



# **Written Response Test**

**Source Booklet**

**9<sup>th</sup> International Geography Olympiad**

**Cologne, Germany**

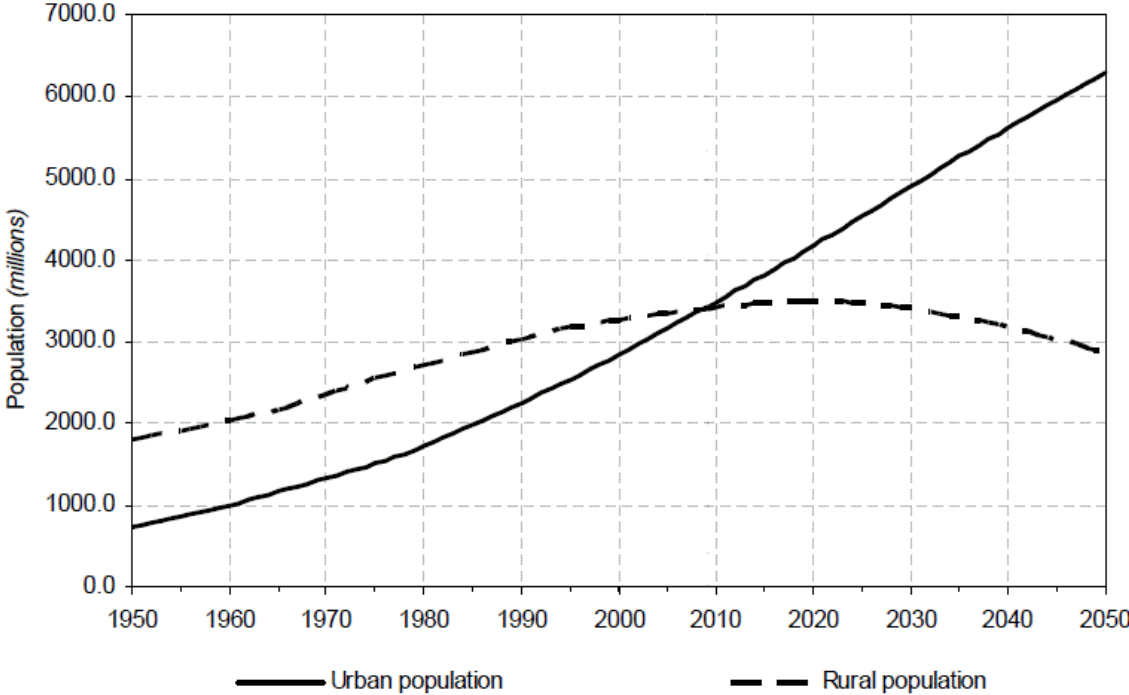
**21–27 August 2012**

**Do NOT open the booklet before instructed to do so by a supervisor.**

**Your answers will NOT be marked if you write them in this Source Booklet.**

# Section A: Urbanisation and Megacities

Source A1  
Urban and rural populations of the world, 1950-2050



World Urbanization Prospects: the 2009 Revision. New York: United Nations, 2010.

**Source A2**

**Populations of the urban agglomerations of megacities (in millions)**

Rank	1950		1975		2009		2025	
	City	Pop.	City	Pop.	City	Pop.	City	Pop.
1	New York	12.3	Tokyo	26.6	Tokyo	36.5	Tokyo	37.1
2	Tokyo	11.3	New York	15.9	Delhi	21.7	Delhi	28.6
3			Mexico City	10.7	São Paulo	20.0	Mumbai	25.8
4					Mumbai	19.7	São Paulo	21.7
5					Mexico City	19.3	Dhaka	20.9
6					New York	19.3	Mexico City	20.7
7					Shanghai	16.3	New York	20.6
8					Kolkata	15.3	Kolkata	20.1
9					Dhaka	14.3	Shanghai	20.0
10					Buenos Aires	13.0	Karachi	18.7
11					Karachi	12.8	Lagos	15.8
12					Los Angeles	12.7	Kinshasa	15.0
13					Beijing	12.2	Beijing	15.0
14					Rio de Janeiro	11.8	Manila	14.9
15					Manila	11.4	Buenos Aires	13.7
16					Osaka	11.3	Los Angeles	13.7
17					Cairo	10.9	Cairo	13.5
18					Moscow	10.5	Rio de Janeiro	12.7
19					Paris	10.4	Istanbul	12.1
20					Istanbul	10.4	Osaka	11.4
21					Lagos	10.2	Shenzhen	11.1
22							Chongqing	11.1
23							Guangzhou	11.0
24							Paris	10.9
25							Jakarta	10.8
26							Moscow	10.7
27							Bogotá	10.5
28							Lima	10.5
29							Lahore	10.3

