

Pastures from Space & Precision Sheep Production

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The problem with Landsat 7

In the first newsletter I described the satellites we use in our FOO calculations, with Landsat 7 being our first choice primarily due to costs. I spoke too soon!!!

On 31 May 2003 Landsat 7 ETM+ experienced an anomaly that degraded the imagery being collected by the Enhanced Thematic Mapper plus (ETM+) instrument. The ETM+ sensor was turned off by USGS (United States Geological Survey) on 6 June 2003 due to an anomaly with the onboard Scan Line Corrector. **This anomaly made the received data unusable.**

The USGS Flight Operations Team and Ground System engineers are currently working with NASA engineers and the instrument manufacturer to diagnose and correct the problem. Standard Landsat 7 operations have been suspended until further notice.

The Landsat 7 website provides regular updates <http://landsat7.usgs.gov/updates.php>

The technical description of the problem
"The US team assessing the anomaly with the Scan Line Corrector (SLC) on Landsat 7 has identified more than 150 possible fault scenarios, both electrical and mechanical. The team is working through the process of identifying the most likely scenarios based on the telemetry and data signatures seen following the anomaly. The team is also looking at possible recovery scenarios. While we would all like a "quick fix", they are quite properly taking

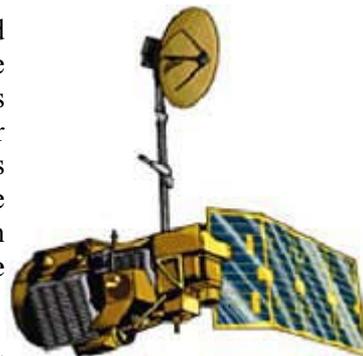
the necessary precautions to avoid any further problems with the SLC."

"A team of engineers and science users in the US are also investigating the science validity and useability of the non-functioning SLC data. Engineers are working on changes to the data production algorithms that allow processing of post-anomaly data.

The reality

Unidentified Government and industry officials were quoted in *Space News* on 23 June as saying that the glitch, even if it can be fixed, will keep the spacecraft out of action for at least 4 to 12 weeks.

Landsat 5 – dust off the cobwebs



Fortunately I also mentioned that Landsat 5 was being brought back into service at the time with the idea of filling in the gaps between landsat 7 passes. When this was planned no one could foresee that Landsat 7 would develop a glitch.

The Landsat 5 satellite, launched on 1 March 1984, is still operational and providing high quality data.

As part of it being brought back into service some upgrading was required mainly of its software both up there and down here.

The Australian Centre for Remote Sensing (ACRES) upgraded its processing software to implementing a significant improvement to the calibration of Landsat 5 data. As a result of this upgrade, ACRES Landsat 5 products will be consistent over time and also consistent with Landsat 7 products.

ACRES have requested USGS to routinely schedule all Landsat 5 passes over Australia from 1 July 2003 for down linking at Alice Springs

Over the last few weeks ACRES have acquired several Landsat 5 passes to test modifications to

the cataloguing and product generation software. As part of this exercise we were able to push for some of this testing to be done on our images, thus making sure we were in the act as early as possible.

For further information, visit

<Http://www.ga.gov.au/acres/whatnew1.htm#ls5>

Below the horizon

– It's coming and we can almost see it

The glitch with Landsat 7 was a reality check for the team and highlighted our dependence on external technology. We are on a continuous lookout for other satellites we can incorporate into the portfolio.

On the 4th July, DOLA and CSIRO attended a presentation of the Quickbird Satellite. With a resolution between 1 and 4 meters depending on the bands we look at this is the next generation satellite, which would provide a significant improvement in accuracy. Quickbird followed the launch of the Ikonos satellite and in turn was followed on the 26 June 03 with the successful launch of the OrbView-3 satellites. All 3 satellites have similar resolution and a revisit time of about 3 days.

There are a lot of behind the scenes negotiations going on at present to see how we can stretch our budgets to access some of these images.

Feedback - why it's useful

Over the last couple of months, through this newsletter and at meetings with producers the Pastures from Space team have pushed the message that while we believe in the data we send you and try to make sure it complies with the QC program we implemented this year we still depend on your feedback to highlight areas where there could be problems with the accuracy of our estimates.

Well that is exactly what Brad Wooldridge did with Rodger Bryant. Note: In 2002 Brad was one of our co-operators who was very active in pushing the limits using this technology.

Email from Roger Bryant:

“Hi all, just forwarding a message from Brad Wooldridge. He has some real concerns with PGR estimates (actuals) for the last month for

his farm, and I have a tendency to agree. Way higher than we would have estimated, especially when you look at the type of month we have just had weather wise. One of the reasons for agisting animals, was a PGR estimate of probably 6 kg/ha/d or less (some paddocks have appeared to have gone backwards since May) at the time he had to make the hard decisions”.

