

River Dart Study

GCSE Geography River Study Analysis

Study Date: 15/09/2024

Location: Devon, UK

Total Sites: 3

Generated on 25/07/2025

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Executive Summary

3

Total Sites

351.28m²

Total Area

0.87m/s

Avg Velocity

279.05m³/s

Total Discharge

Study Information

Date: 15/09/2024 **Location:** Devon, UK

Total Sites: 3 **Study Type:** River Cross-section Analysis

Notes: Comprehensive river study conducted at three sites along the River Dart in Dartmoor National Park. Weather conditions: Overcast, light breeze, 16°C - ideal conditions for field work. Group size: 4 students.

Methodology

Equipment: Measuring tape, depth probe, flow meter, digital calipers, GPS device

Sampling Method: Systematic point measurements across river width at 3 representative sites

Measurements: Cross-sectional profile, velocity at 0.6 depth, sediment size and roundness

Data Processing: Statistical analysis including Spearman's rank correlation for sediment relationships

Site Location Map

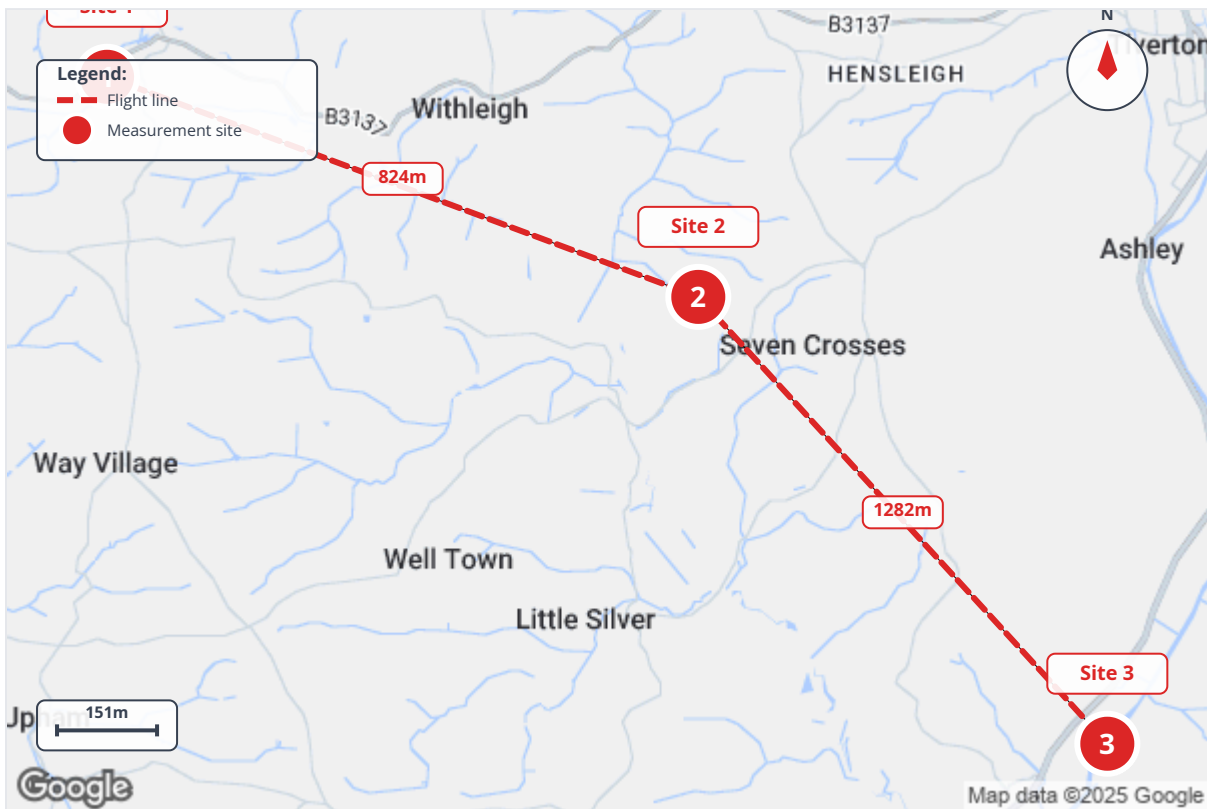


Figure 1: Location map showing measurement sites and inter-site distances

Cross-Sectional Area Summary

Measurement	Site 1	Site 2	Site 3	Summary
Width (m)	3.2	5.8	8.1	5.70
Average Depth (m)	25.22	19.30	19.58	21.37
Cross-Sectional Area (m ²)	80.71	111.94	158.62	351.28

