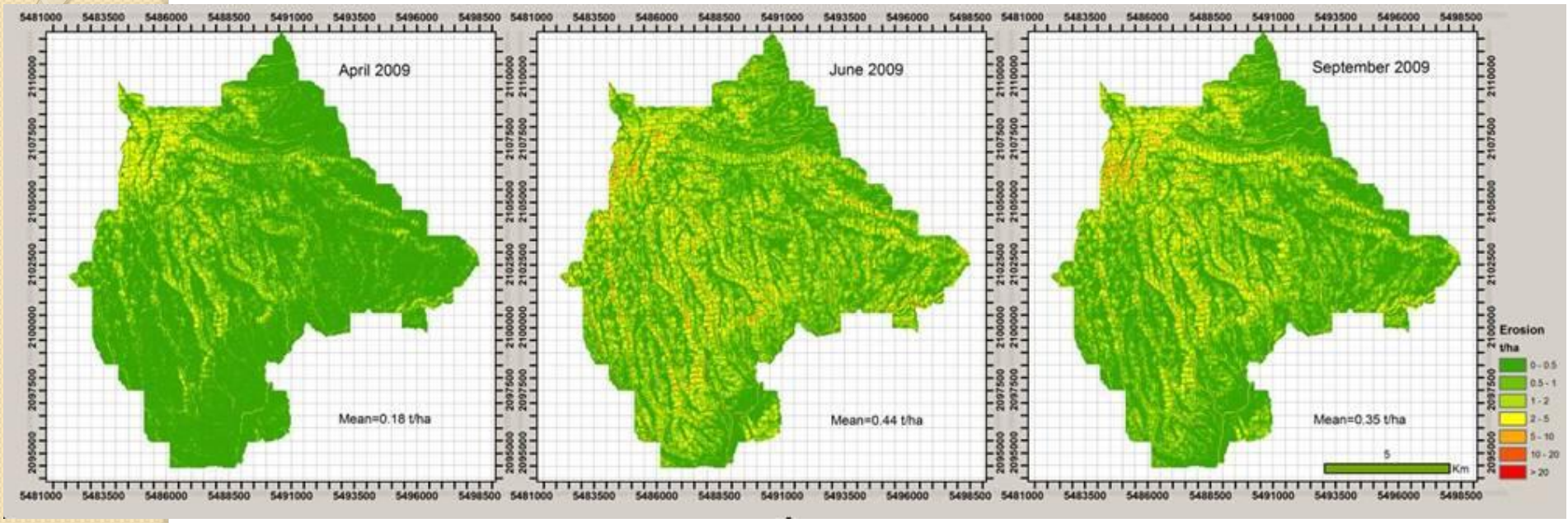
G2 erosion model
Quality assurance

1-day training event
School of Forestry and Natural Environment
Thessaloniki, 29 May 2012

