



ENVIRONMENT
AGENCY

ESSEX

LOCAL FLOOD DEFENCE COMMITTEE

ANNUAL REPORT 1998/99





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ESSEX LOCAL FLOOD DEFENCE COMMITTEE

ANNUAL REPORT 1998/99

In accordance with Section 17 of the Environment Act 1995, the report on flood defence works carried out during the year 1998/99 in the Essex Local Flood Defence District is presented herewith, together with a summary of the accounts for that year.

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ESSEX LOCAL FLOOD DEFENCE DISTRICT



The aim of the Flood Defence function is to provide effective defence for people and property against flooding from rivers and the sea, and to provide timely warning systems such that effective actions can be taken to minimise the impact of flooding. This will be achieved by undertaking works that are technically sound, economically justifiable and environmentally acceptable.

PRINCIPAL STATISTICS

Total Length of Main River	1331 km
Total Length of Sea Defences	431 km
Major Tidal Barriers - Thameside	4
- North Essex	2
Tidal Flood Gates	240
Pumping Stations	20
Flood Risk Area - Fluvial	133 km ²
- Tidal	288 km ²
Area of Essex Local Flood Defence District	3665 km ²
Number in Workforce:	
Approved Emergency Workforce "core" number	93
Actual number during year	91
Major Infrastructure at Risk -	
• 6 Major Oil Installations (20% national storage)	
• 2 International Ports	
• 1 Nuclear Power Station	
• Densely populated urban zones (e.g. 40,000 live on Canvey Island alone)	

ESSEX LOCAL FLOOD DEFENCE COMMITTEE MEMBERSHIP

CHAIRMAN

Mr. T.K. Jagger
Twin Roofs
Victoria Road
Bulphan
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Mr. K.G. Hawkins
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APPOINTED BY THE REGIONAL FLOOD DEFENCE COMMITTEE

Mr. D.J. Fisher, JP (Vice-Chairman)
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Mr. R.C. Howard
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7 Belfairs Close
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Thurrock Unitary Council

Mr. R.D. Lee
65 Hall Road
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APPOINTED BY THE CONSTITUENT COUNCILS

Essex County Council:

Mrs. T.M. Chapman
30 South Street
Rochford SS4 1BQ

OBSERVER

Mr. J. Jenkinson MVO (Essex Area Environment
18 Woodview Close
Colchester CO4 4QW
Group)

OFFICERS SERVICING THE COMMITTEE

Acting Area Manager (until July 1998)
(August-November 1998)
Area Manager (from December 1998)
Regional Finance Manager
Operations Engineer
Management Accountant

Robert Runcie
Paul Hayward
Hilary Aldridge
Ian Ripley
Mick Whiley
Jim Chatburn

Area Flood Defence Manager (until December 1998)
Acting Flood Defence Manager (from Jan 1999)
Regional Flood Defence Manager
Catchment Engineer (until December 1998)
Acting Catchment Engineer (from January 1999)

John Hesp
Stephen Worrall
Steve Wheatley
Stephen Worrall
Tim Barritt

INTRODUCTION

The Eastern Area of the Environment Agency Anglian Region comprises Essex, Norfolk and Suffolk. The Area is an operational unit, headed by the Area Manager, who is a member of the Regional Management Team. Its structure is based on integrated catchment management to enhance the effectiveness of the efficient delivery of services across all Agency functions at Area level. Flood Defence personnel are split into client and contractor groups in recognition of the need to apply market testing to Agency operations in order to demonstrate its ability to provide value for money. The client group is headed by the Area Flood Defence Manager supported in Essex by a Catchment Engineer. The Emergency Workforce and supervisory staff are headed by the Direct Services Manager. This staff structure was modified with effect from 1 April 1999, the reasons for which are explained below.

The Easter 1998 fluvial floods that severely affected some parts of the country have generated a national project that has had a major impact on the majority of the year under review and will continue through the following year and beyond. Following the Easter floods the Agency commissioned an independent review, chaired by Peter Bye. "The Bye Report" recommended 85 priority actions, the phased implementation of which must be completed by April 2000. Implementation of the Action Plan is the Government's highest flood defence priority; it involves a huge workload and has a considerable impact on funding and staff resources. This runs parallel with the Agency's new supervisory role and several other flood defence initiatives such as the preparation of flood risk maps, which will be provided to planning authorities, and a comprehensive and ongoing asset survey of all sea and fluvial defences. Some additional staff have been recruited and many existing staff taken "off line" to undertake the work. With effect from 1 April 1999 the Catchments were split into Operations and Regulation teams to facilitate the exercise, and the "split" between client and contractor groups was relaxed to maximise partnership and efficiency.

The House of Commons Agriculture Select Committee Inquiry into Flood and Coastal Defence published its recommendations during the year under review and, depending upon the extent of its implementation, could have far reaching effects on the future funding and administration of flood defence. Arising from this is a requirement that the Agency should have overall supervisory responsibility for all land drainage and flood/coastal defence issues; this requirement has considerable implications in terms of financial and human resources.

Capital expenditure in 1998/99 has been dominated by the major scheme to protect the West Clacton and Jaywick frontage. In recognition of the expenditure involved and in response to the continued local funding commitment by the County Councils of Essex and Suffolk and the Unitary Authorities of Southend-on-Sea and Thurrock, the Ministry of Agriculture, Fisheries and Food raised the Grant Earning Ceiling to £5.7m from the £3.85m allocated in the previous year.

The Essex Seawalls Strategy is a major ongoing project which has emerged from the Essex Shoreline Management Plan. It involves examination of the Essex coastline in detail to identify and prioritise those frontages where ongoing maintenance or future capital schemes are viable. The Committee formally adopted the Strategy in October 1998. A presentation has been made to coastal landowners to describe the proposals, and similar events will be held in the future, as the Strategy evolves.