Comments from Steve Gherardi:

I ran this past Stewart Gittins our ace pasture technician who had visited Brad's during the first week of July. He thought that growth rates overall of 6 kg/ha/d during June were too conservative. He thought values around 15 kg/ha/d were more realistic. How did he come to this conclusion? Well he did a FOO estimate in a paddock that Brad had locked up for 14 days and estimated it to be around 750 kg/ha. Based on the fact that Brad normally grazes down to 400-500 kg/ha FOO, he estimated that the PGR in this paddock would need to have been around 17 kg/ha/d. The satellite estimated average PGR for Brad's farm for June was around 15 kg/ha/d.

We acknowledge there are limitations to the technology and the fact that we are unable to discriminate between adjoining paddocks when using a 1 km pixel. To quote Graham Donald, the PGR guru:

“The current AVHRR satellite data is at 1 km resolution and would include trees remnant veg. etc. but we can do nothing about this until MODIS model is operational. The 2003 MODIS information has just landed on my desk and will take a little while for me to unpack. We also have to address the extrapolation of minimum temperature down to the farm level. We are able to extrapolate rainfall, evaporation and maximum temperature quite well down to the farm level but not minimum temperature”.

Comments from Gonz:

While there are no quick fixes to Brad's problem it has increased everybody's awareness and highlighted some issues to look at when MODIS data is available. At 250m pixels we will be better able to separate different paddocks.

In the next newsletter I hope to have some comments from Mike Hyder (DAWA, Albany) on the effect heavy stocking has on pasture growth rates and the calculations of PGR, which is a factor that so far has not been taken into consideration in this exchange of comments and

may partly explain some of the discrepancies in the observations.

At the same time the fact that the data is being questioned is a great sign of progress and understanding of the use of the data.

So if you have a question or two about some of your paddocks, speak up...

Pasture Watch

It's out there and the comments back are very positive. If you are still having problems installing or downloading information, contact your local group coordinator for assistance.

Just a few things to remember:

New PGR data gets posted every Thursday afternoon, so you should all be able to download the latest paddock info on Friday morning without any problem.

Downloading the data is a bandwidth-hungry process, so to make sure it goes as fast and smoothly as possible, make sure you do not download emails or surf the web while you wait for Pasture Watch to finish downloading.

Feed Budget Calculators

The Feed Budget Calculator program is now available on CD. All those interested in purchasing a copy (\$15) contact Rodger Bryant on phone - 98810222

Email - rbryant@agric.wa.gov.au

As the name suggests the program will allow you to do all the usual feed budgeting calculations by providing set scenarios such as deferment or supplementation in autumn, or grazing to a set production level or set FOO in winter and spring to manage both the animal as well as the pasture composition. A great complement to Pasture Watch.

I am sure Rodger would be happy to organize a demonstration during one of the upcoming meetings if there is enough interest.

An alternative is a much simpler and basic calculator in the livestock section of the Farmshed website associated with their shire PGR maps (<http://www.thefarmshed.com.au>), but of course you have to be on line to use it.

Quantifying Pastures from Space

Lucy Anderton; Regional Economist attached to the Katanning District office of the Dept. of Agriculture has joined the peripheries of the Pastures from Space team. Lucy's role will be to catch up with co-operators and document on farm management decisions that have been made with the aid of the Pasture from Space technology. As part of the AWI project she will be quantifying the benefit of the technology to producers.

Steve commented that this type of documentation was vital for further investment in the project and urged all co-operators to contribute where possible.

Lucy can be contacted at the Katanning office on 98213333.

Meeting Dates

Next meeting dates:

Darkan- 9am-11.30am- Monday 21st July (note earlier start time as Roclea needs to be away by 11:30am)

Kojonup 1- 2pm-5pm-Monday 21st July

Kojonup 2 (PIRD)- 9:30am Tuesday 22nd July.

For Brookton, Moora and Dandaragan, please check with your local coordinator

Lifetime Wool Production

I have received a PDF file produced by Chris Oldham of an article published in the Farming Ahead Magazine. As merging different PDF files is not our forte, this will be sent out as an attachment to an email.

The title of the Article is: Better feeding during pregnancy lifts ewe profits

Requests?

Rodger suggested that you as the readers of the newsletter might want to have your say or request specific information. If so, drop me (Gonz) a line at

<mailto:Gonzalo.Mata@csiro.au> and it will be included in the next edition.