geoland2

Local scale

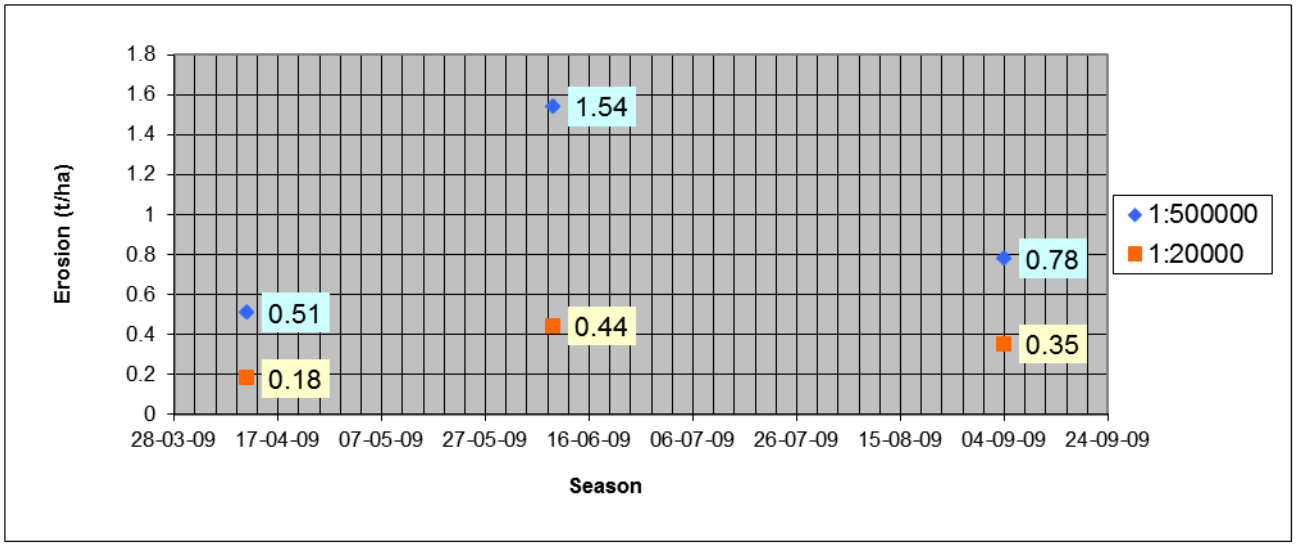


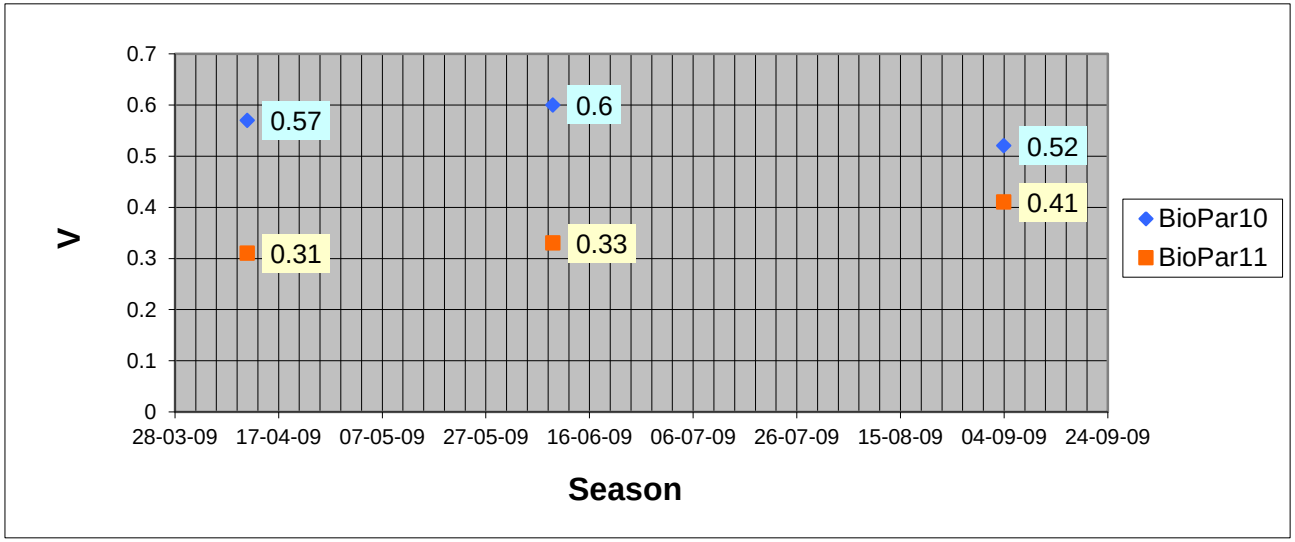
- Slope
  - ASTER DEM (30 m)
- Rainfall erosivity
  - Hellenic National Meteo-service
- Soil erodibility
  - National physiographic map (Nakos)
- Vegetation status
  - (Euroland/Biopar products / 10 m)
- Human management
  - SPOT Image 2006 / 25 m

Scale comparison (1)

