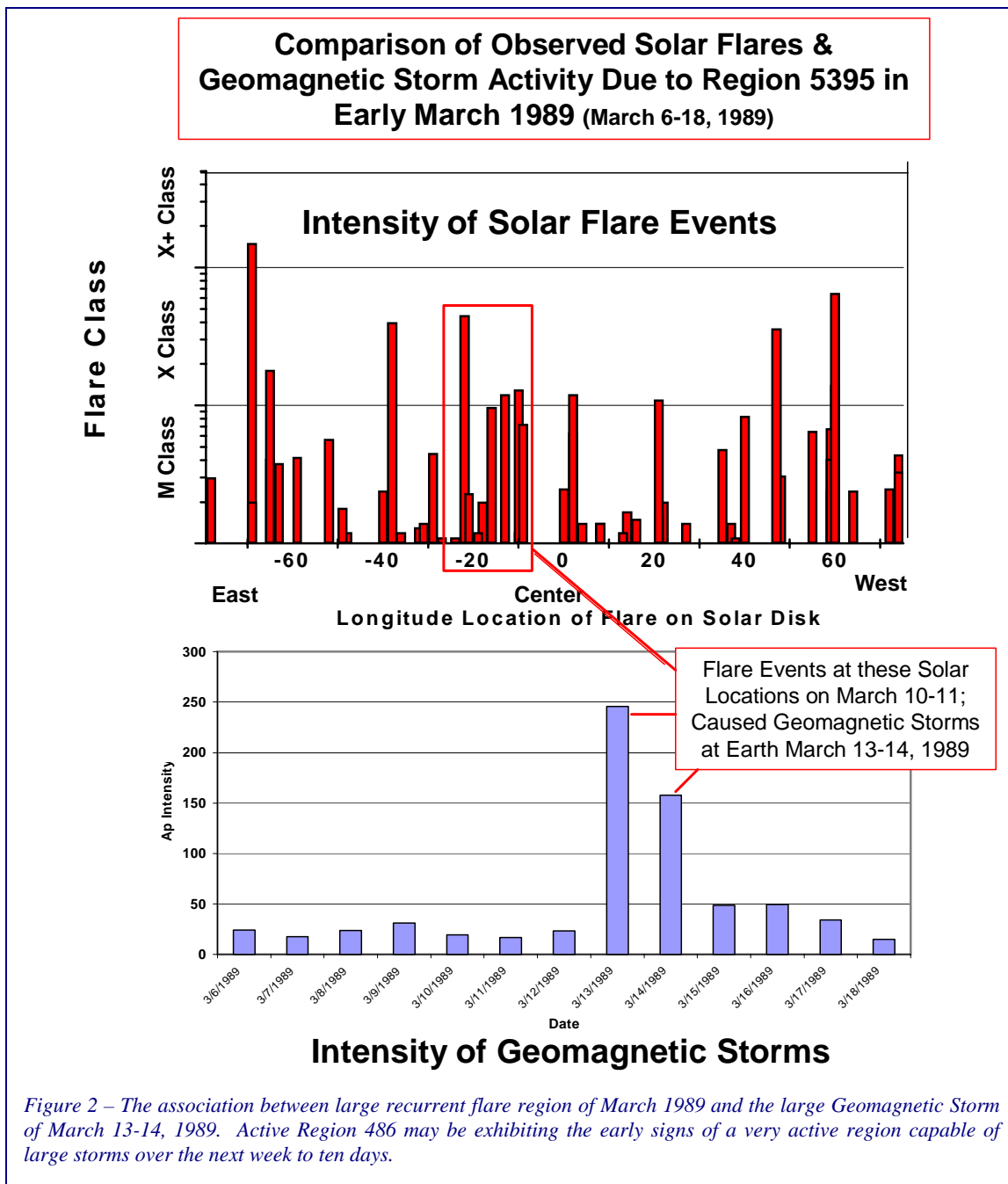


*Figure 1 – Large Active Region 484 as highlighted above, continues to be well-positioned, but relatively quiescent. The newly emerging Active Region 486 continues to produce frequent and large flare events but due to its eastern solar disk location, most of the energy is likely being expended harmlessly into interplanetary space and is not fully directed at Earth. Region 486 will pose a much larger hazard for geomagnetic storms if it continues at this pace over the next 5-10 days and becomes more favorably directed towards Earth.*

### **Solar Condition and Geomagnetic Storm Update Advisory**

As we reported on October 23, two large Active Regions are now present. The most important of these regions is the newly emerging Region 486, which has continued to produce large flare events over the past 48 hours. Since our report of yesterday, two more large flares from this region have been observed. However, we do not expect these events to have major geomagnetic storm impacts at the Earth, due to the relatively poor positioning of the region on the Sun. Region 484 is more favorably positioned, but does not appear to be producing activity at this time. However, any large flares from this region could be well-directed to produce large storm events at the Earth. At this time a CME passage is causing a moderate intensity geomagnetic storm, the considerable media attention to this storm is, at this time, an over-reaction on their part. This CME would appear to be a “glancing blow” category due to less than favorable suspected orientation relative to the Earth.

The threat conditions posed by Active Region 486 will not be as significant until it becomes more favorably aligned with the Earth (approximately 4 to 5 days from now). Then recurrent large flare activity would have highly favorable orientation to be directed to the Earth. If this flare activity persists at the present pace (a considerable uncertainty at this time), then the likelihood of large storms would also be enhanced. Figure 2 shows the association between a large active region (Region 5395) that spawned the Great Geomagnetic Storm of March 13-14, 1989. This figure shows in the top plot, the observed large M and X Class flares from the region as it transited from East to West across the solar disk (from March 6 through March 18, 1989). The bottom figure shows a plot of the resulting geomagnetic storm activity observed at Earth over this same interval of time. In this case, Active Region 486 has only just emerged and produced 5 large flares. However, the region is still located on the eastern edge of the Sun, in fact today's position has it at ~70 degrees east. Also noted on the figure are the flares which are suspected as being the source of the March 13-14, 1989 geomagnetic storm, these occurred at East longitudes of 20 degrees or less. There are always exceptions to this rule, but our estimate is that the high probability events from Region 486 are yet to materialize.



Flare and CME observations from active regions can give a several day precursor of possible geomagnetic storms at the Earth. Flare energies provide a quantification of the amount of energy that is erupted into Interplanetary Space from the Sun. If large flare and CME activity continues to occur over the next few days, then probabilities for a large geomagnetic storm will increase. Metatech will continue to provide updates to these Solar Condition Advisories as warranted.

John G. Kappenman, Metatech  
[john@metatechcorp.com](mailto:john@metatechcorp.com), 218-727-2666 [www.metatechcorp.com](http://www.metatechcorp.com)