Tectonic setting of sedimentary basins

- Foreland basin
- Backarc basin
- Forearc basin
- Trench
Intracratonic sag basin  Terrestrial rift basin  Passive continental margin  Oceanic basin
Foreland basin  Backarc basin  Forearc basin  Trench
Intracratonic sag basin  Terrestrial rift basin  Passive continental margin  Oceanic basin
Foreland basin  Backarc basin  Forearc basin  Trench

Basin preservation potential

Medium
High

Low

Active ocean basins
Oceanic islands, aseismic ridges/plateaux
Remnant ocean basins
Backarc basins
Trench-slope basins
Piggyback basins
Trenches
Transpressional basins
Dormant ocean basins
Successor basins
Forearc basins
Intra-arc basins
Retroarc foreland basins
Foreland intermontane basins
Intracontinental wrench basins
Peripheral foreland basins
Transtensional basins
Transrotational basins

Aulacogens
Intracratonic basins
Continental platform
Continental rises and terraces
Continental embankments
Proto-oceanic rift troughs
Terrestrial rift valleys
Impactogens

Life-span of sediment accumulation in kMya

Low  Medium  High

Low  Medium  High

Post-sedimentation preservation potential
Arc-trench systems
Types of arc-trench system

- **CONTINENTAL MARGIN (COMPRESSIVE)**
  - Retro-arc basin
  - Inter-arc back-arc basin
  - Continental margin back-arc basin

- **CONTINENTAL MARGIN (NEUTRAL)**
  - Marginal (epicontinental) back-arc basin

- **INTRA-OCEANIC (EXTENSIONAL)**
  - Inter-arc back-arc basin
  - Continental margin back-arc basin

- **INTRA-OCEANIC (NEUTRAL)**
  - Marginal back-arc basin

**KEY**
- $T =$ Trench
- F.A.B. = Fore-arc basin
- Oceanic lithosphere
- Continental lithosphere
- Volcanic arc
Back arc basins
Back arc basins
Back arc basins
Intra-arc basins
Intra-arc basins

Back arc basins
Back-arc evolution

Stage 1

Remnant arc

Isolated pelagic facies

Hydrothermal deposit

Epiclastic/pyroclastic mass flow

Volcanic arc

SL
Back-arc basin evolution

Stage 2

Pelagic Facies

Hydrothermal Deposit

Pelagic Apron

Volcaniclastic

Epiclastic/Pyroclastic

Back arc basins
Back-arc basin evolution

STAGE 3

VELOCLASTIC APRON

HYDROTHERMAL DEPOSIT

PELAGIC FACIES

PELAGIC FACIES
Back-arc basin evolution
Back-arc basin evolution

KEY

Ocean trenches

Volcanic arcs

Active back-arc spreading

Inactive back-arc spreading

PKR = Palau-Kyushu Ridge

PVB = Parece Vela Basin

MT = Mariana Trough
Back-arc basins

STAGE 1

REMANN ARC

ISOLATED PELAGIC FACIES

HYDROTHERMAL DEPOSIT

EPICLASTIC/ PYROCLASTIC MASS FLOW

STAGE 2

PELAGIC FACIES

HYDROTHERMAL DEPOSIT

PELAGIC FACIES

VOLCANICLASTIC APRON

EPICLASTIC/ PYROCLASTIC

STAGE 3

PELAGIC FACIES

HYDROTHERMAL DEPOSIT

PELAGIC FACIES

VOLCANICLASTIC APRON

STAGE 4

EPICLASTIC/ PYROCLASTIC MASS FLOW
Back arc basins
ODP Leg 124: Joides Resolution
ODP Leg 124
Back arc basins
Back arc basins
Back arc basins

Sulu Sea
Back arc basins
Back arc basins

Sulu Sea
Back arc basins

Sulu Sea
Sulu Sea
Sulu Sea Basin: Back-arc Basin model
ODP Leg 124: Joides Resolution

Back arc basins
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