



Directing Outputs to Enable Concurrent Job Processing

One of the main benefits of the TNTmips Job Processing System (JPS) is that it allows you to easily run multiple concurrent processes to maximize the use of your computer's multiple processor cores. The JPS Job Manager allows you to specify the maximum allowed number of concurrent jobs and to manage and monitor the progress of these jobs (see the Technical Guides entitled *System: Managing Job Processing* and *System: Managing the Job Queue*).

Multiple jobs can be run concurrently using the JPS, limited by the value you set for the Maximum Running Jobs parameter. However, only one TNTmips process (and thus only one job) can write to a specific output file at a time. If you start a series

of jobs that direct their outputs to the same file, the JPS will automatically run them one by one, rather than concurrently, regardless of your Maximum Running Jobs parameter setting. Jobs that are currently blocked from running due to contention for the same file remain in the job queue with their status set to Blocked. These blocked jobs are run in the order shown in the Job Manager's Status column, which you can control by changing their priorities as discussed in the TechGuide entitled *Managing* the Job Queue. If blocked jobs are followed in the Oueue by

nding	Done	Failed	Scheduled	Settings							
Select	A11	Tasks i	not running	Queue	Hold Del	ete Run Now	Schedule Jo	ob 🛃 🛃 🎽	Tasks	running Pause	Resume Cance
Sta	tus 🔺	Priority	ID		Nane			Process ID	Run Time	Progress	
Runn	ing	10	20140224_	100657_01	Raster Ex	tract		(6/6)	21		
Run	ning	10	20140224_	100657_02	p045r027_	20000716.rvc /	Band1	1004	21		
Blo	cked	10	20140224_	100657_03	p045r027_	20000716.rvc /	Band2				
Blo	cked	10	20140224_	100657_04	p045r027_	20000716.rvc /	Band3				
Blo	cked	10	20140224_	100657_05	p045r027_	20000716.rvc /	Band4				
Blo	cked	10	20140224_	100657_06	p045r027_	20000716.rvc /	Band5				
<mark>B10</mark>	cked	> 10	20140224_	100657_07	p045r027_	20000716.rvc /	Band7				
	Outpu Rasi	ut terExtract			or 20140224	4_100657_02_jot	<u>.</u>				

All of the jobs shown above in the Job Manager's Pending tabbed panel specify the same Project File for their output. The currently running job has placed a write lock on this output Project File; each of the remaining jobs needing to write to this file is blocked from running until all of the preceding jobs have completed. Queued jobs blocked by a file lock are indicated in the status field as *Blocked*. Hovering the mouse over the status field also reveals a DataTip that explains the lock status.

other jobs that do not require a file that is currently being written to by another job, the JPS will automatically skip the blocked jobs temporarily and run the next nonblocked jobs and thus proceed with concurrent processing up to the Maximum Running Jobs value.

You can avoid the JPS file contention issues outlined above by setting up jobs so that each one writes its output to a separate file. Tools and strategies for directing outputs to different files are discussed below for different types of TNTmips processes.

Processes Making a Single Output Object (Single Job File)

Some TNTmips processes that support Job Processing produce a single output object from one input object (or a set of input objects). An example is Vector to Raster Conversion (Geometric / Convert / Vector to Raster), which has a number of data-specific process settings and thus allows you to select only one input object at a time. Pressing the Queue Job or Save Job button in this process creates a single job file that launches one job process utilizing that input/output pair of objects. Setting up a series of such jobs requires reselecting the input and output objects individually for each job. In order to ensure that you can achieve concurrent processing of a series of such jobs, you only need to take care to direct the output object for each job to a different Project File using the familiar file and object naming procedures that you use with any TNTmips process.