The Committee continues to use soft engineering techniques at appropriate locations and the programme to make beneficial use of dredgings from Harwich Harbour continues to the benefit of sea defences, conversation and recreation.

With the establishment of the new Unitary Authorities of Southend-on-Sea and Thurrock on 1 April 1998, Mr. N.M. Baker and Mr. R.D. Lee were appointed to the Essex Local Flood Defence Committee as their respective representatives. Essex County Council's allocation of seats on the Committee was reduced accordingly from seven to five. This resulted in Mr. T.C. Smith-Hughes leaving the Committee, Mr. G.R. Miles having already resigned.

Ms Hilary Aldridge has been appointed to the post of Eastern Area Manager. Mr. John Hesp, Area Flood Defence Manager, has been taken permanently "off line" to take on the role of Regional Project Manager of the Easter Floods Action Group.

STEPHEN WORRALL

Acting Area Flood Defence Manager (Eastern)

OPERATIONS REPORT - 1998/99

CAPITAL WORKS 1998/99

The Essex Local Flood Defence Committee's allocation from Anglian Region's Grant Earning Ceiling for 1998/99 was £5,700,000. The basic rate of grant from the Ministry of Agriculture, Fisheries and Food was 35%, with a 20% supplement for tidal and sea defence works.

This year's capital programme has been dominated by the major West Clacton and Jaywick Sea Defences Scheme, which accounted for over 70% of the total capital expenditure. Meanwhile attention continues to be directed towards providing protection to lower priority and rural areas where it is more difficult to demonstrate the economic justification required by government funding rules. The final out-turn figures for capital expenditure are set out in the following table. A schedule showing this expenditure split down scheme by scheme is included in the financial summary at the end of this report.

	1998/99 £K
Grant eligible work	5,886
Non grant eligible work	385
Capital salaries and consultants' fees	667
Total	6,938

Some major capital schemes are described briefly below, working geographically from north to south.

Parkeston Tidal Defences

Phase 2, Stage 2

Scheme No. MPB20110

Expenditure 1998/99 - £100,000

Works were completed in 1996 but there followed prolonged debate between the Engineer and the Contractor as to the total payment due for the work. The Engineer issued his final payment certificate during the year without agreement being reached. The Contractor attempted to pursue his claim for additional payment through the dispute resolution mechanisms provided in the contract, but in the Agency's view not in accordance with them. The Contractor referred the matter to the High Court. The case was heard in January 1999 and the Agency was completely successful. However, the Contractor remained dissatisfied and has appealed against the decision. The appeal is expected to be heard during 1999/2000.



WEST CLACTON AND JAYWICK SEA DEFENCES

Above: Rock extraction from Larvik Quarry, Norway

Below: Overtopping prior to beach recharge





WEST CLACTON AND JAYWICK SEA DEFENCES

Breakwater construction in progress



West Clacton and Jaywick Sea Defences

Scheme No. MPB20598

Expenditure 1998/99 - £4,930,000

Problems with erosion within each bay along this frontage highlighted that the breakwaters were constructed too far apart in the 1986-1988 scheme. Further analysis, modelling and design resulted in proposals to construct additional rock structures and sand recharge to improve the overall standard of protection to approximately 2,000 properties. The contract for these defences was awarded to HAM Dredging who commenced on site in January 1999. The works will be substantially completed by June 1999, ahead of programme, despite undertaking the construction through the winter months. Over 100,000 tonnes of Norwegian rock and 500,000 cubic metres of dredged sand from a licensed offshore site were used in the scheme, the total cost of which will be £8m.

Colne Barrier Monitoring

Scheme No. MPA20125

Expenditure 1998/99 - £30,000

There is an obligation to monitor the Colne Estuary for ten years after the barrier became operational. This year is the mid point of that period. Data was gathered during the summer and autumn of 1998. The report was still in preparation at the end of the year under review.

Althorne Tidal Defences

Scheme No. MPB21621

Expenditure 1998/99 - £494,000

This scheme provides a 1 in 50 year standard of flood protection to the riverside part of Althorne village on the River Crouch, using clay embankments won from on-site borrow pits. The contract was awarded to the Agency's Direct Services Group. Work began on site in July 1998 and was substantially completed in February 1999.

ESSEX SHORELINE MANAGEMENT PLAN

The aim of a Shoreline Management Plan (SMP) is to provide the basis for sustainable coastal defence policies within a sediment cell and to set objectives for the future management of the shoreline. The Essex SMP (Sub Cell 3D), which was formally adopted by the Essex Local Flood Defence Committee in January 1997, is a joint plan, sponsored by the Environment Agency and the Coastal District Councils.

ESSEX SEAWALLS STRATEGY

This study considered the whole of the Essex coastline (excluding Thameside, upstream of the Colne barrier and parts of the Tendring peninsula) to develop a policy for improvement works and future maintenance in accordance with the recommendations from the Shoreline Management Plan. The existing defence standard was examined, together with the costs of future maintenance and potential improvement works, which were measured against the land and property in each compartment. Of the 307km considered, 196km are recommended for continued maintenance with possible improvements, whilst 111km will be considered for alternatives which include realignment, but will depend upon long term studies.



WEST CLACTON AND JAYWICK SEA DEFENCES

Beach Recharge in progress



REVENUE WORKS 1998/99

Summary

In 1998/99 the Essex Catchment, representing the Essex Local Flood Defence Committee as Client, prepared and completed a programme of maintenance works to the value of £4.055 million, approximately 10% of which was competitively tendered, the balance being awarded to the Environment Agency Direct Services Group.

