitted more from the project than the college students as some undergraduates reported the projects to be too simplistic to enable deeper learning of classroom material. However, this perspective varied by gender with women having more positive views of the CBL project than men. Interestingly, the incorporation of CBL into the introductory chemistry class did correlate with a future increase in the number of chemistry majors at Kalamazoo.

**Gardella, Jr., J.A., Milillo, T.M., Sinha, G., Oh, G., Manns, D.C., Coffey, E. (2007). Linking community service, learning, and environmental analytical chemistry. *Analytical Chemistry, 79*, 3, 810-818.**

This article describes the development of CBL within an analytical chemistry of pollutants course at the University of Buffalo since 1982. Over the years, the course has utilized CBL by analyzing air pollutants and soil contamination in 6 different locations around Buffalo. The article describes a project done at one of these locations in-depth as well as outlining the week by week content and projects of the course.