*World Urbanization Prospects: the 2009 Revision. New York: United Nations, 2010.*

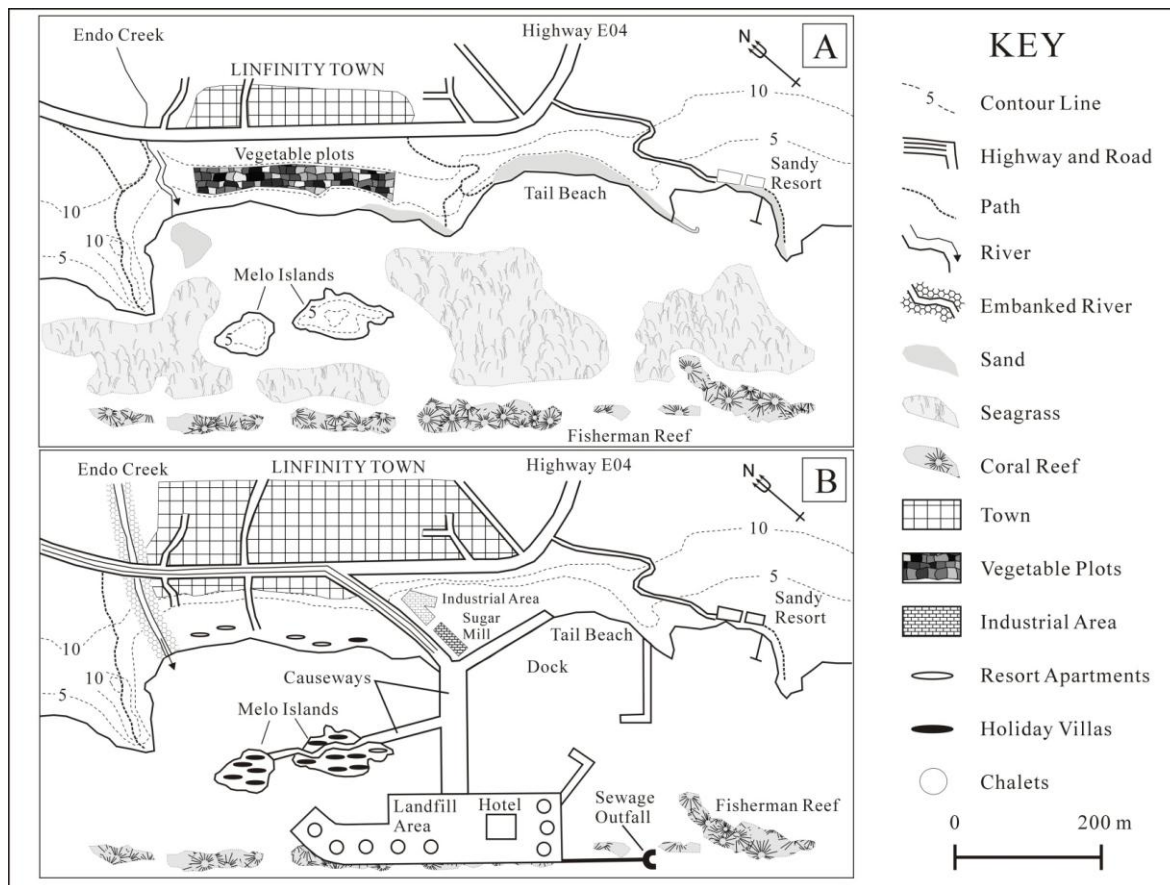
## Section B: Impacts of Coastal Development

### Source B1

#### Linfinity town and surrounding area

Map A shows the current features of the area.

Map B shows the proposed developments.