A summary of the expenditure on operation and maintenance works carried out on behalf of the Committee during 1998/99 (with the previous year's figures for comparison purposes) is given below:

	1997/98 £K	1998/99 £K
Maintenance of Sea and Tidal River Defences	2,014	2,249
Maintenance of Inland Waters	1,584	1,509
Emergency Works	304	297
Total	3,902	4,055

Revenue Works – General

The year saw few problems generated by storm events with little damage to seawalls - a testament to improved face protection resulting from continued investment in open stone asphalt and Canewdon blocks to previously vulnerable seawalls. The winter of 1998/99, although wet, saw evenly distributed rainfall with no exceptional floods. Risk One events were, in general, the worst that took place (Risk One being a normal winter flood). These levels of flow and rainfall enabled ponds, lakes, reservoirs and aquifers, to steadily replenish levels: the 'right sort of rain' for once.

The following specific revenue works are highlighted:-

- **Bridges:** Concerns over the condition of some non-highway bridges used by Agency plant and vehicles led to a load and construction survey being undertaken. This has highlighted problems with some structures. East Mill, Colchester was perhaps the worst Agency owned bridge. The cause was a proprietary pre-stressed beam system employed in the original construction. This had failed completely, only the surrounding concrete providing support. A full reconstruction was completed as a matter of urgency. Other, less major, repairs have been undertaken. More will follow. Problems with bridges not the responsibility of the Agency have been reported to the responsible bodies. Agency vehicles and plant are avoiding these bridges.

- Open stone asphalt groyne, Cudmore Grove, East Mersea: Following the success of open stone asphalt as a seawall facing system, it was decided to construct a beach retaining groyne employing the material placed over a clay core. With the co-operation of Essex County Council (the landowners) and English Nature the groyne was constructed near the site of a brushwood groyne project (which had not fared too well). The clay for the core was obtained by enlarging an existing pond in the Country Park. This enlargement has boosted the number of wildfowl using the pond.

The groyne has been in-situ for nearly a year and, as the photographs show, is performing very well so far. It should be noted that no material has been placed behind the structure – all the material being natural deposition.

- Easter Floods Actions - The Bye Report: As a result of the Easter 1998 floods and the subsequent Bye Report, the Agency has undertaken action and priorities to achieve the aims of the report. This work has been carried out within the Essex Catchment, is progressing well and should be completed on time.

Emergency Works

The year proved to be relatively quiet as far as tidal surges and storms were concerned. The number of large spring tides reaching manning thresholds at the Colne Barrier have increased.

Attention is drawn to the following emergency works:-

- Emergency Beach Recharge, Jaywick: Prior to the start of the capital scheme approx. 50,000 cubic metres of sand was moved by dumptrucks and 30,000 cubic metres of new sand imported to site by dredger. This work was urgently needed to replenish the foreshore at a time when implementation of the capital scheme was uncertain.
- Major Blockwork Repairs, Paglesham Wall: The above wall was protected by "Essex" type blocks which had deteriorated badly and required relaying or replacement. The decision was taken to replace with the heavier "Canewdon" type blocks which provide a much higher standard of protection for a similar unit cost. Long term maintenance costs should be greatly reduced as a consequence.

Floodgates and Barriers

- Repairs and renovations were undertaken at Cattawade Barrage north channel.
- Holland Sluice gate and operating mechanisms were refurbished.
- Tilbury Barrier is undergoing further maintenance to the bearing pads under the rollers. This work is being carried out by the Direct Services Group, is progressing to programme and will be completed before the flood alert season starts.
- The remainder of the barriers received routine inspection and maintenance as required.



EXPERIMENTAL OPEN STONE ASPHALT

Groyne at Cudmore Grove, East Mersea

Above: Before works

Below: Shortly after completion of works





Pitmire Weir, Lamarsh – River Stour

The collapse and undermining of the weir has been exacerbated by the transfer of Ely Ouse to Essex water

The weir will be replaced in 1999

Repairs to erosion at Deals Mill, Kelvedon (R. Blackwater) caused by Ely Ouse to Essex water transfers



Sluices and Pumping Stations

During 1998/99 routine maintenance and inspection were carried out on tidal and river sluices and the 20 pumping stations maintained by the Environment Agency in the Essex Catchment. In particular, Marsh House, Dengie, pumping station was overhauled, as were several Canvey Island pumps.

Statutory Main River

There were no variations to the statutory length of Main River during 1998/99.

Non-tidal Main River	1,331 km
Tidal Main River	<u>308 km</u>
Total:	1,639 km

Non Tidal Main River

A wet winter maintained good flows in all Essex rivers. Weed growth is usually somewhat inhibited in such conditions which also reduce the amount of siltation. The consequences of managing rivers to enhance natural features are still being felt with dredging, formerly a major part of routine maintenance, now being a minor part of winter work.

Ely Ouse to Essex Transfer Scheme flows were not as significant as in recent years, but erosion repairs are still outstanding on the Stour and Pant systems.

Non-Main River Watercourses

Problems arising from lack of maintenance by riparian owners of non-main river watercourses has been addressed jointly with the Essex local authorities. A good practice guide continues to be implemented with regard to the respective roles and responsibilities for enforcement action under the Land Drainage Act 1991. Enforcement action arising from illegal and inadequate culverting is increasing and represents a considerable workload

Emergency Workforce

Although the Environment Agency has established a Direct Services Group to manage the workforce, the Agency's National Board has undertaken to maintain an Emergency Workforce to respond to tidal and fluvial flooding. For 1998/99 in Essex this represented an establishment of 93, including mechanical and electrical fitters. At the end of March 1999 the actual number on the workforce was 91. In order to retain a broad skills base for emergency situations, the workforce has been deployed on a wide range of work including routine maintenance, heavy sea defence construction and mechanical and electrical activities.