Velocity Summary

Measurement	Site 1	Site 2	Site 3	Summary
Velocity (m/s)	1.24	0.83	0.55	0.87
Discharge (m ³ /s)	99.76	92.69	86.61	279.05

Sediment Analysis Summary

Measurement	Site 1	Site 2	Site 3	Summary
Sediment Size Average (mm)	44.80	29.60	15.50	29.97
Sediment Shape Average	1.80	3.50	4.60	3.30
Spearman's Rank Correlation	-0.927	0.794	0.855	0.240

Sediment Roundness Distribution

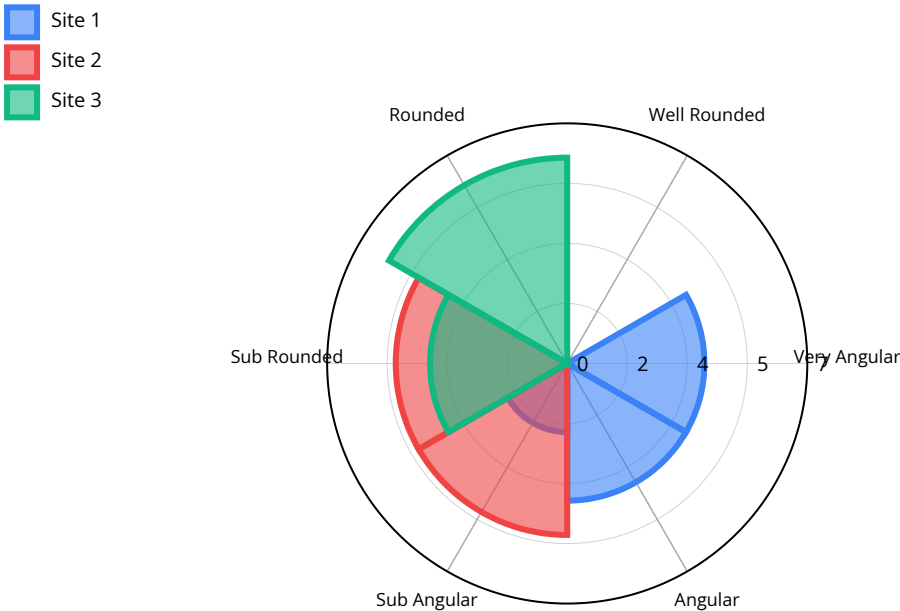


Figure 2: Wind rose chart showing sediment roundness distribution across all measurement sites

Site 1

River Width

3.2 meters

GPS Coordinates

50.891444, -3.549366

Weather Conditions

Overcast, 16°C, light breeze

Land Use

Moorland - natural
vegetation, minimal human
impact

Data Completeness

3/3 sections complete

Site Name

Upstream Site

Notes: Rocky riverbed with large granite boulders. Water very clear. Some small trout observed.