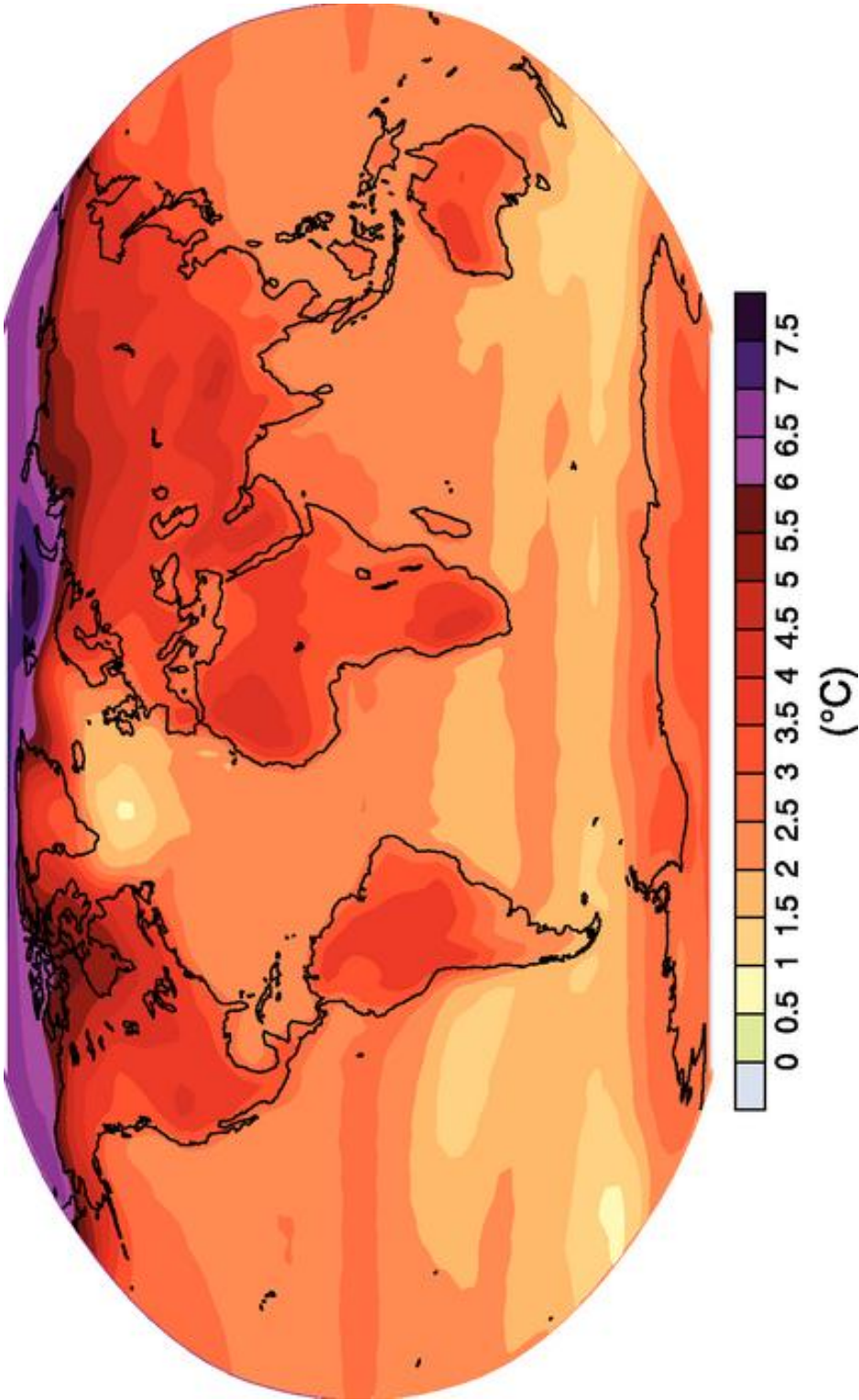


McDuell, B. (ed.) 1995: Questions and Answers – Geography. London: Letts Educational.

