Proposal Opportunity

Agency Name **NASA**

Announcement # **NNH15ZDA001N-CMS**

Solicitation Name and Area **Carbon Monitoring System: Continuing Prototype Product Development, Research, and Scoping. Research Opportunities in Space and Earth Science – 2015 (ROSES – 2015)**

Working Title of Proposal **Development of a Prototype MRV System to Support Land Managers and Carbon Ecomarkets in Dakota grasslands**

Principal Investigator & Affiliation **Dr. Rebecca Phillips; Ecological Insights**

Description-what the proposal will accomplish

**The US carbon monitoring program sponsored by NASA has been extensively developed for forest ecosystems (Xiao et al. 2010). There are large gaps in carbon data where grassland ecosystems dominate, particularly in the northern Great Plains, but grassland ecosystem flux data have recently become available on a weekly time step using MODIS data (Gu and Wylie 2015; USGS-EROS paper in prep). This is a great achievement, but we still do not know how well net ecosystem production data garnered from flux data correspond to actual carbon stocks above and belowground. While grassland carbon stocks change dramatically with species and conditions, soil carbon stocks change more slowly. Do flux-based predictions of soil carbon reflect what is measured in the field? If not, how can we improve soil carbon predictions? We will address this problem by employing tools developed by collaborators to integrate flux and stock data and build a prototype grassland measurement, reporting a validation (MRV) system for grasslands. The prototype will evaluate grassland NEP with respect to aboveground carbon and belowground carbon by modelling plant, soil, topographic, and spectral data in a framework driven by grassland productivity site potential (Rigge et al. 2013). Results will demonstrate how AGC and BGC varies with site potential and how this model framework can be incorporated into analyses and maps of carbon flux. The goal is to help fill the NASA carbon monitoring system data gap and demonstrate how inclusion of carbon stock data will improve grassland MRV systems and support future carbon sequestration programs.**

**Gu, Y., Wylie, B.K., 2015. Developing a 30-m grassland productivity estimation map for central Nebraska using 250-m MODIS and 30-m Landsat-8 observations. Remote Sensing of Environment 171, 291-298.**

**Rigge, M., Wylie, B., Zhang, L., Boyte, S.P., 2013. Influence of management and precipitation on carbon fluxes in great plains grasslands. Ecological Indicators 34, 590-599.**

**Xiao, J., Zhuang, Q., Law, B.E., Chen, J., Baldocchi, D.D., Cook, D.R., Oren, R., Richardson, A.D., Wharton, S., Ma, S., Martin, T.A., Verma, S.B., Suyker, A.E., Scott, R.L., Monson, R.K., Litvak, M., Hollinger, D.Y., Sun, G., Davis, K.J., Bolstad, P.V., Burns, S.P., Curtis, P.S., Drake, B.G., Falk, M., Fischer, M.L., Foster, D.R., Gu, L., Hadley, J.L., Katul, G.G., Matamala, R., McNulty, S., Meyers, T.P., Munger, J.W., Noormets, A., Oechel, W.C., Paw U, K.T., Schmid, H.P., Starr, G., Torn, M.S., Wofsy, S.C., 2010. A continuous measure of gross primary production for the conterminous United States derived from MODIS and AmeriFlux data. Remote Sensing of Environment 114, 576-591.**