Key Points in the Year

25/26 April 1998 -

Approx. 80 metres of the Thames Tidal Defences failed at Tilbury Port as a result of unconsented materials storage by a civil engineering contractor working for the Port of Tilbury. All the damaged piles have been replaced and strengthened to a design approved by the Agency. The main contractor was prosecuted and fined £3,500 plus £1,566 costs. Whilst the Port of Tilbury accepted responsibility as landowner, legal proceedings were not taken further.

18 May 1998 -

Alan Hurst, MP for Braintree and a member of the House of Commons Agriculture Select Committee reviewing flood and coastal defence, met the Essex LFDC Chairman, the Regional FDC Chairman, Essex LFDC Member, Ray Howard, and the Catchment Engineer to discuss key issues relating to flood defence delivery in Essex. Discussions covered the Ministry's Project Appraisal Guidance Notes, the EC Habitats Directive, flood warning and other Committee concerns. It was a constructive meeting and provided Mr. Hurst with an excellent and timely overview of key issues in Essex.

17 July 1998 -

The Area Manager, Area Fisheries Ecology & Recreation Manager and Essex Catchment Engineer met the Chairman and Secretary of the River Stour Trust to discuss issues relating to navigation and land drainage consents. It was also agreed that a scoping study be promoted between the Trust and the Agency to consider the feasibility of extending the navigation for powered craft.

21/22 July 1998 -

The Catchment Engineer attended a field visit to Essex by the RSPB, members of the Humber Estuary Strategy Group and English Nature. Foreshore recharge sites and Orplands managed retreat scheme were inspected as examples of management strategies for parts of the Humber.

11 September 1998 -

The Essex Local Flood Defence Committee Annual Inspection of Works. Sites were inspected on the River Crouch, including the Althorne Tidal Defences Scheme. This was followed by a visit to the Tilbury Dock Barrier on Thameside.

12 October 1998 -

Because of major impact on work patterns for staff, the Catchment Engineer attended a briefing by Ed Gallagher, Chief Executive of the Environment Agency, at the Regional Office in Peterborough. The Chief Executive focused on the Easter 1998 Floods, the Bye Report and the actions and priorities the Agency is now setting.

20 November 1998 -

The Anglian Region held a flood plain planning seminar. Flood Defence and Planning staff attended to consider the consistent implementation of planning controls on areas liable to flood. New national initiatives are being prepared and an improved dialogue with planning authorities is to be developed.



Failed revetment at East Mersea Youth Camp



Illegal dumping in the watercourse at East Dock Sewer, Tilbury



Dredging on the River Stour



**New safety works for structures
Asheldham Brook – Pump outfall**

- 27 November 1998 - Presentations on the Essex Seawall Strategy were made by the Agency, English Nature and MAFF staff to members of the National Farmers' Union and Country Landowners' Association. The objective was to increase landowner understanding of the issues surrounding long term sustainable management policies for the Essex coast.
- 21 January 1999 - A Partnering Workshop was held between the Flood Defence Client and the Direct Services Group. This is a new partnering initiative to support the resource needs for the Bye Report Easter Flood Actions.

Maintenance Expenditure 1998/99

In carrying out maintenance works the Essex Catchment has endeavoured to provide value for money, working within the necessary budgetary controls.

	<u>£000</u>
• Sea Defence General, Floodgates and Barriers: Seawall maintenance, repairs mainly to toes and revetment. Maintenance and operation of 240 gates, 4 Thameside barriers, Colne Barrier and Cattawade Barrage.	2,249
• Structures: Routine maintenance and repair of river control structures.	511
• Pumping: Operation, maintenance and power supply to 20 pumping stations.	82
• Banks, Embankments, Weedcutting: Grass cutting and minor reinstatement. Weed cutting along identified lengths on 1331km of Main River.	531
• Dredging: The removal of silt and excess vegetation along identified lengths of 1331km of main River.	30
• Clearing obstructions: Removal of debris and obstructions from rivers, mainly at control structures.	355
• Emergency: Sea defences and tidal waters. Fluvial.	246 <u>51</u>
Total	<u><u>4,055</u></u>

EMERGENCY PLANNING

The most significant flood warning event during the year under review was the Easter flood in April 1998. Essex was not subjected to the same high rainfall intensities that affected other parts of the country; nevertheless large amounts of rain did fall and Amber Fluvial Flood Warnings were issued across the county. In Essex there were no reports of property flooding from Main River.

The remainder of the year was comparatively quiet, with several low level, but no major, Tidal and Fluvial Flood Warnings. The Automatic Voice Messaging (AVM), Floodcall and Media warning systems were used on several occasions and performed satisfactorily. Following the Easter floods the Agency set out to review and to improve the flood warning service it offers. Most of the work of the Flood Warning Section during 1998/99 was in response to the Easter floods and the Easter Floods Action Plan. This has severely taxed staff resources and will be partly addressed by a third member joining the team in April 1999.

LOCAL ENVIRONMENT AGENCY PLANS

Local Environment Agency Plans (LEAPs) are fully integrated plans covering all areas of interest to the Environment Agency. They have evolved from the Catchment Management Plans instigated by the former National Rivers Authority in 1990, and contain the Agency's additional responsibilities for waste regulation and integrated pollution control. LEAPs provide a vision for each river catchment, together with policies, objectives and actions to achieve overall improvements to the environment. Partnerships with other organisations are keenly sought. The Flood Defence function has an important role in these plans, alongside all the other functions within the remit of the Environment Agency.