Site Photography



Primary Site Photo

No sediment sample photo available

Cross-Sectional Analysis

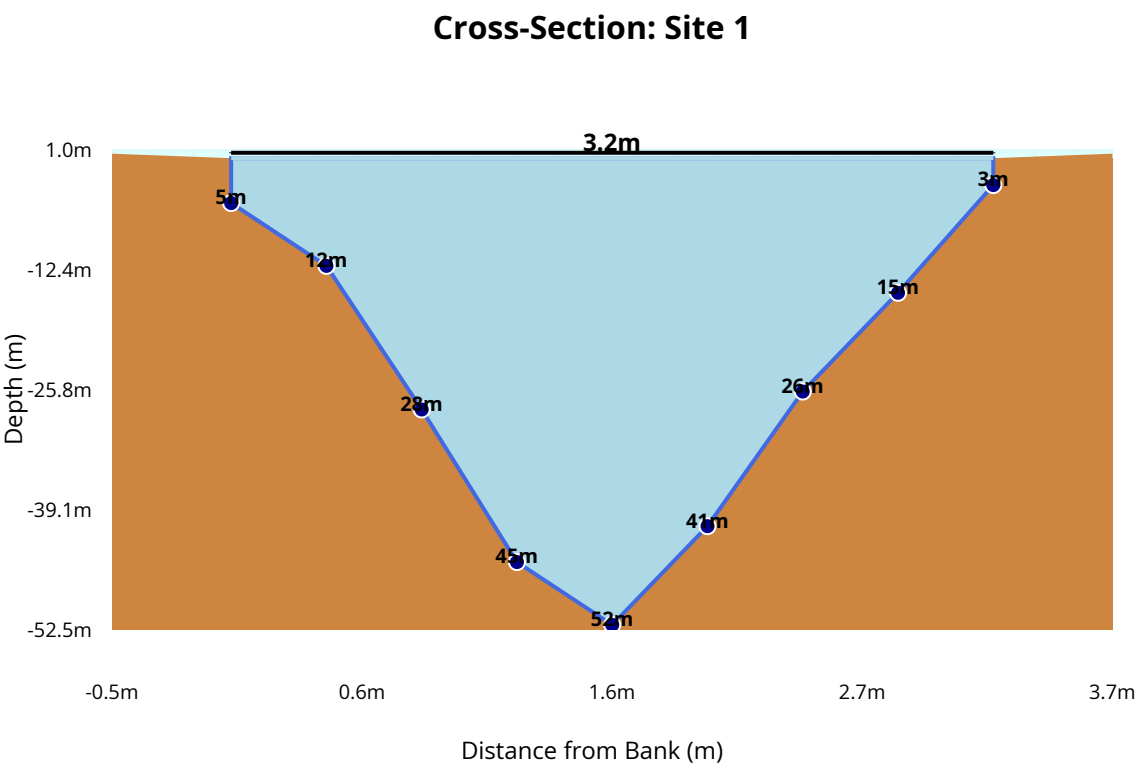


Figure 3: Cross-sectional profile for Site 1 showing depth measurements across river width

3.20

Width (m)

52.0

Max Depth (m)

25.2

Avg Depth (m)

80.7

Area (m²)

Raw Measurement Data

Point Number	Distance from Bank (m)	Depth (m)
1	0	5
2	0.4	12
3	0.8	28
4	1.2	45
5	1.6	52
6	2	41

Point Number	Distance from Bank (m)	Depth (m)
7	2.4	26
8	2.8	15
9	3.2	3

Velocity Analysis

1.24

Average Velocity (m/s)

99.8

Discharge (m³/s)

5

Measurements

Individual Velocity Measurements

Measurement #	Time (s)	Distance (m)	Velocity (m/s)
1	8.20	10.00	1.22
2	7.80	10.00	1.28
3	8.50	10.00	1.18
4	8.10	10.00	1.23
5	7.90	10.00	1.27

Sediment Analysis

44.80

Average Size (mm)

1.80

Average Roundness

-0.927

Spearman's Rank

10

Sample Count

Individual Sediment Measurements

Sample #	Size (mm)	Size Category	Roundness	Shape Description
1	45.00	Gravel	2.0	Rounded
2	52.00	Gravel	1.0	Very Rounded
3	38.00	Gravel	3.0	Sub-Rounded
4	41.00	Gravel	2.0	Rounded
5	48.00	Gravel	1.0	Very Rounded
6	35.00	Gravel	3.0	Sub-Rounded
7	56.00	Gravel	1.0	Very Rounded
8	43.00	Gravel	2.0	Rounded
9	39.00	Gravel	2.0	Rounded
10	51.00	Gravel	1.0	Very Rounded

Correlation Interpretation: Strong negative correlation between size and roundness

Site 2

River Width

5.8 meters

GPS Coordinates

50.886034, -3.541331

Weather Conditions

Overcast, 16°C, light breeze

Land Use

Mixed woodland and
farmland - moderate
human impact

Data Completeness

3/3 sections complete

Site Name

Middle Reach

Notes: Riverbed of mixed pebbles and sand. Some erosion on outer meander bends. Evidence of cattle access.