Input Parameters	1				
Input Vector cb_soils_rbs.rvc / CBSOILS	Vector to Raster Conversior				
Points Lines Polygons	is an example of a process				
Process: All -	that creates one output				
Value: All Same - 🖉	object. Each job file is				
Dutput Parameters	created separately in the process by selecting the				
Output Type 8-bit unsigned					
Cell Size Raster Size	appropriate input and output				
Height: 27.178 Lines: 512	objects and pressing the				
Hidth: 27.126 Columns 380					
Units: meters -	Queue Job or Save Job				
🔟 Use reference raster	button.				
Input Raster					
Run Queue Job Save Job	Exit Help				

Processes Making Multiple Output Objects (Multiple Job Files)

A number of TNTmips processes that support Job Processing can produce multiple output objects from one or more input objects. For example, Raster Extract (Image / Extract), Raster Resampling (Image / Resample and Reproject / Automatic), and Geometric Warping (Geometric / Reproject) allow you to select a number of input objects and create one output object for

(over)

🖏 Raster Extract	
Rasters Extract Map Extents Zoom/	'Orient Values Insert Special
L7_p202r039.rvc / Band1 L7_p202r039.rvc / Band2	📕 🧏 Geometric Warping via Georeference 📃 🗆 🔀
L7_p202r039.rvc / Band3	Alabana,rvc / Alabana
L7_p202r039.rvc / Band4	Arkansas, rvc / Arkansas
L7_p202r039.rvc / Band5 L7_p202r039.rvc / Band7	Connecticut.rvc / Connecticut
Select Renove Renove All	Select Renove Renove All
	Model From Georeference 💌
Run Queue Job Save	Job. 🗐 Match source coordinate reference system
L	Output Projection WGS84 / Geographic
Raster Extract and	Densify lines Accuracy 10.00 meters
Geometric Warping	Run Queue Job Save Job Exit Help
(above) are processes	

🍢 Topographic Properties									
Raster HighSierra.rvc / HighSierra									
Surface-fitting method for 3*3 Window									
Exact fit to 4 nearest neighbors and center	cell 💌								
Output raster information									
▼ Slope 8-bit unsigned integer ▼ Degrees ▼									
🕱 Aspect 16-bit signed integer 💌									
🕱 Shading 🛛 8-bit unsigned integer 💌 Met	hod High-Contrast 💌								
▼ Curvature 32-bit floating-point ▼ ▼ Profile ▼ Plan Radians/Meter ▼									
Pyramid Average 💌 Compression Standard Los	ssless 💌								
- Paraneters	Sun Angle Calculator								
Horizontal Cell Size 10.0 m	Latitude N 0 00 00.000 🚱								
Vertical Cell Size 10.0 m	Longitude E 0 00 00.000								
Scale for elevation 1.0000	Day 1 Month 1 Year 1901								
Elevation angle of the sun 60.0 de	8 Hour 0 Minute 0 UTC								
Direction of the sun 300.0 de	2g Calculate								
Run Queue Job Save	Job Exit Help								

that allow selection of multiple input objects and produce one output object for each. The Topographic Properties process (right) is an example of a process that can create more than one output object from a single input object (a digital elevation model raster object). The Queue Job and Save Job buttons in these

processes automatically create a separate job file for each output object. These jobs can then run concurrently if each of these output objects is directed to a different Project File.

each input object. The Topographic Properties process (Terrain / Topographic Properties) lets you create various output products from a single input elevation raster. Pressing the Queue Job or Save Job button in any of these processes automatically creates a *separate* job file for each output object. These jobs can run concurrently if each of these output objects is directed to a different output Project File.

You can automatically create a separate Project File for each output object in such processes by using the Auto-Name button on the Select Objects dialog. You may have used this button to automatically name all of the new objects *after* you selected an output project file. However, this button is also available *before* you have selected and navigated into a particular Project

