Development of a Calibration for Estimating Flared Gas Volume for Gas Flaring from Nighttime Visible Infrared Imaging Radiometer Suite (VIIRS) Data

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Gas flaring is a widely used practice for disposing of natural gas during the petroleum production process. The National Aeronautics & Space Administration/NOAA VIIRS has a unique capability to detect and quantify the radiant emissions from gas flares worldwide on a nightly basis. Gas flares are about twice as hot as biomass burning, with a typical temperature of 1800 K. As per Wein's Displacement Law, the radiant emission peak near 1.6 um. This is the wavelength position of the VIIRS M10 spectral band. M10 is designed as a daytime imaging band. Most similar instruments forego the collection of daytime bands at nights. VIIRS collects M10 plus two additional near infrared spectral bands both day and night. With sunlight eliminated these spectral bands collect the peak radiant emission from gas flares. In this paper we present a calibration for estimating flared gas volumes from VIIRS data.

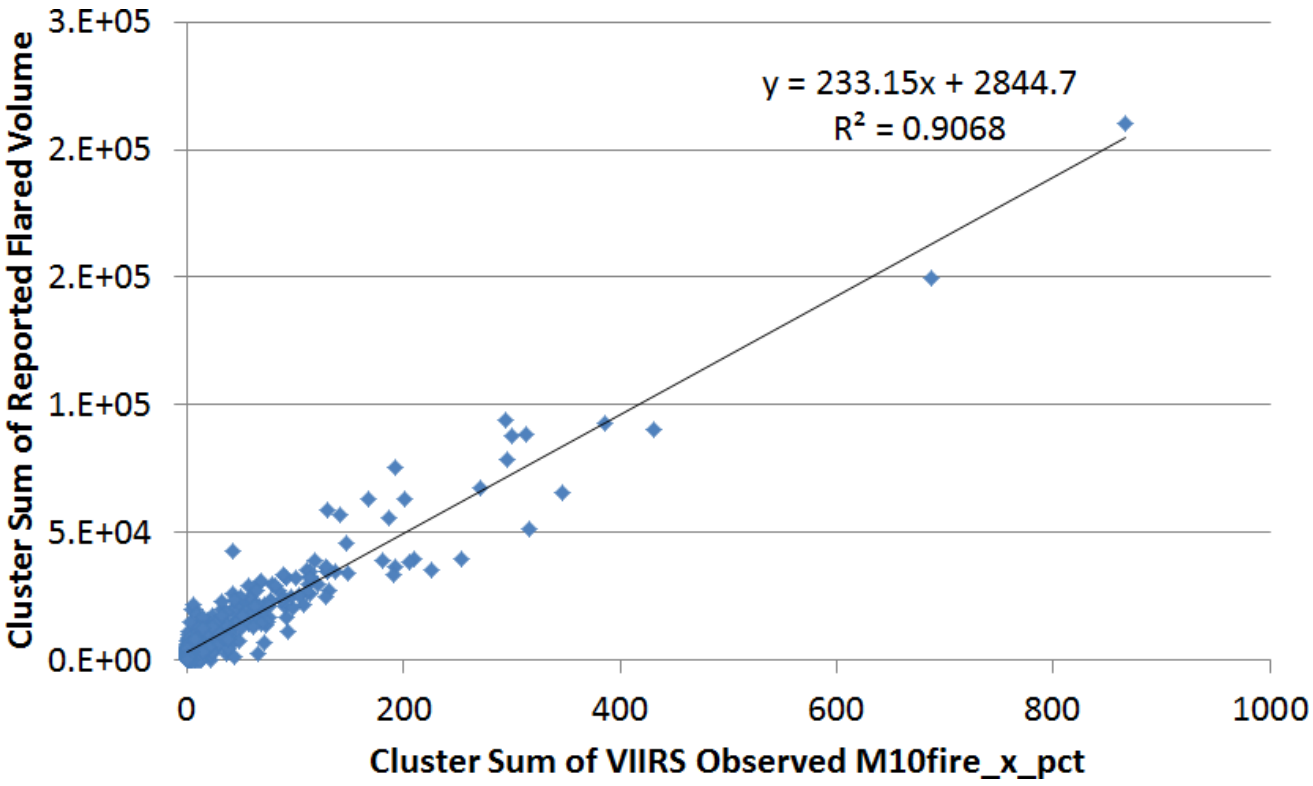

Figure 1. Calibration for estimating flared gas volumes based on monthly reported flare locations and flred gas volumes from the State of North Dakota.