# Section C: Climate and Climate Change

Source C1

Projected surface temperature changes for 2090-2099, relative to 1980-1999

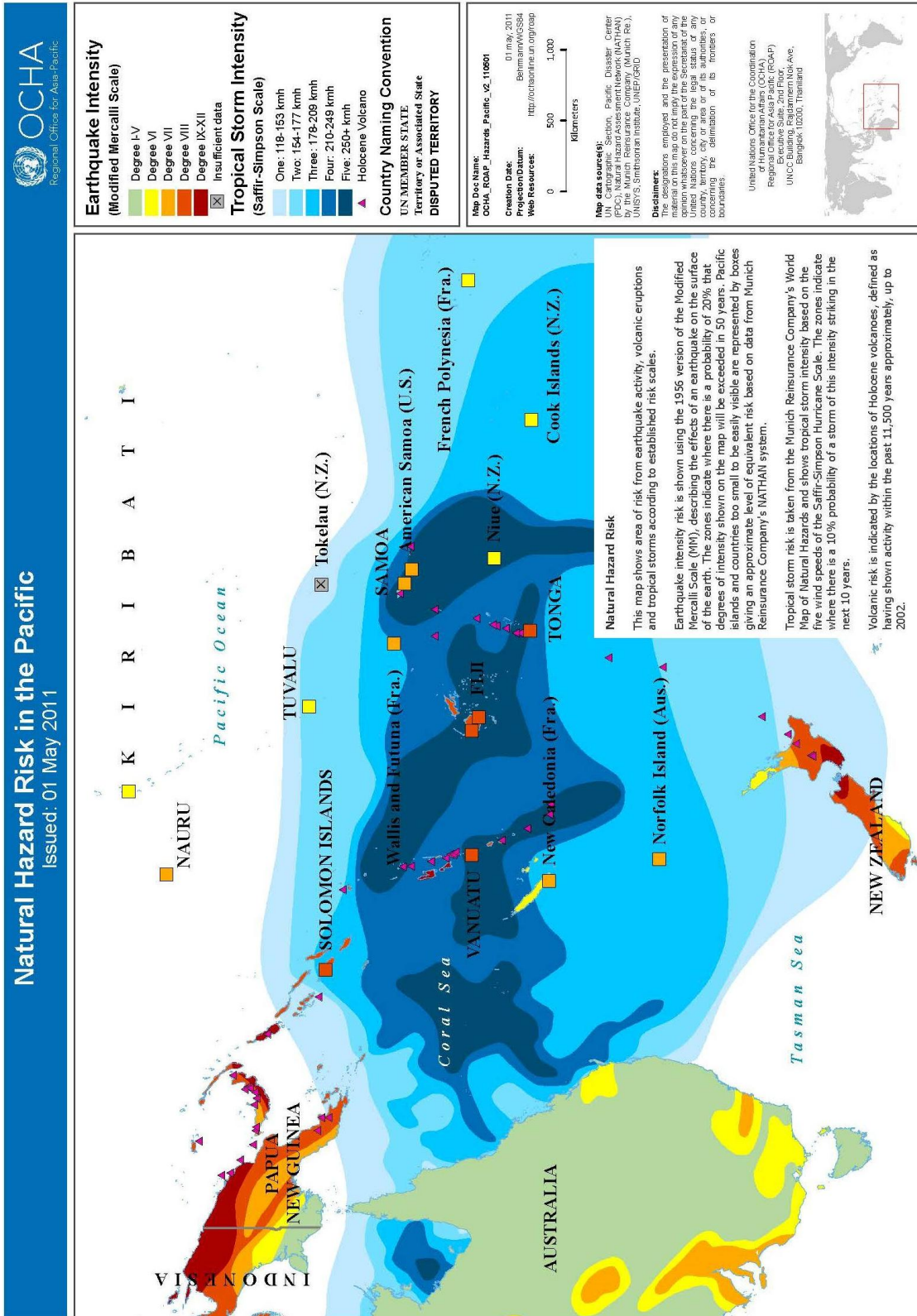


Climate Change 2007: Synthesis Report. Geneva: Intergovernmental Panel on Climate Change.  
[http://www.ipcc.ch/publications\\_and\\_data/ar4/syr/en/spms3.html](http://www.ipcc.ch/publications_and_data/ar4/syr/en/spms3.html).

# Section D: Vulnerability to Natural Hazards in the Pacific Islands

## Source D1

### Natural hazard risk in the Pacific



United Nations Office for the Coordination of Humanitarian Affairs. Bangkok, 2011.

<http://ochaonline.un.org/roap/MapCentre/HazardMaps/tabid/3725/language/en-US/Default.aspx>.