🛰 Select raster objects to extract to		_ 🗆 🔀	🖎 Select raster objects to extract to	
E (Data) - temp - JobProcessing -		• MA@ !!!	E (Data) - temp - JobProcessing -	• 🕅 🎗 🕅 •
Name (10 files) 🔺	Modified Size Type		Name (10 files) .	Modified Size Type
FrenchmanSAS, rvc	2014-02-20 8,19 KB TNT Project		FrenchmanSAS, rvc	2014-02-20 8,19 KB TNT Project
GassPeakSAS.rvc	2014-02-20 8,19 KB TNT Project		🖬 GassPeakSAS.rvc	2014-02-20 8,19 KB TNT Project
HendersonSAS, rvc	2014-02-20 8,19 KB TNT Project		HendersonSAS.rvc	2014-02-20 8,19 KB TNT Project
HighSierraNAD83.rvc	2014-02-20 8,19 KB TNT Project		HighSierraNAD83,rvc	2014-02-20 8,19 KB TNT Project
ME_BedrockGeologyGeo.rvc	2014-02-20 8,19 KB TNT Project		ME_BedrockGeologyGeo.rvc	2014-02-20 8,19 KB TNT Project
RasterExtract.rvc	2014-02-24 109 MB TNT Project		RasterExtract.rvc	2014-02-24 109 MB TNT Project
Slope,rvc	2014-02-21 8,19 KB TNT Project		Slope,rvc	2014-02-21 8,19 KB TNT Project
ValleySAS.rvc	2014-02-20 8,19 KB TNT Project		ValleySAS.rvc	2014-02-20 8,19 KB TNT Project
N		$\overline{N[S]}$	A	
Files 💭 All 🗇 rvc Objects All 📃	🗏 Question	_ = 🛛	Files] All C rvc Objects All	
Selected	Each object will be created in a separa	te project file.	Selected	
Object Name Description	Files will be created immediately, with		Object Name Description	Location
Band1 [skip - click to assign]	-	OK Cancel	Band1 Band1 p202r039_7t20010410_z29_nn10	E:\temp\JobProcessing\Band1.rvc
Band2 [skip - click to assign]		UK CURCE	Band2 Band2 p202r039_7t20010410_z29_nn20	E:\temp\JobProcessing\Band2.rvc
Band3 [skip - click to assign]			Band3 Band3 p202r039_7t20010410_z29_nn30	E:\temp\JobProcessing\Band3.rvc
Band4 [skip - click to assign]			Band4 Band4 p202r039_7t20010410_z29_nn40	E:\temp\JobProcessing\Band4.rvc
Band5 [skip - click to assign]			Band5 Band5 p202r039_7t20010410_z29_nn50	E:\temp\JobProcessing\Band5.rvc
N				
New Folder	Space free: 748 GB T	emporary: 231 GB	New Folder	Space free: 748 GB Temporary: 231 GB
New File Name			New File Name	
Description			Description	
	Auto-Name Create File	OK Cancel		Ruto-Name Create File OK Cancel

Select Objects dialog for designating the output rasters for the Raster Extract process window shown at the top left of this page, opened using the Queue Job or Save Job button. Pressing the Auto-Name button while at the file level of navigation (above left) immediately creates a separate new Project File for each output object. The name of each input object is used to name its output Project File and object (result above right).

File. Used at the file level of navigation, it creates a separate new Project File for each output object. The input object name is used to name the corresponding output Project File and output object. (If any of these file names is already in use within the selected directory, you are prompted to choose a different output directory).

elect All	Tasks r	not running Queue	Hold Delete Run	Now Schedule Job	🛃 🗣 皆	🛃 🛛 Tasks ru	nning Pause	Resume Cancel
Status 🔺	Priority	ID	Nane		Process ID	Run Time	Progress	
Running	10	20140224_114951_01	Raster Extract		6/6)	17		
Running	10	20140224_114951_02	L7_p202r039.rvc /	Band1 2	472	17		
Running	10	20140224_114951_03	L7_p202r039.rvc /	Band2 1	152	17		
Running	10	20140224_114951_04	L7_p202r039.rvc /	Band3 3	356	17		
Running	10	20140224_114951_05	L7_p202r039.rvc /	Band4 3	484	17		
Queue	10	20140224_114951_06	L7_p202r039.rvc /	Band5				
Queue	10	20140224_114951_07	L7_p202r039.rvc /	Band7				
			jobs created	showing four above running writing to diffe	g concu	rrently wit	h	
 lected: 1	Runn	ing: 0 Holding	: 0 Queued: 0					IX