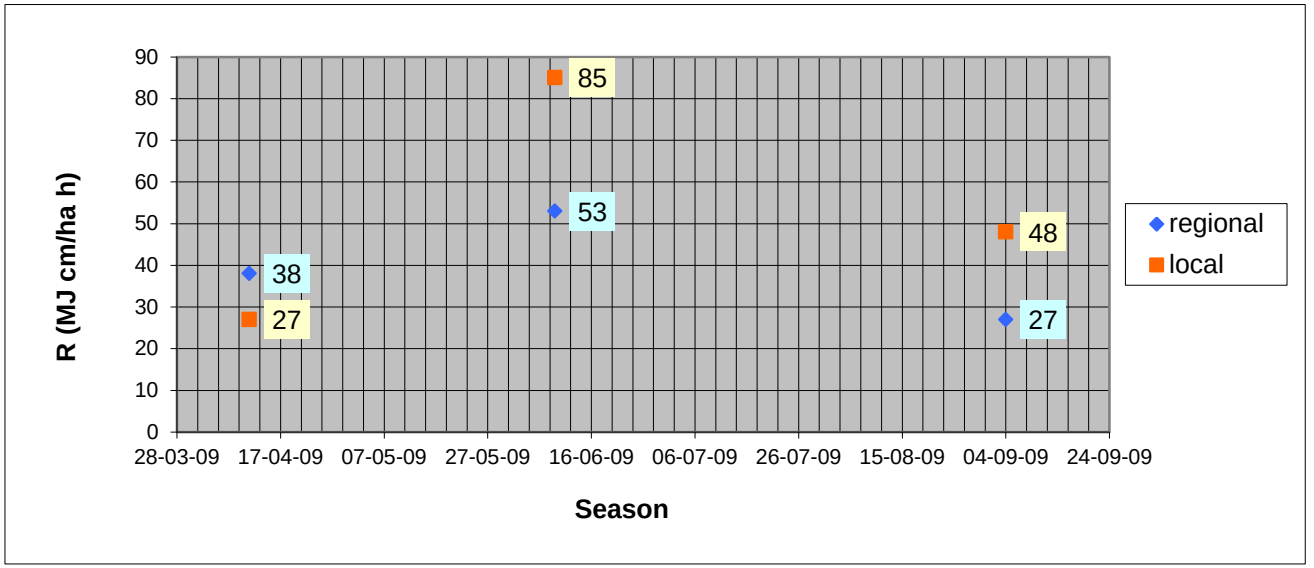
		MEAN EROSION VALUES	
		SCALE	
BIOPAR-11 dates		1:500000	1:20000
	11-04-09	0.51	0.18
	09-06-09	1.54	0.44
	04-09-09	0.78	0.35
		INPUT LAYERS	
Topography	T	ASTER-DEM	ASTER-DEM
Soil	S	ESDB	Local Physiographic maps (Nakos)
Interception	I	SPOT	SPOT
Rain	R	Gr-Bg meteo	Gr-Meteo
Vegetation	V	BIOPAR-10	BIOPAR-11
		Layers were upscaled to 300 m cell size	Layers were downscaled to 10 m cell size
year of application		2003-2005-2006 (avg)	2009
		Used on scale 1:500000	
		Used on scale 1:20000	
		Used on both scales	

Scale comparison (2)





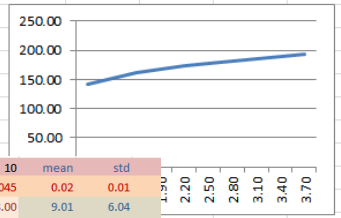
Scale comparison (3)