**Source D2****Some characteristics of selected Pacific Island Communities**

<b>Country or territory</b>	<b>Land area (km<sup>2</sup>)</b>	<b>Highest elevation (m)</b>	<b>Island type*</b>	<b>Population</b>	<b>Percent urban</b>	<b>Population density (people/km<sup>2</sup>)</b>
Cook Islands	237	652	V & A	15,537	72	66
Fiji Islands	18,333	1,324	PB	839,324	51	46
French Polynesia	4,000	2,241	V & A	263,267	57	66
Kiribati	717	81	A	97,231	44	136
Nauru	21	61	RL	10,163	100	484
New Caledonia	19,058	1,628	PB	246,614	62	13
Niue	260	68	RL	1,549	36	6
Palau	490	242	V	20,279	77	41
Papua New Guinea	462,243	4,509	PB	6,473,910	13	14
Samoa	2,935	1,857	V	179,645	21	61
Solomon Islands	28,446	2,447	PB	517,455	20	18
Tokelau	12	5	A	1,170	0	98
Tonga	650	1,033	V	102,724	23	158
Tuvalu	27	5	A	9,729	47	360
Vanuatu	12,109	1,879	PB	233,026	24	19

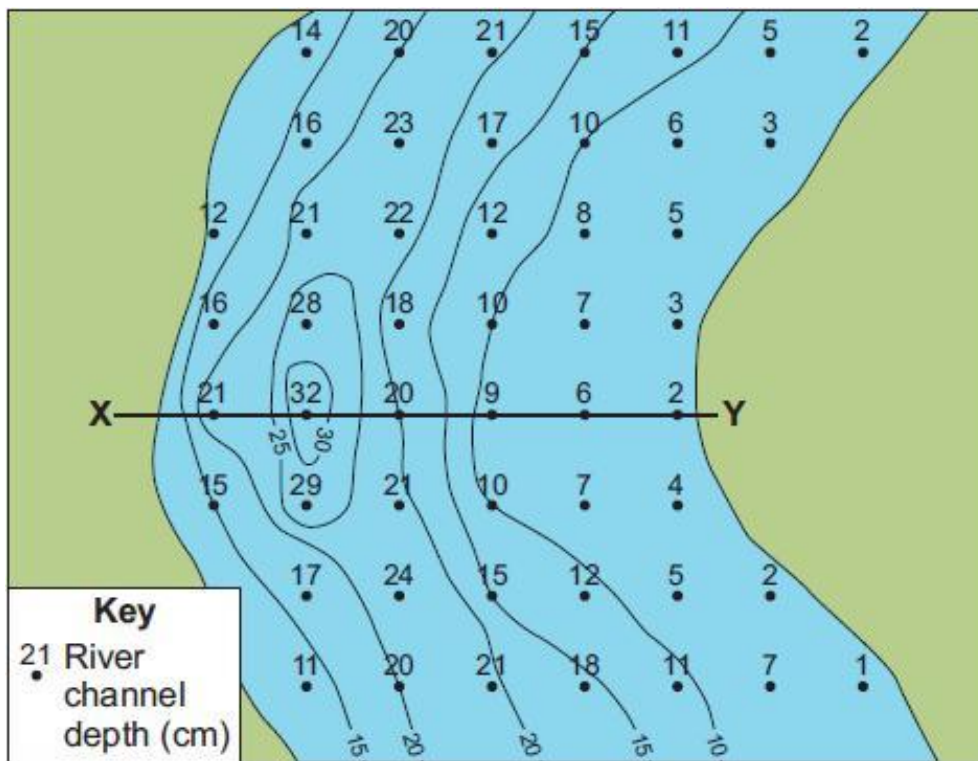
\* A = atoll(s); PB = plate-boundary or continental island(s); RL = raised limestone island(s); V = volcanic high island(s)