Site Photography



Primary Site Photo

No sediment sample photo available

Cross-Sectional Analysis

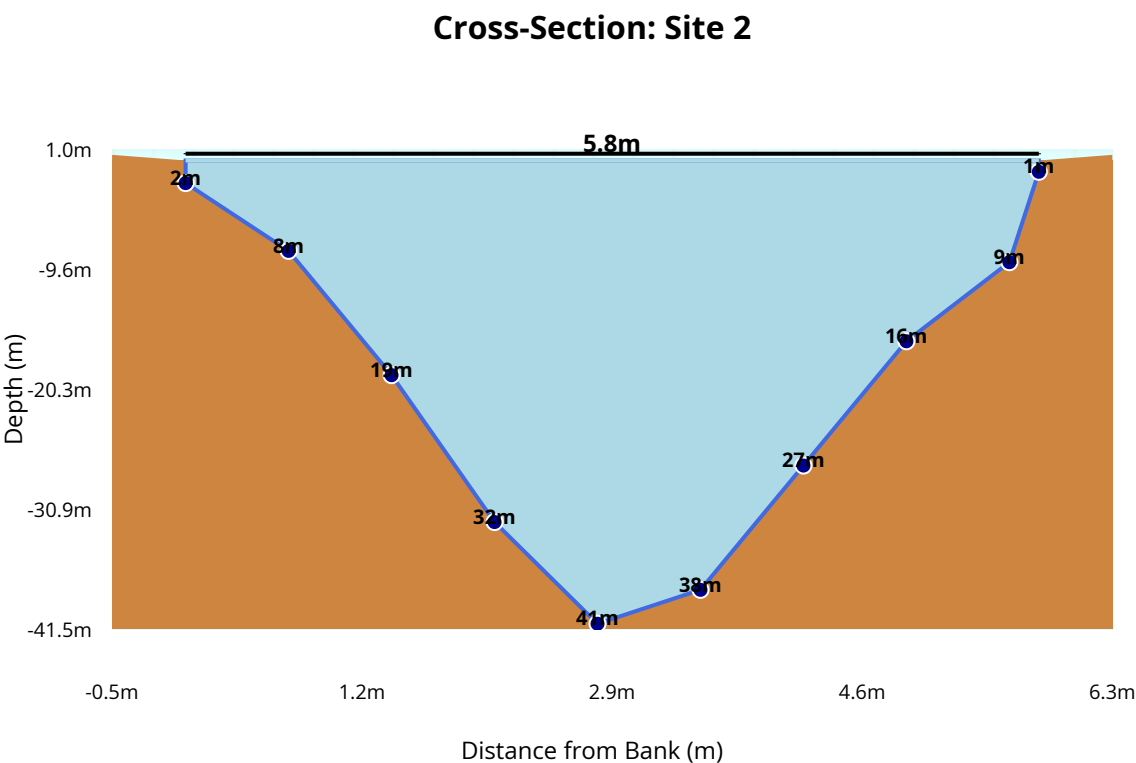


Figure 4: Cross-sectional profile for Site 2 showing depth measurements across river width

5.80

Width (m)

41.0

Max Depth (m)

19.3

Avg Depth (m)

112

Area (m²)

Raw Measurement Data

Point Number	Distance from Bank (m)	Depth (m)
1	0	2
2	0.7	8
3	1.4	19
4	2.1	32
5	2.8	41
6	3.5	38

Point Number	Distance from Bank (m)	Depth (m)
7	4.2	27
8	4.9	16
9	5.6	9
10	5.8	1

Velocity Analysis

0.828

Average Velocity (m/s)

92.7

Discharge (m³/s)

5

Measurements

Individual Velocity Measurements

Measurement #	Time (s)	Distance (m)	Velocity (m/s)
1	12.10	10.00	0.83
2	11.80	10.00	0.85
3	12.50	10.00	0.80
4	11.90	10.00	0.84
5	12.20	10.00	0.82

Sediment Analysis

29.60

Average Size (mm)

3.50

Average Roundness

0.794

Spearman's Rank

10

Sample Count

Individual Sediment Measurements

Sample #	Size (mm)	Size Category	Roundness	Shape Description
1	28.00	Gravel	3.0	Sub-Rounded
2	32.00	Gravel	4.0	Sub-Angular
3	25.00	Gravel	3.0	Sub-Rounded
4	30.00	Gravel	4.0	Sub-Angular
5	27.00	Gravel	3.0	Sub-Rounded
6	35.00	Gravel	4.0	Sub-Angular
7	29.00	Gravel	3.0	Sub-Rounded
8	31.00	Gravel	4.0	Sub-Angular
9	26.00	Gravel	3.0	Sub-Rounded
10	33.00	Gravel	4.0	Sub-Angular

Correlation Interpretation: Strong positive correlation between size and roundness

Site 3

River Width

8.1 meters

GPS Coordinates

50.875049, -3.535773

Weather Conditions

Overcast, 16°C, light breeze

Land Use

Agricultural land - higher human impact, some pollution

Data Completeness

3/3 sections complete

Site Name

Downstream Site

Notes: Wider, slower flowing section. Muddy banks with vegetation. Some pollution from agricultural runoff evident.