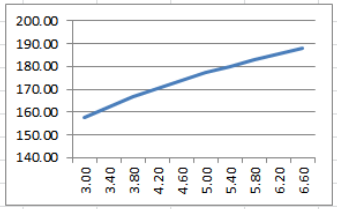


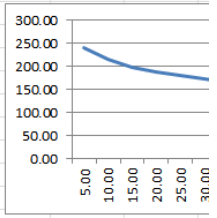
S factor	
regional	local
0.0254	0.0198

Sensitivity tests

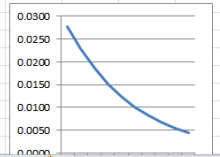
SENSITIVITY TESTS	1	2	3	4	5	6	7	8	9	10	mean	std
R	142.53	152.67	160.70	167.34	173.01	177.95	182.33	186.26	189.83	193.10	167.85	15.12
s	1.00	1.30	1.60	1.90	2.20	2.50	2.80	3.10	3.40	3.70	2.35	0.91
P	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80		
dxh	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50		
O/I	142.53	117.44	100.44	88.07	78.64	71.18	65.12	60.08	55.83	52.19	83.15	29.35
R	157.39	162.23	166.53	170.39	173.91	177.13	180.11	182.87	185.45	187.86	171.32	8.88
s	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35		
P	3.00	3.40	3.80	4.20	4.60	5.00	5.40	5.80	6.20	6.60	4.80	1.21
dxh	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50	27.50		
O/I	52.46	47.71	43.82	40.57	37.81	35.43	33.35	31.53	29.91	28.46	38.11	7.96
R	241.45	214.66	198.98	187.86	179.24	172.19	166.23	161.07	156.52	152.45	190.21	27.19
s	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35		
P	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80		
dxh	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	27.50	15.14
O/I	48.29	21.47	13.27	9.39	7.17	5.74	4.75	4.03	3.48	3.05	12.06	13.93

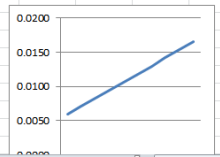


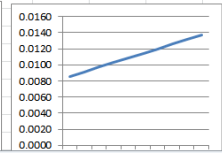


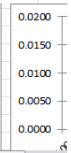


SENSITIVITY TESTS	1	2	3	4	5	6	7	8	9	10	mean	std
S_c	0.0276	0.0228	0.0186	0.0152	0.0124	0.0101	0.0083	0.0068	0.0055	0.0045	0.02	0.01
OM	0.10	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	9.01	6.04
Smoothing	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.00
CI	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.00
S_{pre}	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.03	0.00
O/I	0.2765	0.0114	0.0047	0.0025	0.0016	0.0010	0.0007	0.0005	0.0003	0.0003	0.03	0.09
S_c	0.0059	0.0071	0.0083	0.0094	0.0106	0.0118	0.0130	0.0142	0.0153	0.0165	0.01	0.00
OM	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	0.00
Smoothing	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	0.95	0.30
CI	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.00
S_{pre}	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.03	0.00
O/I	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
S_c	0.0086	0.0092	0.0097	0.0103	0.0109	0.0114	0.0120	0.0126	0.0132	0.0137	0.01	0.00
OM	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	0.00
Smoothing	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.00
CI	0.75	0.80	0.85	0.90	0.95	1.00	1.05	1.10	1.15	1.20	0.98	0.15
S_{pre}	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.03	0.00
O/I	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
S_c	0.0037	0.0052	0.0067	0.0082	0.0097	0.0112	0.0127	0.0142	0.0157	0.0172	0.01	0.00
OM	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	0.00
Smoothing	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.00
CI	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.00
S_{pre}	0.0100	0.0140	0.0180	0.0220	0.0260	0.0300	0.0340	0.0380	0.0420	0.0460	0.03	0.01
O/I	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.00



