S9.11 SHTYLLA, Blerta; Pomona College; *shtyllab@pomona.edu*
Interdisciplinary team approaches to mathematical modeling in a liberal arts setting.
Continuous and targeted engagement of student teams with practitioners and community partners can help create an exciting framework for interdisciplinary mathematical biology inquiry. In this talk I will discuss our experiences teaching modeling through a series of active learning course modules and capstone team projects in a one semester advanced undergraduate modeling course In a small liberal arts college. Challenges in arranging cohesive student teams as well as embedding outside guest lectures and hands on lab and field activities will be discussed.

8.5 SILVA−MARIA, I.; FINKLER, M.S.*; Federal Univ. of Amazonas, Manaus, Brazil, Indiana Univ. Kokomo, USA; *mfinkler@iuk.edu*
Patterns of resource consumption during embryonic development in the snapping turtle, Chelydra serpentina.
In order to assess differences in the efficiency by which snapping turtle embryos convert egg content into tissue at different intervals during development, we examined changes in the lipid, protein, and energy contents of snapping turtle eggs over the course of incubation at 29 °C. Total dry content (albumen and yolk) declined throughout incubation, with the rate of increase accelerating rapidly after Day 30 and corresponding with accelerated embryonic growth. Lipid and protein consumption demonstrated different patterns, with lipid content decreasing rapidly from Day 0 to Day 16, remained relatively constant between Day 16 to Day 40, then decreasing rapidly again after Day 40. In contrast, protein content remained relatively constant through Day 30 of incubation then rapidly declined after. The energy content of the eggs decreased parallel to the decrease in total dry content, with no significant change in energy density (kJ energy/g dry mass) over the course of incubation. The amount of dry embryo mass produced per unit egg content dry mass consumed decreased as development progressed, declining from 1.06 g/g between Days 16 and 30 to 0.64 g/g between Days 40 and 50. Our findings suggest a potential trade−off between accelerated growth rate and efficiency of resource usage during development.

49.1 SILVA−MARIA, I.*; OLIVEIRA, M.I.B.; COSTA, O.T.F.; DUNCAN, W.L.P.; Federal University of Amazonas, Manaus − AM, Brazil; *mariaisa21silva@gmail.com*
Organ asymmetry: An analysis of correspondence between quantity and functionality in the reproductive organs of female freshwater stingrays (Potamotrygonidae: Elasmobranchii)
Freshwater stingrays possess a unique combination of the ovaries (OV) and epigonal organs (EPO) into a single ovary−epigonal mass (OEM) that demonstrates both morphological and physiological lateral asymmetry. We examined OEM and uteri (UT) of six species of potamotrygonids in order to quantify the volume of OV and EPO within the OEM, to describe OV histology and UT morphology during different reproductive stages, and to verify a possible correspondence of lateral asymmetry between OEM and UT. OEM and UT of all species were examined both macroscopically and microscopically. Stereological techniques were used to quantify volume in an unnamed Potamotrygon species ("cururu stingray"). All of the species examined demonstrated lateral OEM asymmetry. The left OEM of Potamotrygon sp. was ~55 times larger and contained more macroscopically visual ovarian follicles (averaging 4 per left OV vs. usually absent in the right). The right OEM was composed of 7.3% OV tissue and 92.7% EPO tissue by volume, whereas the left side was 51.2% OV and 48.8% EPO. Seven phases of follicular development were identified in the OV with different compositions of follicular stages in each side. UT were symmetrical and the fecundity ratio between the right and left sides was 0.9:1.1 (right:left). Despite the volumetric difference in OV between the two sides, UT fecundity suggests that both OV are functionally symmetric and that ovarian fecundity alone is not an accurate measure of reproductive potential.

3.1 SILVESTRE, F*; DANIS, L; BAYAR, MA; DUBOIS, A; ADEYEMI, J; KLERKS, P; University of Namur, Osun State University, University of Louisiana, Lafayette; *frederic.silvestre@unamur.be*
Protein expression profiles in the least killifish, Heterandria formosa, exposed to copper during early life stage : can a stress proteome be inherited through generations ?
Nowadays, assessing the toxicity of chemicals in a single generation is no longer sufficient. One must take into consideration the possible inheritance of effects at the level of two or several generations. In the present study, we used the viviparous least killifish, *Heterandria formosa*, as a model species to test the hypothesis that an exposure to copper (Cu) in fish early life stage (ELS) can modify the protein expression profile in offspring. One week old least killifish were exposed to Cu at 15 ¼g/L for a period of one week, a condition inducing acclimation as previously reported using time−to−death endpoints. Fish were then held in clean water till breeding. After cytosolic protein extraction, their expression profile in 2 weeks old larvae was analyzed using 2D−DIGE followed by protein identification by nano−LC−ESI−MS/MS. A total of 50 protein spots have been differentially expressed in offspring whose parents have been exposed to Cu compared to offspring whose parents have never been exposed to this metal. After identification, these proteins have been categorized into diverse functional classes related to protein turnover, chaperoning, metabolic process, ion transport or oxidative stress. In conclusion, this study originally provides evidence that an exposure to a pollutant during ELS in a fish can affect the cellular phenotype in the offspring, assessed at the proteomic level. Ongoing researches will investigate the possible role played by epigenetics in this phenotypic inheritance and the adaptive and evolutionary consequences.