Within the Essex Local Flood Defence District there are two such plans - North Essex and South Essex. The North Essex LEAP Action Plan was published in November 1998 and was well received. The Draft South Essex LEAP is in production on the same lines and consultations have taken place to discuss potential issues.

CONSERVATION AND FLOOD DEFENCE

In spite of heavy development in parts of the County, the Essex Local Flood Defence District contains many features of conservation interest. Even before legislation placed a positive duty of conservation enhancement upon the Environment Agency and its predecessors the Essex Local Flood Defence Committee recognised the effects that many of its works could have on the environment and took into account the need to conserve. Before undertaking any capital or revenue works there is full consultation with conservation interests. This may involve Environmental Surveys and, in the case of major capital schemes, Environmental Assessments. The many statutory conservation designations within Essex demonstrate how important the area is in a national and European context and highlight how the work of the Agency complements the value of the habitats, also reinforcing the importance of working closely with English Nature.



Sensitively completed maintenance on Tilty Brook



New development at Bocking beside River Blackwater flood plain

[Developer allowed to raise level in flood plain, provided equal storage was given by creating a riverside wetland. Conservation value enhanced without compromising flood risk]

There are two statutory designations/directives that recognise the international conservation importance of natural habitats -

- Special Protection Areas (SPA) designated under the EC Birds Directive for the value of wildfowl and waders.
- Special Areas of Conservation (SAC) designated under the Habitats Directive for the habitats and species value of the area.

Other designations include -

- Sites of Special Scientific Interest (SSSI)
- Areas of Outstanding Natural Beauty (AONB)
- National Nature Reserves (NNR)
- Local Nature Reserves (LNR)
- County Wildlife Sites

Nearly all of the Essex coast is designated as a SPA, these areas include the River Crouch Marshes, the Colne Estuary, Foulness, the Dengie Peninsula, the Blackwater Estuary, the marshes in the Benfleet and Southend area, the Walton Backwaters and the Stour/Orwell Estuary.

Parts of the Essex coast, Foulness, Crouch Marshes, Blackwater Estuary and the Colne Estuary, have been put forward to the European Union as a candidate SAC. All SACs and SPAs have to be currently designated as Sites of Special Scientific Interest under the Wildlife and Countryside Act 1981. In relation to the potential impact of flood defence operations on these sites, the Agency is a Competent Authority with a lead role in ensuring their protection.

Catchment staff continue to liaise closely with the 4 Countryside Management Projects, local conservation trusts and English Nature in identifying opportunities to enhance the environment in Essex whilst carrying out flood defence works, examples of such initiatives being -

- A partnership project has been initiated with Braintree District Council. The main aim is to combine flood attenuation lakes with the John Ray Park - an ambitious scheme to transform old allotments, a former tip and derelict land in the centre of Braintree. Initial works and surveys have been undertaken and prospects look good. The conservation and recreational value of the works, given the location in the centre of a large town, need to be given much care.
- Advice and minor assistance continued for the River Colne Countryside Project in various water related works.

When such works cannot be justifiably charged to flood defence funds, the Catchment has also from time to time, upon request, undertaken conservation works on a rechargeable basis.

WATER LEVEL MANAGEMENT PLANS

Water Level Management Plans (WLMPs) are a Ministry of Agriculture, Fisheries and Food (MAFF) initiative developed in 1994. The Plans provide a means whereby the water level requirements for a range of activities in a particular area, including agriculture, flood defence and conservation can be balanced and integrated. The *"Conservation Guidelines for Drainage Authorities"* (MAFF/DoE/Welsh Office, 1991) state that WLMPs should be prepared for areas where water levels are managed, the highest priority going to internationally important sites such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites.

Within the Essex Local Flood Defence District the Environment Agency is currently responsible for the preparation of some 33 Water Level Management Plans. Because the Environment Agency controls the water levels at these sites it is therefore responsible for preparing their WLMPs. These Plans have been endorsed by English Nature as written agreements. The Plans are treated as working documents and will be reviewed on a regular basis and updated or revised if the objectives are unable to be met or if circumstances change. They also seek to provide continuity and stability for these important sites and, by identifying opportunities, will allow the Flood Defence Committee, in undertaking its statutory duties, to further the conservation of wildlife and the enhancement of natural beauty.

Work on WLMPs during 1998/99 included Cattawade Marshes, Holland Haven and Roman River Marshes.



MANAGED REALIGNMENT
Orplands – Blackwater Estuary - A new marsh has regenerated itself



BRUSHWOOD POLDERS
River Crouch - the polders trap silt

SOFT ENGINEERING

Brushwood Polders

Maintenance work to the value of £70K was undertaken as part of a four year tendered contract. In total 2,300 metres of repairs were effected to 14 locations. The increasing use of willow cuttings has proved more efficient and effective than the previous fir tree toppings, requiring less repair work following storm damage.

Twice yearly monitoring of accretion levels continues, again by private contractor, with overall average gains of 66mm; the results are appended at the end of this section. It is worth noting that the amount of easterly winds in 1998/99 assisted in pushing sediment into the Essex estuaries.

Coastal Re-alignment (Managed Retreat)

In 1998/99 work concentrated on the Abbots Hall (Great Wigborough) and Orplands (Bradwell) sites.

At Abbots Hall the Agency has been experimenting, in conjunction with MAFF and English Nature, on artificially controlling saline water levels to both encourage saltmarsh plant growth and provide habitat for nesting birds. An annual meeting is held on site to assess the results of the site and produce a programme for the following 12 months.