Site Photography



Primary Site Photo

No sediment sample photo available

Cross-Sectional Analysis

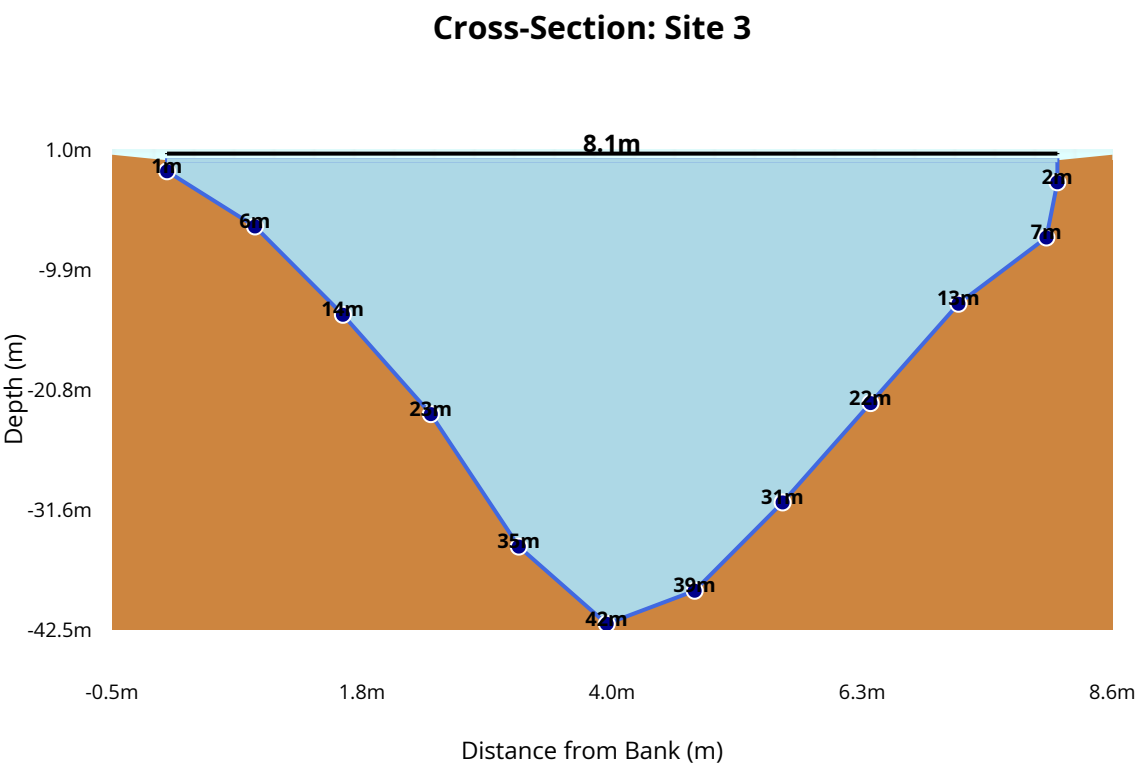


Figure 5: Cross-sectional profile for Site 3 showing depth measurements across river width

8.10

Width (m)

42.0

Max Depth (m)

19.6

Avg Depth (m)

159

Area (m²)

Raw Measurement Data

Point Number	Distance from Bank (m)	Depth (m)
1	0	1
2	0.8	6
3	1.6	14
4	2.4	23
5	3.2	35
6	4	42

Point Number	Distance from Bank (m)	Depth (m)
7	4.8	39
8	5.6	31
9	6.4	22
10	7.2	13
11	8	7
12	8.1	2

Velocity Analysis

0.546

Average Velocity (m/s)

86.6

Discharge (m³/s)

5

Measurements

Individual Velocity Measurements

Measurement #	Time (s)	Distance (m)	Velocity (m/s)
1	18.30	10.00	0.55
2	17.80	10.00	0.56
3	19.10	10.00	0.52
4	18.50	10.00	0.54
5	18.00	10.00	0.56

Sediment Analysis

15.50

Average Size (mm)

4.60

Average Roundness

0.855

Spearman's Rank

10

Sample Count

Individual Sediment Measurements

Sample #	Size (mm)	Size Category	Roundness	Shape Description
1	15.00	Gravel	5.0	Angular
2	18.00	Gravel	5.0	Angular
3	12.00	Gravel	4.0	Sub-Angular
4	16.00	Gravel	5.0	Angular
5	14.00	Gravel	4.0	Sub-Angular
6	19.00	Gravel	5.0	Angular
7	13.00	Gravel	4.0	Sub-Angular
8	17.00	Gravel	5.0	Angular
9	11.00	Gravel	4.0	Sub-Angular
10	20.00	Gravel	5.0	Angular

Correlation Interpretation: Strong positive correlation between size and roundness