*John Campbell, University of Waikato, NZ.*

## Section E: Rivers

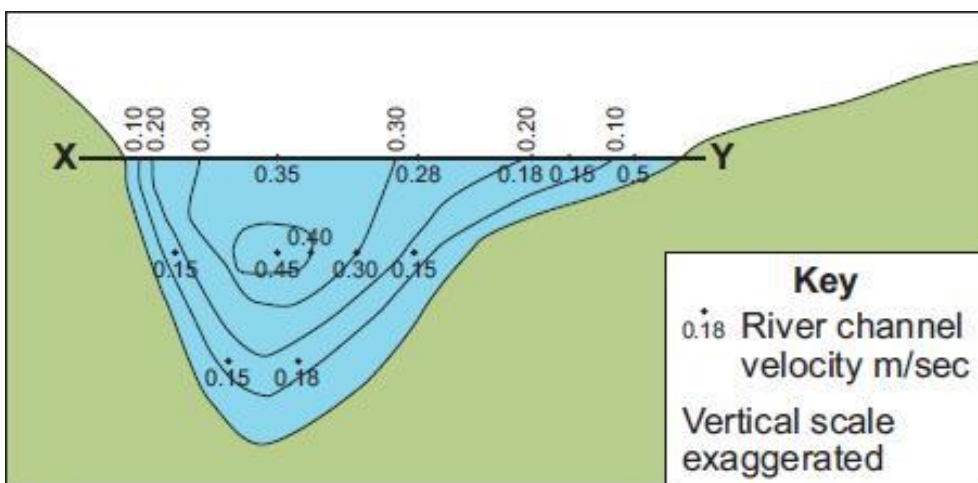
Source E1

Sketch plan of a meander showing river channel depth



Source E2

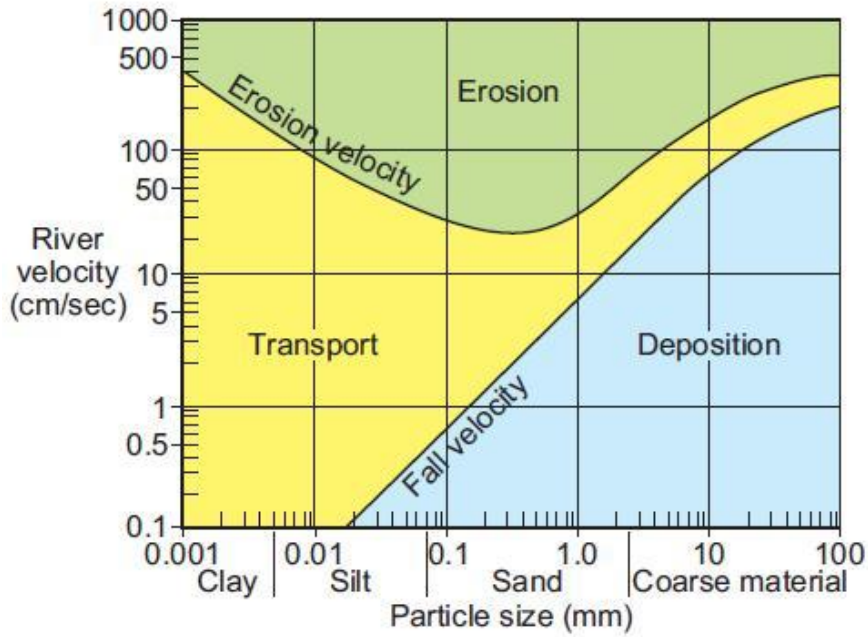
Sketch cross-section showing velocity along line X-Y in Source E1





**Source E3**

**Hjulström curve: the diagram shows the relationship in a river channel between particle size and velocity**



**Source E4**

**A series of potholes in a river bed**



*Photo by: Bruno van Erp Taalman Kip.*

# Section F: Agriculture

Source F1  
Satellite imagery from Google Earth

Image A



Image B



Image C



Image D



Image E

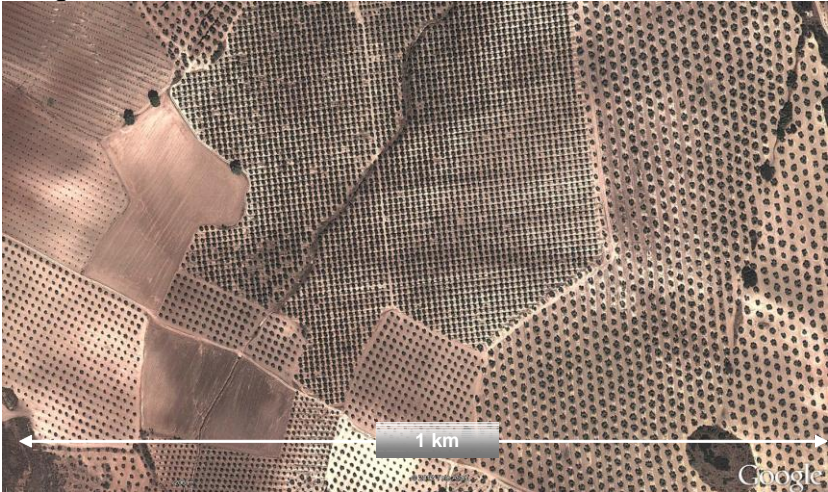


Image F