At Orplands the main activity is the ongoing monitoring which is undertaken by HR Wallingford Ltd under a five year contract. The summary of their work is as follows:

The monitoring programme for the period August 1998 to March 1999 focused on the following variables:

- Levels of accretion/erosion as determined by spot height measurement along cross sections and between Feno marker pairs.
- Soil Redox potential.
- Biota, i.e. colonisation by halophytes and macroinvertebrates and utilisation by fish, crustacea and birds.

Major distribution channels in the vicinity of both breaches exhibited signs of bed scouring. This was particularly noticeable in area A where substantial widening of the breach and erosion of the inside of the old seawall immediately adjacent to the breach had occurred.

The embankment running along the landward margin of the site also exhibited a reduction in level along its length, but this seems most likely due to compaction rather than erosion.

Elsewhere in both areas, a tendency for accretion was apparent over most of the site surface.

The control saltmarsh showed no discernible change in level from previous surveys although a suggestion of cutback of the seaward edge of the marsh was apparent on one cross section.

Soil Redox levels in both inundated areas are similar and comparable to those in the control saltmarsh indicating that a new equilibrium representative of typical saltmarsh conditions is developing.

The number of halophyte species colonising the site has increased, by six, from 1997 and there has been a significant increase in vegetated ground cover. The density of vegetation has also increased in both areas.

Mobile animal species, such as fish and crustacea, enter the site on the rising tide and polychaete worms and gastropod mollusc *Hydrobia* have become well established throughout the area.

Birds, both wintering and breeding species, continue to make extensive use of the area as feeding, roosting and nesting grounds.

Foreshore Recharge

In November 1998 work commenced on the joint venture recharge project with Harwich Haven Authority. By the end of March 1999 the following quantities had been placed:-

	<u>Total Required (m³)</u>	<u>Placed to March 1999 (m³)</u>
Jaywick	30,000	21,000
Wallasea	10,000	3,000
Horsey	20,000	8,000
Cob Marsh, W. Mersea	15,000	2,000
Tollesbury	50,000	19,000
Old Hall, Tollesbury	100,000	14,000
Totals	225,000 m ³	67,000 m ³

The total now placed since 1989 is over 800,000 cubic metres of harbour dredgings of a sand, shell and stone mix.

1998 also saw the first trial placings of fine sediments as an aid to flood defences, with 20,000 cubic metres being placed at both Horsey and Shotley.

Again in co-operation with Harwich Haven Authority, MAFF, English Nature and Westminster Dredging, a new technique was developed for placing of fine sediments via a pipeline. This proved very successful with new saltmarsh plants establishing themselves within weeks of placing the material.



THE PROBLEM
Eroded salt marsh - sea wall under threat



THE SOLUTION
Recharge to threatened areas



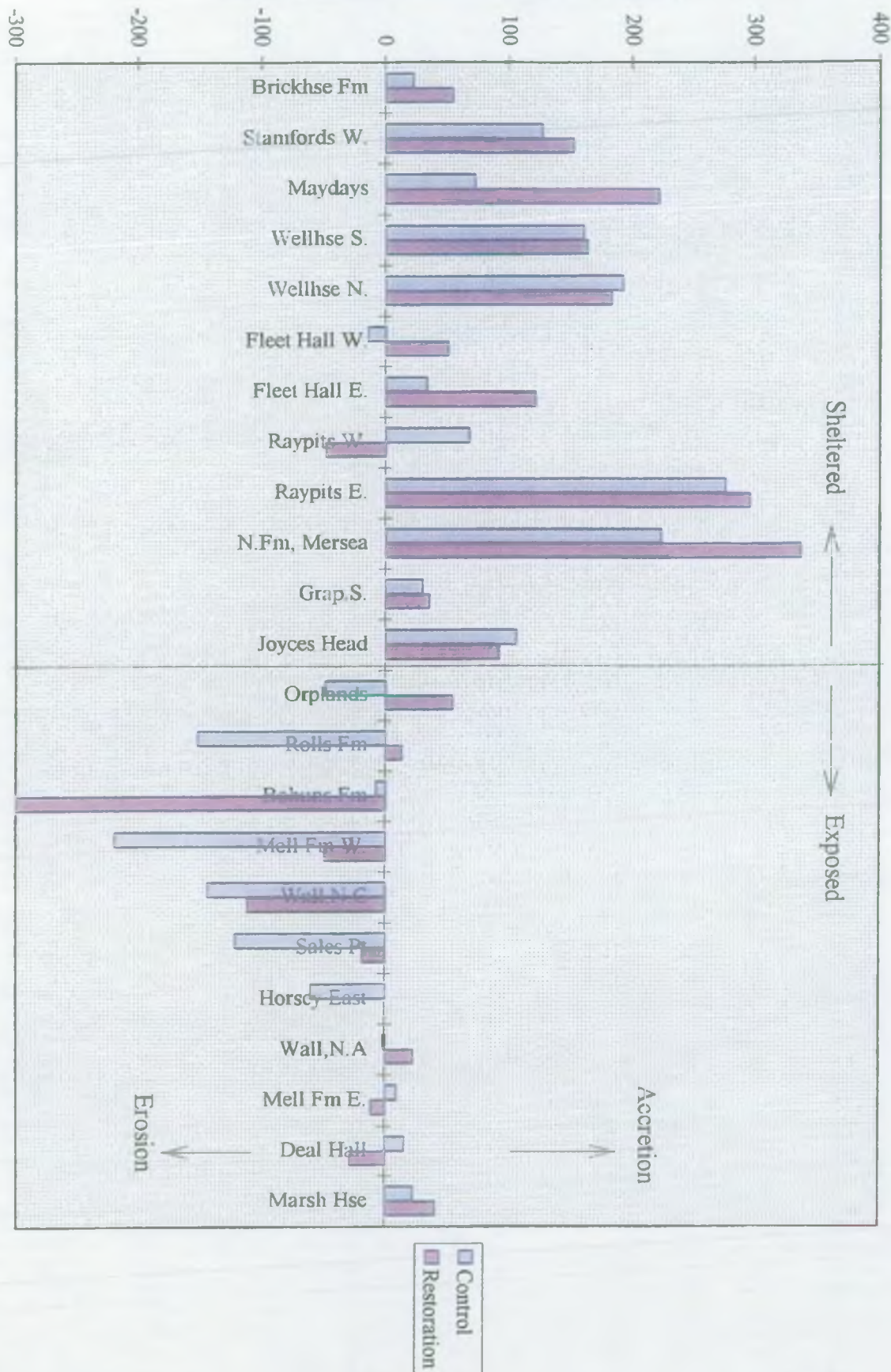
THE PRODUCT
Recharged foreshores to control erosion