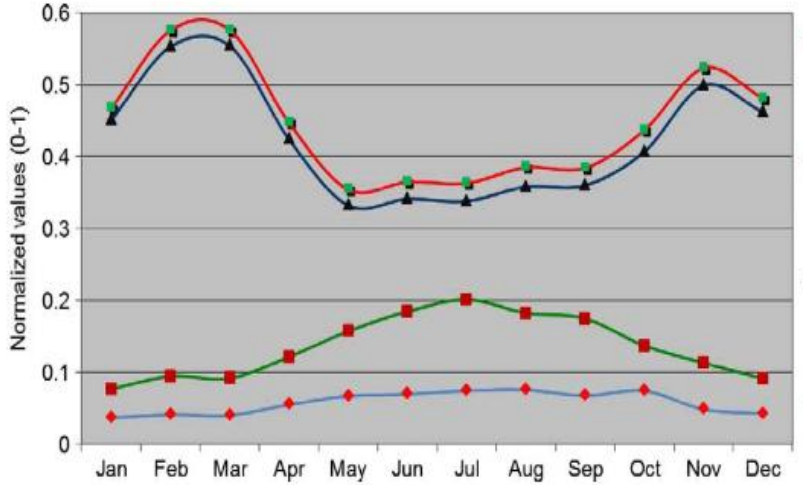


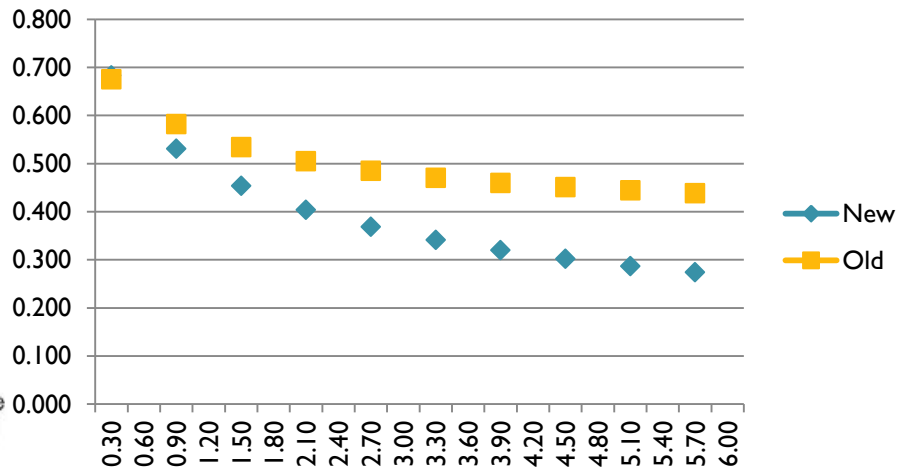




Modifications in the new version

- E=(R/V)*S*(T/I)
- V=2*SQRT(LAI)-LN(FSoil)
- T:same, new condition:T<=4
- I=EXP(2.5*S_f/255)





Modifications

PARAMETERS			
Symbol	Name	Units	
E	Erosion	t/ha	
R	Rainfall erosivity	MJ cm/ha h	
V	Vegetation retention	dimensionless; normalised; range=[0,1]	
S	Soil erodibility	t ha h / MJ ha cm	
T	Topographic influence	dimensionless; range=[0,10]	
I	Interception of slope length	dimensionless; range=[0,1]	
E	2.059	t/ha	
R	128.05	MJ cm/ha h	temporal parameters
s	1.50	>=1	
P	400.00	mm	
rain frequency	100.00	days	
rain duration	5.00	hours	
V	3.1		temporal parameters
FSoil	0.50	(0,1]	
LAI	1.50	m^2/m^2; (0,6]	
S	0.0277	t m^2 h^2 / ha J cm	Texture
OM	2.00	%	1. Coarse (clay<18% an
Smoothing	1.00	[0.5-1.5]	2. Medium (18%<clay<
CI	1.00	[0.75,1.25]	3. Medium fine (clay<3
S_{pre}	0.0339	t m^2 h^2 / ha J cm	4. Fine (30%<clay<60%)
			5. Very fine (clay>60%)
T	4.0000	<=10	
A_s	20.00		
DEM cell size	30	m	
β	15.00	%	
I	2.19	[1,2]	
S_f	80.00	[0,255]	

	Old	New		
E	0.492	0.464	t/ha	
R	128.05		MJ cm/ha h	
s	1.50		>=1	
P	400.00		mm	
rain frequency	100.00		days	
rain duration	5.00		hours	
V	0.35	3.1		
FSoil	0.50	0.50	(0,1]	
LAI	1.50	1.50	m^2/m^2; (0,6]	
S	0.0277		t m^2 h^2 / ha J cm	
OM	2.00		%	
Smoothing	1.00		[0.5-1.5]	
CI	1.00		[0.75,1.25]	
S_{pre}	0.0339		t m^2 h^2 / ha J cm	
T	0.9021	0.9021	<=10	<=4
A_s	20.00	20.00		
DEM cell size	30	30	m	
β	3.00	3.00	%	
I	0.4399	2.19	[1,2]	
S_f	80.00	80.00	[0,255]	