We will report on early stages of work ultimately intended to address these scientific questions:
(i) What are the predicted full-wave controls on lightning-to-whistler coupling?
(ii) How do these predicted full-wave controls compare with evidence from empirical topside data combined with lightning groundtruth?
(iii) When convolved with geographic, seasonal, and local-time variabilities of lightning occurrence rates, how will the full-wave coupling control (local-time, seasonal, geographic) variabilities of upward-coupled whistlers potentially impacting energetic particle inventories?
(iv) Will this seasonal/local-time/geographic supply of topside oblique whistlers differ markedly from the same pattern in the lightning occurrence rate?

Our numerical model of full-wave coupling to whistlers is based on our successful and data-validated D-region VLF propagation model [*Jacobson et al*., 2009; *Jacobson et al*., 2010; *Jacobson et al*., 2012], modified for systematic prediction of *upward-coupled* whistler waveforms recorded on topside satellites. The model has been run in production mode for predicting *downward-reflected* waveforms recorded at ground stations, but the model's internal calculation also fully describes the "penetrating" solution [*Pitteway*, 1965] that merges into the oblique electron whistler. We are beginning to conduct systematic, detailed, and mass-scale benchmarking of the model against VLF, three-dimensional electric-field recordings from the Vector Electric Field Instrument (VEFI) [*Pfaff et al*., 2010] on the C/NOFS satellite [*de La Beaujardiere*, 2004]. The C/NOFS' mission is to study topside F-region plasma irregularities, and C/NOFS funding support is for only the irregularity and radio-scintillation mission, not for lightning or whistler applications. However, VEFI's broadband recording and large on-board memory serendipitously provide a DEMETER-class (or better) platform for studying lightning whistlers in the plasmasphere. We have already demonstrated [*Jacobson et al*., 2011] that VEFI is superbly suited for providing mass-scale testing of transionospheric propagation. To support the use of topside waveform recordings, we are using the World Wide Lightning Location Network (WWLLN; see www.wwlln.net) to provide groundtruth location/time of the lightning strokes, as well as to provide waveform groundtruth via detailed time-domain waveforms (using a subset of special waveform-recording WWLLN stations).

de La Beaujardiere, O. (2004), C/NOFS: a mission to forecast scintillations, *J. Atmos. Solar-Terr. Phys.*, *66*, 1537-1591.
Jacobson, A. R. et al (2009), Full-wave reflection of lightning long-wave radio pulses from the ionospheric D-region: Numerical model, *J. Geophys. Res.- Space*, *114*, A03303, doi:03310.01029/02008JA013642.
Jacobson, A. R. et al (2010), Full-wave reflection of lightning long-wave radio pulses from the ionospheric D-region: Comparison with midday observations of broadband lightning signals, *J. Geophys. Res. -Space*, *115*, A00E27, doi:10.1029/2009JA014540.
Jacobson, A. R., et al (2011), Study of oblique whistlers in the low-latitude ionosphere, jointly with the C/NOFS satellite and the World-Wide Lightning Location Network, *Annales Geophysicae*, *29*, 851-863.
Jacobson, A. R. et al (2012), Time-domain waveform, and azimuth variation, of ionospherically reflected VLF/LF radio emissions from lightning, *Radio Sci.*, *47*, RS4001, doi:4010.1029/2012RS004980.
Pfaff, R. et al (2010), Observations of DC electric fields in the low-latitude ionosphere and their variations with local time, longitude, and plasma density during extreme solar minimum, *J. Geophys. Res.*, *115*, A12324, doi: 12310.11029/12010JA016023.
Pitteway, M. L. V. (1965), The numerical calculation of wave-fields, reflexion coefficients and polarizations for long radio waves in the lower ionosphere. I, *Phil. Trans. Roy. Soc. Lon.*, *257*(1079), 219-241.