FORESHORE RECHARGE
Fine sediment pumped to the front of Horsey Island north sea wall
Before and after pumping



Change in mudflat surface Oct 92 to Oct 98 (mm)



Results to October 1998 (sites ordered by max.fetch)



Anglian Region - Eastern Area

Monitoring of Salting Restoration Project - Summary of 78 Months Monitoring Programme

LOCATION	CONTROL SITE [mm]				RESTORATION SITE [mm]			
	OCT 97	OCT 98	APR 99		OCT 97	OCT 98	APR 99	
Horsey East	-54	-61	-56					
North Farm, Mersea	+190	+223	+291		+315	+337	+370	
Maydays	+68	+72	+105		+199	+221	+236	
Wellhouse North	+184	+192	+195		+166	+183	+193	
Wellhouse South	+147	+160	+158		+144	+163	+172	
Brickhouse Farm	+23	+22	+21		+24	+54	+62	
Joyces Head	+97	+106	+106		+88	+92	+90	
Mell Farm East	-24	+9	+16		-81	-12	+24	
Mell Farm West	-197	-220	-210		-56	-50	-52	
Bohuns Farm	+22	-8	-22		-241	-300	-352	
Rolls Farm	-120	-152	-160		+1	+13	+13	
Orplands	-39	-49	-55		+55	+54	+51	
Sales Point	-110	-122	-64		-73	-19	-14	
Marsh House	+26	+22	+38		+15	+40	+56	
Deal Hall	-38	+15	+29		-48	-29	-28	
Stamfords West	+120	+127	+125		+128	+152	+161	
Stamfords East	Control site enclosed				+107	+111	+125	
Raypits West	+43	+67	+88		-41	-48	-37	
Raypits East	+237	+275	+314		+259	+296	+334	
Wallasea North A	-81	-2	+35		-3	+22	+54	
Wallasea North B	No control				+16	+88	+149	
Wallasea North C	-81	-144	-140		-99	-112	-71	
Grapnells North	No control				+222	+254	+290	
Grapnells South	+11	+30	+80		+20	+35	+70	
Fleet Hall West	-15	-15	-6		+39	+50	+64	
Fleet Hall East	+28	+33	+49		+116	+121	+138	
TOTAL	393	580	937		+1272	1716	2098	
AVERAGE	+17	+24	+41		+49	+66	+81	
* Recharged								

HYDROLOGICAL REPORT

Rainfall

The monthly rainfall totals are shown in the following table.

Month	1961-90 Long Term Average (mm)	1998/99	
		Actual (mm)	% Average
April 1998	42	81	192%
May 1998	45	15	33%
June 1998	48	74	154%
July 1998	47	25	54%
August 1998	48	28	58%
September 1998	49	82	166%
October 1998	51	84	165%
November 1998	57	49	87%
December 1998	53	52	98%
January 1999	50	52	104%
February 1999	33	18	55%
March 1999	44	35	80%
Total for year	567	595	105%

The long period of below average rainfall ended with the year under review. Although half the months of the year received less than average rainfall, some months were well above average, April 1998 receiving nearly double the monthly average.

Soil Moisture Deficit

The year under review began with a low soil moisture deficit in April 1998 but rose steadily through May to August, peaking twice above average at the beginning and very end of September. The SMD then steadily declined to well below average through October to December, remaining fairly stable during January 1999. It began to rise slowly but steadily during February to just above average and started falling back below average during March.

River Flows and Fluvial Events

During 1998/99 5 Amber and 15 Yellow fluvial Warnings were issued for Essex.

Rivers Supported by the Ely Ouse to Essex Water Transfer Scheme

Ely Ouse transfers ceased during the April rainfall event and then operated at a lower rate, ceasing in November. The rivers peaked around 27 December, high flows continuing through January with sporadic bursts. Normal flows returned in February.

Rivers NOT Supported by the Ely Ouse to Essex Water Transfer Scheme

Unsupported rivers rose rapidly during the first half of April and then steadily declined, a few being very low, for example the River Box. Flows recovered slightly in August and into September, rising rapidly in mid October causing many flood events, through to mid November where they remained at the level expected for the time of year. High flows prevailed during January with sporadic burst, returning to normal in February.

Groundwater Levels

The year under review began with all aquifers showing a slow increase in levels, although remaining below average. The rising trend stabilised in February.

Storm Tide Warning Service

The Storm Tide Warning Service operated from 1-30 April 1998 and from 1 September 1998 to 31 March 1999. However, the Environment Agency was kept informed of particularly high astronomical tides occurring during the summer months.

4 Amber and 106 Yellow tidal flood warnings were issued for Essex during 1998/99.

FINANCIAL REPORT

The following notes apply to the accompanying statement:-

FINAL ACCOUNTS 1998/99 – VARIANCE ANALYSIS

Line Nos

- 8. Operating and Management expenditure at £7235k was £9k or 0.12% less than the revised budget. Savings of £13k were made on maintenance works and an additional £4k was spent on administration and general charges.
- 16. Total income at £9924k was £37k or 0.37% more than the revised budget. Asset sales and investment income being more than forecast.
- 21. Total capital expenditure was £3k more than the revised budget of £6935k, a variance of 0.04% and the maximum MAFF Grant Income was achieved,
- 23. Capital contributions from other services within Environment Agency for projects to be carried out in 1999/2000.
- 27. Section 47 balances carried forward to 1999/2000 were £114k, £233k more than the revised budget. This represents 0.81% of gross expenditure.

FINAL ACCOUNTS 1998/99

ESSEX LOCAL FLOOD DEFENCE COMMITTEE

£000's

Line No		Outturn 1997/98	Revised Budget 1998/99	Outturn 1998/99	Variance
	A. OPERATING AND MANAGEMENT EXPENDITURE				
	Maintenance Works				
1	Main River	1543	1565	1560	(5)
2	Sea Defences	2359	2507	2495	(12)
3	Flood Warning	79	53	53	
4	Other	203	437	441	4
5	Land and Properties	2	2	2	
6	Contributions to IDBs	—	—	—	
7	Administration and General Charges	2373	2680	2684	4
8	TOTAL OPERATING MANAGEMENT EXPENDITURE	6559	7244	7235	(9)
9	Revenue Contribution to Capital Outlay	3114	3925	3738	(187)
10	Working Capital	—	30	30	
11	TOTAL EXPENDITURE	9673	11199	11003	(196)
	LESS INCOME				
12	Precepts	8698	8872	8872	
13	General Drainage Charges	495	495	496	1
14	Interest Received	400	370	385	15
15	Miscellaneous (including Land Sales)	122	150	171	21
16	TOTAL INCOME	9715	9887	9924	37
17	NET SURPLUS/(DEFICIT) TRANSFERRED TO RESERVE	42	(1312)	(1079)	233
	B. CAPITAL EXPENDITURE				
18	Grant Aided Works	4237	5760	5886	126
19	Non Grant Aided Works	366	525	385	(140)
20	Capital Salaries/Consultants Fees	627	650	667	17
21	Total Capital Expenditure	5230	6935	6938	3
	LESS				
22	MAFF Grant	2116	3010	3068	58
23	Capital Contributions	—	—	132	132
24	Revenue Contributions to Capital Outlay (in Section A above)	3114	3925	3738	(187)
	C. RESERVE				
25	i) Balance Brought Forward at 1/4/98	1151	1193	1193	
26	ii) Transfer of Operating Surplus/Deficit	42	(1312)	(1079)	
27	iii) Balance Carried Forward to 1/4/99	1193	(119)	114	233
28	Grant Earning Ceiling	3850	5700	5700	
29	Section 47 Balances				
	% of Gross Expenditure	10.08%	(0.83)	0.81%	

FLOOD DEFENCE SCHEMES

SCHEME NUMBER	SCHEME DESCRIPTION	EXPENDITURE '000
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A. GRANT ELIGIBLE EXPENDITURE

MPA20019	TILBURY BARRIER	6
MPA20124	COLNE BARRIER	14
MPA20125	COLNE BARRIER - MONITORING	30
MPA29012	ARTS PH 2	2
MPA29043	ARTS PH 3 BATCH D	18
MPA29044	ARTS PH 4 BATCH D	50
MPB20110	PARKESTON/BATHSIDE BAY PH 2 STAGE 2	100
MPB20575	BRIGHTLINGSEA TIDAL DEFENCES	97
MPB20596	CLACTON - JAYWICK TO COLNE POINT	1
MPB20598	CLACTON SEA DEFENCES	4,913
MPB20600	MILL BEACH TO GOLDHANGER	1
MPB20650	TENDRING AND HOLLAND TIDAL DEFEN	1
MPB21606	CHADWELL CROSS CULVERT	3
MPB21607	STEEPLE STONE T.D. PH 3 PHASE B	13
MPB21621	NTH.FAMBRIDGE TO ALTHORNE	494
MPB28894	SHORELINE MONITORING - 1997/98	6
MPB28895	SHORELINE MONITORING - 1998/99	99
MPB28902	SMP MODELING	36

5,886

FLOOD DEFENCE SCHEMES

SCHEME NUMBER	SCHEME DESCRIPTION	EXPENDITURE '000
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B. NON GRANT ELIGIBLE EXPENDITURE

MPB20102	HEYBRIDGE TIDAL DEFENCES PH 4	1
MPA20124	COLNE BARRIER	4
MRD21090	FORESHORE RECHARGE MONITORING	42
MRD21091	FORESHORE RECHARGE SEDIMENTS	7
MRD21092	FORESHORE RECHARGE CONSTRUCTIO	133
MPB21621	NORTH FAMBRIDGE TO ALTHORNE T.D	1
MPA29043	ARTS PH 3 BATCH D	5
MPA29044	ARTS PHASE 4 BATCH D	10
MPB20598	CLACTON SEA DEFENCES	17
MRC21096	POINT CLEAR GATES	57
MRC21900	BRIDGES RECONSTRUCTION	2
MRD21954	SALTINGS EXPERIMENTAL	37
MRD21956	ESSEX SALTINGS PROJECT	67
MRD21996	SEA DEFENCE SURVEY	28
MRD21958	CLACTON/JAYWICK EMERGENCY RECH	(26)
		385

C. SALARIES 418

D. CONSULTANTS 249 667

TOTAL CAPITAL EXPENDITURE	6,938
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